



Sinergy of Community Participation, Government Support and Environmental Awareness on Local Wisdom Based Sustainable Ecotourism Village

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Abstract

Local wisdom-based tourism plays an important role in sustainable development; however, Tomok Tourism Village in Samosir still faces challenges such as low community participation, limited government support, and a lack of environmental awareness. This study aims to analyze the roles of community participation, government support, and environmental awareness in fostering local wisdom-based sustainable ecotourism in Tomok Tourism Village, Samosir. A mixed-methods approach was employed, combining quantitative surveys of 100 respondents analyzed using SEM-PLS with qualitative interviews and field observations involving 10 informants to capture socio-cultural contexts. Quantitative results reveal that community participation has a significant and dominant effect on sustainable ecotourism (path coefficient = 0.495; p-value 0.000 < 0.05), while environmental awareness also shows a significant positive influence (path coefficient = 0.362; p-value 0.000 < 0.05). In contrast, government support, though positive in direction, does not significantly affect sustainability (path coefficient = 0.148; p-value 0.208 > 0.05). Qualitative findings reinforce these results by showing that local communities actively participate in tourism management based on a strong sense of ownership and cultural values, while government involvement is often limited to regulatory and short-term assistance. Respondents also emphasized that environmental awareness among both residents and visitors has begun to improve through collective initiatives to maintain cleanliness and reduce plastic waste. Overall, sustainable ecotourism in Tomok is primarily driven by active community involvement and environmental consciousness, while the government's role remains suboptimal. The study suggests the need to strengthen community capacity, enhance environmental education, and reposition the government's role from regulator to facilitator in achieving sustainable ecotourism.

Keywords: community participation, government support, environmental awareness, local wisdom, sustainable ecotourism

Abstrak

Pariwisata berbasis kearifan lokal memiliki peran penting dalam pembangunan berkelanjutan, namun Desa Wisata Tomok, Samosir, masih menghadapi tantangan berupa rendahnya partisipasi masyarakat, keterbatasan dukungan pemerintah, dan kurangnya kesadaran lingkungan. Penelitian ini bertujuan untuk menganalisis peran partisipasi masyarakat, dukungan pemerintah, dan kesadaran lingkungan dalam mewujudkan ekowisata berkelanjutan berbasis kearifan lokal di Desa Wisata Tomok, Samosir. Metode yang digunakan adalah pendekatan campuran (mixed methods), dengan survei kuantitatif menggunakan 100 responden yang dianalisis melalui SEM-PLS, serta wawancara dan observasi lapangan untuk memperdalam konteks sosial budaya. Hasil penelitian menunjukkan bahwa partisipasi masyarakat berpengaruh signifikan dan dominan terhadap ekowisata berkelanjutan (path coefficient = 0,495; p values 0,000 < 0,05). Kesadaran lingkungan juga berpengaruh signifikan dan positif (path coefficient = 0,362; p values 0,000 < 0,05). Sebaliknya, dukungan pemerintah meskipun berarah positif, tidak berpengaruh signifikan (path coefficient = 0,148; p values 0,208 > 0,05). Temuan ini menegaskan bahwa keberlanjutan ekowisata lebih

banyak ditentukan oleh keterlibatan aktif masyarakat dan kesadaran lingkungan, sedangkan peran pemerintah masih belum optimal. Implikasi penelitian ini menekankan pentingnya penguatan kapasitas masyarakat, pendidikan lingkungan, dan pergeseran peran pemerintah dari regulator menjadi fasilitator dalam pengelolaan ekowisata berkelanjutan.

Kata Kunci: partisipasi masyarakat, dukungan pemerintah, kesadaran lingkungan, kearifan lokal, ekowisata berkelanjutan

Received : 20-9-2025 ; Revised: 5-11-2025 ; Accepted: 20-11-2025

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<https://doi.org/10.19105/ejis.v7i2.21999>



Introduction

Tourism has become a major driver of economic growth and improved living standards in many countries, including Indonesia, where it is a national development priority. The government has designated super-priority destinations to boost key areas, including Lake Toba, a major focus in North Sumatra, recognized for its natural beauty and cultural significance to the Batak people (Indonesia, 2025). Tomok, a Tourism Village within this region, combines natural landscapes with cultural heritage, exemplified by Huta Siallagan, a traditional Batak village with ancient houses and the historic Stone Court. Despite the region's potential for ecotourism, its development remains suboptimal, with rising visitor numbers but a low average stay of 1.5 days, far below the national average of 8.75 nights (Daily, 2024);(Bisnis, 2024). Short stays limit tourism's economic impact on local revenue and community welfare, as brief visits result in lower spending on accommodation, food, and cultural experiences.

Several structural and managerial factors hinder the optimal development of Tomok as a sustainable ecotourism destination. According to the Lake Toba Tourism Development Master Plan, more than 70% of domestic tourists visiting Samosir, particularly Tomok, are one day visitors who return to Parapat on the same day (BPODT, 2021). The limited number of accommodations only about 12% of Samosir's total lodging capacity (Office, 2022) and the concentration of attractions on cultural sites like Huta Siallagan also reduce visitors' motivation to stay longer. The lack of diversified tourist activities and poor synchronization between transportation schedules and local tour services make Tomok function more as a transit point than a fully developed tourism destination (Kemenparekraf, 2023); (Yulia et al., 2024). Therefore, Tomok needs a better development strategy to increase visitor length of stay through innovative and sustainable management that integrates culture, ecology, and community based creative economy.

The challenges to achieving sustainable ecotourism in Tomok are rooted in limited community participation, inconsistent government support, and low environmental

awareness. Community involvement remains minimal, with residents largely engaged in small businesses and excluded from planning and decision making. This is due to a lack of tourism literacy and insufficient human resource capacity (Yulia et al., 2024). The absence of adequate training and information on tourism governance further limits participation, creating a dependency on external actors. Government support has been sporadic, often limited to regulations or short term aid, without effective follow up, which results in a disconnect between policy and implementation. As noted in the Lake Toba Tourism Master Plan (BPODT, 2021), the region's tourism policies are frequently top down, prioritizing infrastructure over community empowerment, leading to poor coordination among agencies. Environmental awareness is also a significant issue, with problems like waste management, plastic pollution, and irresponsible tourist behavior remaining prevalent (Fauzi et al., 2023) and (Muqsith et al., 2023). Addressing these interrelated challenges requires an integrated approach focused on economic sustainability, environmental preservation, cultural revitalization, and community empowerment.

Previous studies on ecotourism in Indonesia have largely focused on individual dimensions of sustainability rather than an integrated approach. For example, (Kia, 2021) found that local community involvement in ecotourism management is limited, often confined to operational tasks without substantial participation in planning or decision-making. (Widiartanto et al., 2022) highlighted the role of social capital in community-based ecotourism but did not examine government support or environmental awareness. (Lubis et al., 2024) emphasized the need for collaborative governance networks among communities, governments, and the private sector, but their study, focused on remote islands, did not quantitatively assess the interaction of these factors. (Utomo, 2023) proposed a local wisdom based policy model for the Tengger Ngadas community, pointing out challenges like weak coordination and limited resources, but did not develop a framework linking social, institutional, and environmental dimensions. These studies collectively show a lack of empirical research integrating community participation, government support, and environmental awareness, especially in the context of local wisdom-based ecotourism. This study addresses this gap by proposing and testing a holistic model that explores the interrelationships among these three dimensions to enhance sustainable ecotourism development at the village level.

This research examines the role of community participation, government support, and environmental awareness in promoting sustainable, local wisdom-based ecotourism in Tomok Tourism Village. The study aims to (1) analyze local community involvement in

tourism management; (2) identify government support for ecotourism development; (3) assess the impact of environmental awareness on sustainability; and (4) propose a collaborative model integrating these factors to create a more inclusive and sustainable ecotourism framework. The findings aim to offer valuable insights for tourism village managers and local governments, helping them design strategies that empower communities, enhance environmental awareness, and ensure long-term sustainability.

Method

This research used a mixed methods approach to explore the relationship between community participation, government support, and environmental awareness in promoting local wisdom-based sustainable ecotourism. The study combined quantitative and qualitative strategies: the quantitative component measured the structural relationships among variables, while the qualitative component examined social and cultural contexts not captured by numerical data. Data were collected from local communities involved in tourism, government representatives, and tourists visiting Tomok Tourism Village, Samosir. A random sampling technique was used for the quantitative survey, with at least 100 respondents for representativeness, while qualitative data were gathered through in depth interviews and field observations with 10 purposively selected informants, including community leaders, tourism actors, and government officials. This sampling ensured diverse perspectives and consistency across both datasets. The data collection, conducted from June to August 2025, aimed to achieve contextual understanding and data saturation. The demographic characteristics of the respondents are presented in the following table.

Table 1. Demographic Characteristics of Respondents

No.	Characteristics of Respondents	Category	Frequency (n)	Percentage (%)
1.	Gender	Male	54	54
		Female	46	46
		Total	100	100 %
2.	Age	17-25 Years	18	18
		26-35 Years	27	27
		36-45 Years	30	30
		> 45 Years	25	25
		Total	100	100 %
3.	Education Level	Primary School	8	8
		Secondary School	25	25
		High School	41	41
		Diploma/Bachelor's Degree	23	23
		Postgraduate Degree	3	3
		Total	100	100%

	Farmer	36	36
	Tourism Service Provider (Guide, Homestay, Craft Seller)	28	28
4. Occupation	Civil Servant/Local Government Staff	12	12
	Entrepreneur/Private Sector	14	14
	Others	10	10
	Total	100	100%
	< 5 years	6	6
	5–10 years	14	14
5. Length of Residence	11–20 years	32	32
	> 20 years	48	48
	Total	100	100%

Data collection involved distributing questionnaires for quantitative data and conducting interviews and observations for qualitative information. Quantitative data were analyzed using Smart PLS version 3, focusing on outer model analysis, inner model analysis, and hypothesis testing. Qualitative data were analyzed thematically to identify patterns and contextual insights related to community participation, government support, and environmental awareness. This integration of statistical and thematic analysis provided a comprehensive view, highlighting both numerical relationships and contextual factors, thus enriching the understanding of sustainable ecotourism development strategies in Tomok Village.

Results and Discussion

The following structural model illustrates the direction and strength of the relationships among community participation, government support, environmental awareness, and sustainable ecotourism.

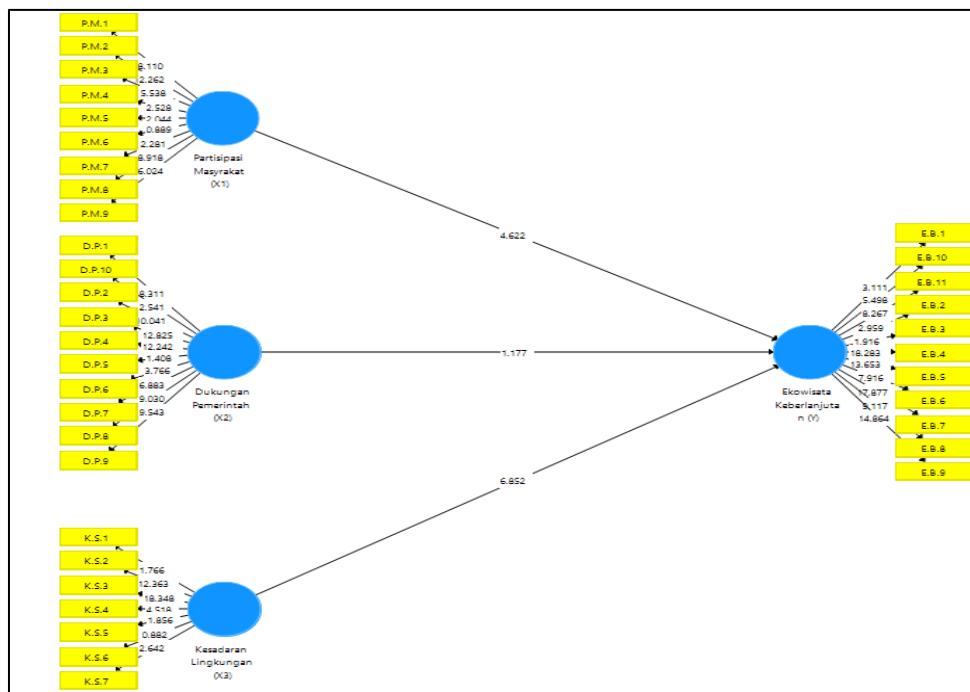


Figure 1. PLS Structural Model

There are two levels of analysis in SEM-PLS. The first is the measurement model (outer model), which includes reliability and validity testing such as construct reliability and validity, Cronbach's Alpha, and the Heterotrait-Monotrait Ratio (HTMT). The second is the structural model (inner model), which covers the assessment of R-Square and F-Square values as well as hypothesis testing (Hair et al., 2022).

Table 1. Reliability Test

Variable	Composite Reliability
Sustainable Ecotourism (Y)	0,892
Community Participation (X ₁)	0,815
Government Support (X ₂)	0,911
Environmental Awareness (X ₃)	0,794

Based on table 1. above, it shows that the composite reliability value for each variable is > 0.60 . Therefore, it can be concluded that the variables used in the research are declared reliable.

Table 2. Reliability Test

Variable	Cronbach's Alpha
Sustainable Ecotourism (Y)	0,865
Community Participation (X ₁)	0,781
Government Support (X ₂)	0,902
Environmental Awareness (X ₃)	0,805

Based on table 2 above, it shows that the Cronbach's Alpha value for each variable is > 0.7 . Therefore, it can be concluded that the variables used in the research are declared reliable.

Tabel 3. Heterotrait Monotrait Ratio (HTMT)

Variable	Government Support (X ₂)	Sustainable Ecotourism (Y)	Environmental Awareness (X ₃)	Community Participation (X ₁)
Government Support (X ₂)				
Sustainable Ecotourism (Y)	0,592			
Environmental Awareness (X ₃)	0,454	0,485		
Community Participation (X ₁)	0,818	0,769	0,497	

Based on Table 3 above, it can be seen that the correlation value between each latent variable and itself is greater than the correlation value between that latent variable and other latent variables. Thus, it can be concluded that the HTMT values have met the requirements of discriminant validity in this study.

Table 4. R-Squared Test

Variable	R Square	R Square Adjusted
Sustainable Ecotourism (Y)	0,609	0,601

Based on Table 4 above, it is shown that the Adjusted R-Square value of Sustainable Ecotourism (Y) is 0.601, which means that Community Participation (X₁), Government Support (X₂), and Environmental Awareness (X₃) influence Sustainable Ecotourism (Y) by 60.1%. Therefore, the model can be categorized as good (high).

Table 5. F-Square Test

Variable	Sustainable Ecotourism (Y)
Community Participation (X ₁)	0,287
Government Support (X ₂)	0,025
Environmental Awareness (X ₃)	0,315

This can be seen from Table 5, which shows that the effect of Community Participation (X₁) on Sustainable Ecotourism (Y) is 0.287, indicating a strong (large) effect. The effect of Government Support (X₂) on Sustainable Ecotourism (Y) is 0.025, indicating a weak (small) effect. Meanwhile, the effect of Environmental Awareness (X₃) on Sustainable Ecotourism (Y) is 0.315, which also indicates a strong (large) effect.

Table 6. Results of Direct Effect Test

Variable	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Government Support (X_2) -> Sustainable Ecotourism (Y)	0,148	0,147	0,117	1,261	0,208
Environmental Awareness (X_3) -> Sustainable Ecotourism (Y)	0,362	0,365	0,053	6,813	0,000
Community Participation (X_1) -> Sustainable Ecotourism (Y)	0,495	0,504	0,103	4,790	0,000

1. The Effect of Community Participation (X_1) on Sustainable Ecotourism. The path coefficient of 0.495 with a T-statistic value of $4.790 > 1.96$ and a p-value of $0.000 < 0.05$ indicates that community participation has a significant and positive effect on sustainable ecotourism. This means that the higher the involvement of the community in managing and developing ecotourism, the stronger the realization of sustainability in ecotourism.
2. The Effect of Government Support (X_2) on Sustainable Ecotourism. The test results show a path coefficient value of 0.148 with a T-statistic of $1.261 < 1.96$ and a p-value of $0.208 > 0.05$. This means that government support does not have a significant effect on sustainable ecotourism. Although the direction of the effect is positive, it is weak and not statistically significant.
3. The Effect of Environmental Awareness (X_3) on Sustainable Ecotourism. The path coefficient obtained is 0.362 with a T-statistic value of $6.813 (> 1.96)$ and a p-value of $0.000 < 0.05$. These results indicate that environmental awareness has a significant and positive effect on sustainable ecotourism. In other words, the higher the level of environmental awareness among the community and tourism actors, the greater its contribution to maintaining the sustainability of ecotourism.

Community Participation and Sustainable Ecotourism

Quantitative findings reveal that community participation is the most dominant factor influencing the sustainability of ecotourism in Tomok Tourism Village. The statistical analysis indicates that higher levels of local community involvement in planning, management, and monitoring activities significantly enhance economic, social, and environmental sustainability. Respondents who were actively engaged in tourism related programs such as attending planning meetings, managing attractions, or participating in environmental campaigns tended to report stronger collective benefits, better income distribution, and higher environmental awareness. These quantitative results demonstrate that community

participation is a significant predictor of sustainable ecotourism outcomes, and the qualitative findings further reinforce these results by providing contextual explanations of how and why participation contributes to sustainability. Interviews with community members reveal that involvement in tourism management is perceived not merely as a means of earning income, but as part of their cultural duty to preserve the environment and strengthen local identity. One local resident stated: "If we manage it ourselves, we can ensure the environment is preserved, because it is our source of livelihood." This statement illustrates that participation emerges from a sense of belonging and shared responsibility rather than external motivation. Other informants also highlighted that active participation increases cooperation among residents, reduces dependency on external actors, and helps resolve conflicts through local consensus.

When both sets of findings are discussed together, the results provide a comprehensive picture that integrates empirical data and lived experiences. The findings are consistent with the Community Based Tourism (CBT) framework (Lo & Janta, 2020) ;(Dangi & Jamal, 2020) which emphasizes that tourism sustainability is achieved when communities are positioned as active decision makers rather than passive beneficiaries. Moreover, the Tomok case strengthens the indigenous-based sustainability perspective proposed by (Scheyvens, 2022), which highlights that sustainable practices are deeply rooted in local wisdom and cultural values. The pattern observed in Tomok also supports (Waluyo et al., 2025) and (Aref, 2011), who found that active community involvement fosters empowerment, minimizes conflicts of interest, and enhances social cohesion. Therefore, integrating quantitative and qualitative evidence confirms that community participation in Tomok functions not only as an economic and managerial mechanism but also as a cultural and ethical foundation for sustainable ecotourism, demonstrating that sustainability cannot be achieved through structural programs alone, but must evolve from within the social and cultural fabric of the community itself.

Government Support and Sustainable Ecotourism

Quantitative findings reveal that government support does not have a significant effect on sustainable ecotourism in Tomok Tourism Village. Although the relationship is positive, the level of support provided by the government has not been strong enough to create tangible impacts on sustainability. Statistical analysis indicates that government policies and programs have limited influence on improving environmental management, community empowerment, or tourism performance. These results suggest that while

government involvement exists, its implementation has not been sufficiently effective to generate measurable outcomes. This is reinforced by qualitative evidence showing that most respondents perceived government efforts as limited to regulatory frameworks and short-term assistance without continuous facilitation or monitoring. Several interviewees pointed out that many initiatives are implemented through a top down approach that does not fully consider local needs, while others mentioned a “gap between policy and reality in the field,” where development programs are often discontinued prematurely or suffer from weak coordination. One government representative admitted that overlapping authority between local and provincial levels, combined with budget constraints, has delayed or reduced the effectiveness of several initiatives. These findings help explain why quantitative data show an insignificant statistical relationship, as communities have not yet felt meaningful or sustainable benefits from government programs.

From a theoretical perspective, these integrated findings indicate that the government’s role, while important, is not sufficient to ensure the success of sustainable ecotourism. This conclusion supports (Gössling et al., 2020), who argue that institutional structures alone cannot achieve sustainability without collaboration from local actors. It also aligns with (Eshun & Asiedu, 2023) and (Baloch et al., 2023), who found that the effectiveness of public policy depends on consistent implementation and the extent to which it empowers communities. The Tomok case enriches these insights by showing that excessive dependence on government led programs can limit innovation and weaken community initiative. Thus, in the context of Tomok, government support serves more as an enabling factor rather than a decisive driver, while long term sustainability is primarily driven by strong community participation and environmental awareness.

Environmental Awareness and Sustainable Ecotourism

Quantitative findings indicate that environmental awareness has a significant and positive effect on sustainable ecotourism in Tomok Tourism Village. Statistical analysis shows that higher levels of awareness among local communities and tourism actors are associated with better environmental management, cleaner tourist sites, and stronger support for conservation practices. This means that as environmental awareness increases, so does the community’s collective commitment to protecting natural resources and ensuring the sustainability of tourism activities. The quantitative results are supported by qualitative evidence from interviews with local tourism practitioners and visitors, who consistently emphasized the importance of maintaining cleanliness, reducing single use plastics, and protecting the natural environment. One tourism manager explained: “We

always remind visitors not to litter, because if the environment is destroyed, tourism will also die." Several residents also mentioned that environmental preservation has become part of their daily routines, such as separating waste, avoiding excessive plastic use, and planting trees around tourist areas. These testimonies confirm that environmental awareness has evolved from a mere discourse into tangible actions that reflect a shared understanding of ecological responsibility. Together, these results demonstrate that environmental awareness functions not only as an internalized attitude but also as a collective behavior that strengthens the long term sustainability of Tomok's ecotourism ecosystem.

From a theoretical standpoint, these integrated findings are consistent with the principles of sustainable development theory, which emphasize the inseparability of environmental, economic, and social dimensions in achieving long term prosperity. As (Fauzi et al., 2023) suggest, sustainability in tourism depends not only on the existence of natural attractions but also on the responsible behavior of all stakeholders who interact within it. Likewise,(Carvajal-Trujillo et al., 2024) highlight that pro environmental behavior among tourists and communities is a determining factor in shaping the success of eco destinations. The Tomok case refines these theoretical perspectives by demonstrating that environmental awareness acts as a form of social control that aligns cultural values, ecological protection, and economic benefit. It confirms that sustainability cannot be achieved if economic goals are pursued at the expense of environmental integrity; instead, long term success depends on transforming environmental awareness into everyday practices that balance human activity and nature within the local context of Tomok.

Conclusion

Based on the empirical analysis, this study concludes that community participation is the most dominant factor influencing the sustainability of ecotourism in Tomok Tourism Village. Active involvement of local communities in planning, management, and monitoring processes plays a crucial role in achieving sustainable outcomes. The higher the level of community participation, the greater the potential for developing ecotourism that integrates economic viability, social inclusiveness, and environmental responsibility. In contrast, government support does not show a significant effect on sustainable ecotourism. Although the relationship is positive, the statistical results indicate that the role of government has not yet been optimal due to limitations in policy formulation, implementation, and regulatory supervision. Meanwhile, environmental awareness exhibits a positive and significant influence on the sustainability of ecotourism. The higher the community's concern and

understanding of environmental preservation, the stronger the long-term sustainability of the tourism ecosystem. This factor serves as a fundamental pillar in maintaining harmony between human activity and the natural environment, ensuring that ecotourism development in Tomok continues to generate ecological, cultural, and economic benefits sustainably. Overall, these findings highlight that sustainable ecotourism in Tomok can be effectively achieved through a bottom up approach that strengthens community participation and environmental awareness, supported by responsive and consistent governance.

Suggestion

Based on the findings and discussions of this study, several practical implications are proposed for key stakeholders involved in the development of sustainable ecotourism in Tomok Tourism Village. First, for the government, it is crucial to shift its role from merely acting as a regulator to becoming a facilitator and catalyst for sustainable ecotourism. This can be achieved through capacity-building initiatives such as entrepreneurship training, destination management assistance, and the provision of financing access for community groups engaged in ecotourism activities. Community based policies also need to be strengthened by formulating local regulations (Perda) on sustainable tourism, granting tax incentives or subsidies for environmentally friendly businesses, and improving basic infrastructure such as road access, sanitation, and integrated waste-management facilities. In addition, cross-sectoral coordination among tourism, environmental, and creative economy agencies must be enhanced to ensure that government programs are integrated, continuous, and capable of producing tangible impacts on both community welfare and environmental preservation.

For local communities, greater active involvement in ecotourism management is strongly encouraged. Residents are expected to participate in village-level tourism planning, serve as local guides who convey indigenous knowledge, and contribute to maintaining the cleanliness, order, and safety of tourist areas. The establishment and strengthening of Tourism Awareness Groups (Pokdarwis) or similar community institutions are also essential to manage tourism attractions more effectively, promote local products, and monitor ecotourism practices to ensure compliance with sustainability principles. Strengthening social capital and collective participation will allow the community to become not only beneficiaries but also active agents of sustainable change in Tomok.

For ecotourism managers and practitioners, it is recommended that the principles of green tourism be fully integrated into operational management. Destination managers

should promote the use of renewable energy sources, implement the reduce reuse recycle (3R) concept, limit the use of single use plastics, and provide environmentally friendly facilities for visitors. Moreover, environmental and cultural education programs for tourists should be actively implemented through interpretive boards, guided tours, short workshops, and social media campaigns. Such initiatives are expected to foster collective environmental awareness and encourage more responsible tourist behavior. Overall, these recommendations are designed not only to strengthen practical implementation but also to serve as a foundation for future research and policy development on community-based sustainable ecotourism in Indonesia.

Funding & Acknowledgements

This research was funded by DRTPM, Kemdiktisaintek through the Program Penelitian Dosen Pemula (PDP) scheme, fiscal year 2025. The authors would like to express their sincere gratitude to the Kemdiktisaintek for the financial support provided, as well as to LPPM Institut Bisnis dan Komputer Indonesia for administrative assistance. Appreciation is also extended to the local government of Samosir Regency, the community of Tomok Tourism Village, and all respondents who contributed valuable insights to this study.

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