

## INTEGRATING LOCAL KNOWLEDGE AND ECOLOGICAL PRACTICES IN THE DEVELOPMENT OF COMMUNITY-BASED GEOTOURISM AT TANGKAHAN, LANGKAT

Riadi Syafutra Siregar\*<sup>1</sup>, Rona Rezky Mentari<sup>2</sup>

Sebelas Maret University<sup>1</sup>

Cendekia Nusantara Institute<sup>2</sup>

Email: [riadisyafutra@staff.uns.ac.id](mailto:riadisyafutra@staff.uns.ac.id)

### Abstract

Tangkahan, located in Langkat Regency, North Sumatra, represents a remarkable example of community-based geotourism that emerged from grassroots conservation initiatives within the Leuser ecosystem. This study examines how local knowledge, ecological ethics, and cultural practices contribute to the sustainability and authenticity of tourism activities in the region. Using ethnographic methods with including participant observation, semi-structured interviews, and community mapping. The research explores how local communities reinterpret their relationship with forests, rivers, and wildlife after shifting from logging to conservation-oriented livelihoods. The findings reveal that local ecological knowledge (LEK) and the local value of *gotong royong* (mutual cooperation) have become the moral and practical foundation for managing geotourism in Tangkahan. These cultural elements not only guide environmental stewardship but also foster collective responsibility and social cohesion among community members. Nevertheless, challenges persist as local actors negotiate between global conservation discourses, market-oriented tourism demands, and their everyday livelihood needs. Such dynamics highlight the complex interplay between ecological goals and socio-economic realities in sustaining geotourism. The study argues that integrating local worldviews and cultural frameworks into geotourism planning strengthens authenticity, participation, and resilience. Ultimately, Tangkahan demonstrates that geotourism can flourish when ecological conservation aligns with community empowerment and cultural continuity, offering a valuable model for sustainable tourism development in biodiverse tropical regions like Indonesia.

**Keywords:** Community-based; Geotourism; Cultural practices; Local ecological knowledge

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### A. INTRODUCTION

Tourism development has increasingly been positioned as a strategic instrument for promoting sustainable economic growth while simultaneously preserving ecological and cultural resources. In recent decades, scholars and practitioners have emphasized the importance of sustainable tourism models that balance environmental protection, socio-cultural integrity, and economic viability (Singh et al., 2015). Within this broader discourse, geo-tourism has emerged as an approach that emphasizes the conservation of geological and ecological heritage while promoting meaningful visitor experiences and community participation. In biodiverse regions such as Indonesia, where natural landscapes are closely intertwined with local cultural practices and traditional ecological knowledge, geo-tourism offers significant potential for sustainable regional development. The integration of ecological conservation with community participation

has become particularly relevant in rural areas where livelihoods historically depended on extractive activities such as logging, hunting, or resource exploitation (Dai et al., 2024).

At the same time, contemporary discussions on sustainable tourism increasingly highlight the role of local knowledge systems and cultural values in shaping environmental governance. Local ecological knowledge (LEK), which refers to the cumulative body of knowledge, practices, and beliefs developed by communities through long-term interaction with their environment, has been recognized as an essential component of sustainable resource management (Albuquerque et al., 2019). Studies across various ecological contexts (Haq et al., 2023; Akalibey et al., 2024; Casarrubias et al., 2025; Jendri & Mamangkey, 2025) have demonstrated that indigenous and local knowledge can provide adaptive strategies for biodiversity conservation, environmental stewardship, and climate resilience. In tourism contexts, Butler (2020) says incorporating local cultural values into tourism management can strengthen community ownership, enhance destination authenticity, and encourage collective responsibility for environmental protection. Consequently, tourism development that respects local worldviews and community institutions is more likely to produce sustainable outcomes compared to top-down development models that marginalize local actors.

Despite growing recognition of community-based approaches to tourism, many tourism initiatives in developing countries continue to face significant challenges related to environmental degradation, unequal benefit distribution and limited community participation (Aall et al., 2023; Dangi & Jamal, 2020; Moscardo, 2020). Tourism development that is driven primarily by external investors or centralized authorities often fails to integrate local knowledge and cultural values into planning and management processes. As a result (Tasci et al., 2022; Zielinski et al., 2020; Zolfani et al., 2021; Zhang & Tse, 2023), such initiatives may lead to environmental pressures, social conflicts, and loss of cultural identity within host communities. These issues highlight the need for alternative development models that prioritize community empowerment, ecological responsibility, and locally grounded knowledge systems. In this context, community-based geo-tourism has been proposed as a promising framework that places local communities at the centre of tourism governance while maintaining strong commitments to environmental conservation.

The challenge, however, lies in understanding how local communities negotiate the transition from resource-extractive livelihoods toward conservation-oriented economic activities. In many forested regions of Southeast Asia, communities historically relied on timber extraction or other forms of resource exploitation as their primary sources of income (Sutomo et al., 2024). Shifting toward conservation-based tourism therefore requires significant social, economic, and cultural transformation. This transformation involves not only changes in livelihood strategies but also reinterpretations of human relationships with nature (Fletcher et al., 2021). Understanding how local communities reconstruct ecological ethics, cultural values, and collective practices in response to tourism development is therefore essential for evaluating the sustainability of community-based tourism initiatives.

Previous studies (Wearing et al., 2020; Salazar, 2022) have suggested that the success of community-based tourism largely depends on the ability of local communities to mobilize social capital, cultural values, and traditional knowledge in managing tourism resources. Social institutions such as communal cooperation, traditional leadership structures, and collective decision-making mechanisms often play crucial roles in organizing tourism activities and distributing benefits among community members (Sari, 2024). Furthermore, local cultural practices can function as normative frameworks that regulate interactions between humans and

the environment. In many rural societies, moral values related to reciprocity, mutual assistance, and respect for nature serve as guiding principles for environmental stewardship. These cultural foundations may therefore contribute significantly to the sustainability of tourism development when they are integrated into tourism governance structures.

Another important factor emphasized in the literature is the role of ecological ethics embedded within local knowledge systems. Local communities often possess detailed knowledge of landscapes, rivers, wildlife behaviour, and seasonal environmental patterns developed through generations of interaction with their surroundings (Rasoolimanesh et al., 2020). Such knowledge enables communities to manage natural resources in ways that maintain ecological balance while supporting local livelihoods. In tourism settings, the integration of local ecological knowledge can enhance environmental interpretation, guide conservation practices and enrich visitor experiences. Moreover, when communities perceive tourism as compatible with their ecological values and cultural identities, they are more likely to actively support conservation initiatives and participate in tourism management.

Although a growing body of research has explored community-based tourism and local ecological knowledge, limited attention has been given to how these elements interact specifically within the context of geo-tourism development in tropical forest landscapes. Many studies focus primarily on economic outcomes or visitor experiences while overlooking the complex socio-cultural processes that shape community participation and environmental stewardship (Palupi et al., 2024; Okazaki, 2021). Furthermore, empirical research examining how local communities reinterpret their relationships with forests, rivers, and wildlife after transitioning from extractive economies to conservation-based tourism remains relatively scarce. This gap highlights the need for in-depth qualitative studies that explore the cultural and ecological dimensions of tourism transformation at the community level.

This study addresses these issues by examining the development of community-based geo-tourism in Tangkahan, a rural area located in Langkat Regency, North Sumatra, within the Leuser ecosystem. The research aims to analyze how local ecological knowledge, ecological ethics, and cultural practices contribute to the sustainability of tourism activities in the region. Specifically, the study investigates how local communities reinterpret their relationship with natural resources following their transition from logging-based livelihoods toward conservation-oriented tourism. The novelty of this study lies in its emphasis on the integration of local worldviews, cultural values such as *gotong royong* (mutual cooperation), and ecological knowledge within the governance of geo-tourism. The findings are expected to contribute to broader discussions on sustainable tourism and provide insights for policymakers and practitioners seeking to develop community-based geo-tourism models in biodiverse tropical regions such as Indonesia.

## **B. RESEARCH METHOD**

This study employs a qualitative research design using an ethnographic approach to examine the integration of local ecological knowledge, cultural values, and community practices in the development of community-based geo-tourism in Tangkahan, Langkat Regency, North Sumatra. An ethnographic approach is particularly appropriate for exploring social phenomena that are embedded in cultural practices, social relations, and everyday community life. Ethnography allows researchers to understand how individuals interpret their experiences and social realities within specific cultural contexts (Spradley, 2007; Creswell & Poth, 2018). In this study, the ethnographic perspective is used to explore how local communities interpret tourism

development, environmental conservation, and the management of natural resources in their daily lives.

The qualitative orientation of this research enables an in-depth exploration of social processes that cannot be adequately captured through quantitative approaches. Community-based tourism development often involves interactions among economic interests, environmental sustainability, cultural traditions, and external development influences. Understanding these dynamics requires direct engagement with community members and interpretive analysis of their experiences and social interactions (Creswell, 2014). Data were collected through several qualitative techniques, including participant observation, semi-structured interviews, and community mapping. The use of multiple data collection methods allows for triangulation of information and enhances the credibility and validity of the research findings (Creswell & Poth, 2018).

Participant observation was conducted through the researcher's direct involvement in community activities and tourism-related practices in Tangkahan. This method enabled the researcher to observe how local residents interact with visitors, manage tourism facilities, and participate in environmental conservation activities. Observations took place in various social settings such as tourism sites, community meetings, environmental activities, and informal gatherings. Field notes were systematically recorded to document social interactions, behavioral patterns, and community narratives related to tourism development and environmental stewardship (Spradley, 2007). Semi-structured interviews were conducted with selected informants, including community leaders, tourism managers, local residents, and other stakeholders involved in tourism activities. The semi-structured interview format allowed the researcher to guide the discussion using predetermined themes while providing flexibility for participants to elaborate on their perspectives and experiences. Interview topics included the history of tourism development in Tangkahan, changes in local livelihoods, the role of cultural values in community cooperation, and the use of local ecological knowledge in conservation practices (Creswell, 2014).

Community mapping was also employed as a participatory research method to understand how local residents perceive and organize their surrounding landscape. Through collaborative mapping activities, participants identified important ecological features such as forests, rivers, wildlife habitats, and tourism areas. This method helped reveal the spatial dimensions of local ecological knowledge and illustrated how community members conceptualize the relationship between natural resources, tourism activities, and conservation efforts. The data obtained from observations, interviews, and community mapping were analyzed using thematic analysis. Thematic analysis is a qualitative analytical method used to identify patterns, themes, and meanings within qualitative data (Braun & Clarke, 2006). The analysis began with the organization and transcription of field notes and interview data, followed by coding to identify key concepts related to ecological knowledge, cultural values, and community participation in tourism development.

The analytical process was conducted iteratively to refine thematic categories and to interpret the relationships between community practices, environmental conservation, and geo-tourism development. Through this analytical process, the study aims to produce a comprehensive understanding of how community-based geo-tourism in Tangkahan is shaped by local knowledge systems, cultural values, and collective environmental practices within a broader socio-ecological context.

## C. FINDINGS AND DISCUSSION

### **Transformation of livelihoods and community environmental awareness**

One of the most significant findings of this study is the transformation of local livelihoods in Tangkahan from extractive forest-based activities toward conservation-oriented tourism practices. In the past, many local residents depended on logging and forest exploitation as their primary sources of income. This livelihood pattern was closely related to the limited availability of alternative economic opportunities and the accessibility of forest resources surrounding the Leuser ecosystem. However, the gradual development of tourism in the area has encouraged a shift toward more sustainable economic activities, particularly those associated with ecotourism and community-based tourism management. Field observations and interviews reveal that this transition did not occur abruptly but evolved through a gradual process of community awareness and collective learning. Environmental degradation caused by deforestation and illegal logging led to declining forest quality, reduced wildlife populations, and the deterioration of river ecosystems (Lew et al. (2020). These ecological changes directly affected the long-term livelihood security of local communities.

As awareness of these impacts increased, community members began to explore alternative economic strategies that could simultaneously support environmental protection and local economic development. Tourism gradually emerged as one of the most viable alternatives. The natural landscape of Tangkahan—characterized by tropical forests, rivers, waterfalls, and wildlife habitats—provides strong potential for nature-based tourism. Local communities recognized that conserving these natural resources could generate sustainable economic benefits through tourism-related activities such as guiding services, accommodation, transportation, and environmental education programs. This transformation reflects a broader trend in sustainable tourism development in which communities move from resource extraction toward conservation-based economic practices (UNWTO, 2022). The transformation observed in Tangkahan also illustrates the principles of community-based tourism, where local participation plays a central role in shaping tourism development.

Studies show that active community involvement can strengthen socio-economic sustainability and increase local support for tourism initiatives (Nunkoo & Ramkissoon, 2022). In this context, tourism activities in Tangkahan are increasingly managed through community collaboration, allowing local residents to participate in decision-making processes related to tourism development and environmental conservation (Jamal & Camargo, 2022). Furthermore, the transition toward tourism-based livelihoods has contributed to strengthening environmental awareness among community members. The forest is no longer perceived merely as a source of extractive resources but as a valuable ecological asset that supports tourism activities and local prosperity. This change in perception reflects an important dimension of sustainable tourism development, where economic benefits are closely linked with environmental conservation and community empowerment (Choi & Sirakaya, 2021; Escamis & Hinlayagan, 2024).

This finding also aligns with broader discussions in the tourism literature emphasizing the importance of responsible tourism practices that balance economic development with environmental protection and community welfare (Goodwin, 2020). By shifting toward conservation-based tourism, the community of Tangkahan demonstrates how locally driven initiatives can contribute to sustainable destination management while reducing pressure on natural resources.

### **Local Ecological Knowledge in Environmental Management**

Another important finding of this study concerns the role of local ecological knowledge in shaping environmental management practices within the tourism area of Tangkahan. Local ecological knowledge refers to the accumulated understanding developed by local communities through long-term interaction with their surrounding ecosystems, including knowledge about forest dynamics, wildlife behaviour, seasonal patterns, and sustainable resource use. Such knowledge forms an important foundation for community-based environmental governance and sustainable tourism management. In Tangkahan, local ecological knowledge plays a significant role in guiding conservation practices and tourism activities. Community members possess detailed knowledge of forest ecosystems, river conditions, wildlife habitats, and medicinal plants. This knowledge is largely transmitted through intergenerational learning and daily interaction with the natural environment. As a result, ecological knowledge becomes embedded in community practices related to tourism management and environmental protection.

For example, local guides frequently rely on their ecological knowledge when accompanying visitors along forest trails. They are able to identify plant species, explain ecological functions within the forest ecosystem, and interpret wildlife behaviour for tourists. This practice not only enriches the educational value of tourism experiences but also strengthens environmental awareness among visitors and local residents. Educational interpretation is widely recognized as an important component of sustainable tourism because it promotes learning and encourages responsible environmental behaviour (Dangi & Jamal, 2020). Local ecological knowledge is also reflected in community-based environmental regulations within the tourism area. Residents understand the ecological consequences of activities such as illegal logging, wildlife hunting, and unsustainable fishing. Consequently, community agreements and local monitoring mechanisms have been developed to limit activities that may threaten ecosystem integrity. These forms of local governance illustrate how community participation can strengthen sustainable tourism management and environmental stewardship (Jamal & Camargo, 2022).

The case of Tangkahan also reflects broader transitions toward more sustainable tourism systems. Sustainable tourism transitions emphasize the importance of integrating community knowledge, environmental responsibility, and participatory governance in destination management (Escamis & Hinlayagan, 2024). In this context, local ecological knowledge functions not only as a cultural asset but also as a practical resource for sustainable tourism development. Furthermore, integrating local knowledge into tourism management supports the broader objectives of community-based tourism, where local communities play a central role in shaping tourism development while protecting ecological resources (Okazaki, 2021; Tasci et al., 2022). Studies show that community participation and local knowledge systems contribute significantly to strengthening tourism sustainability, improving environmental management, and enhancing community resilience (Zhang, Fan, & Tse, 2023). Overall, the experience of Tangkahan demonstrates that local ecological knowledge can support both conservation efforts and tourism development. By incorporating ecological knowledge into tourism interpretation, environmental management, and community governance, local communities are able to maintain ecological integrity while enhancing the authenticity and sustainability of tourism experiences.

### **Cultural Values and Collective Social Organization**

Cultural values play an important role in supporting the sustainability of community-based tourism in Tangkahan. One of the most prominent values observed in this study is the principle of

collective cooperation, commonly known in Indonesia as *gotong royong*. This value emphasizes mutual assistance, shared responsibility, and community solidarity. In the context of tourism management, *gotong royong* is reflected in collaborative activities such as maintaining tourism facilities, organizing environmental programs, and coordinating tourism services. Through these collective practices, responsibilities are distributed among community members and tourism benefits can be shared more equitably. Collective cooperation is also institutionalized through community-based tourism organizations that coordinate tourism activities in the area. These institutions serve as platforms for local decision-making, conflict resolution, and resource management. Through participatory governance structures, community members are able to contribute to planning and managing tourism activities while ensuring that local interests and environmental considerations are taken into account.

Such governance arrangements are widely recognized as a key component of sustainable tourism development, particularly in destinations where community participation plays a central role in tourism management (Scheyvens et al., 2021). The importance of social capital—including trust, shared norms, and cooperative networks—has been widely discussed in tourism studies. Strong social capital can facilitate collective action, improve coordination among stakeholders, and strengthen the capacity of communities to manage tourism resources sustainably (Wearing, McDonald, & Ponting, 2020; Nunkoo & Ramkissoon, 2022). In community-based tourism settings, these social relationships are essential for ensuring that tourism development aligns with community values and local development priorities. Research also shows that active community participation significantly influences the success of tourism initiatives. When local communities are involved in decision-making processes, tourism development tends to generate more equitable economic outcomes and stronger environmental commitments (Escamis & Hinlayagan, 2024). Participatory approaches also contribute to strengthening community resilience and long-term destination sustainability (Zhang, Fan, & Tse, 2023).

In the case of Tangkahan, strong cultural values and collective institutions provide a social foundation for sustainable tourism management. The integration of cultural traditions such as *gotong royong* with local governance structures enables the community to coordinate tourism activities, manage shared resources, and maintain environmental stewardship. This finding supports broader arguments in sustainable tourism research that emphasize the importance of community values, social capital, and participatory governance in maintaining the long-term sustainability of tourism destinations (Goodwin, 2020).

### **Tourism Development and Environmental Conservation**

Tourism development in Tangkahan is closely linked with environmental conservation initiatives. Unlike conventional mass tourism models that often prioritize economic growth over ecological sustainability, the tourism model implemented in Tangkahan emphasizes environmental protection as a central component of tourism activities. Various conservation practices have been implemented by local communities, including forest protection, wildlife monitoring, and river conservation programs (Boley, McGehee & Hammet, 2021; Choi & Sirikaya, 2021). These activities are often organized collaboratively between community members, local tourism organizations, and conservation groups. Tourism itself has become a mechanism for promoting environmental awareness. Many tourism activities incorporate educational components that introduce visitors to forest ecosystems, biodiversity conservation, and sustainable environmental practices. Local guides play an important role in communicating these environmental messages to tourists.

Research in sustainable tourism emphasizes that environmentally responsible tourism models can generate both ecological and economic benefits. Sustainable tourism practices can enhance destination resilience by balancing tourism development with environmental protection. However, tourism development also presents potential environmental risks if not managed properly. Rapid tourism growth can lead to increased waste generation, infrastructure expansion, and ecological disturbance. Studies in tourism sustainability (Lew et al., 2022; Koens et al., 2021) warn that uncontrolled tourism development can threaten fragile ecosystems and undermine conservation efforts. The case of Tangkahan demonstrates that community-based management can help mitigate such risks. By maintaining community control over tourism development and prioritizing conservation objectives, local stakeholders are better positioned to balance tourism growth with ecological sustainability.

### **Community Empowerment and Tourism Governance**

The development of community-based tourism in Tangkahan has significantly contributed to strengthening community empowerment in both economic and social dimensions. Tourism activities have created a range of new livelihood opportunities for local residents, including employment as tour guides, homestay operators, transportation providers, handicraft producers, and small-scale entrepreneurs (Mathew et al., 2021). These opportunities provide alternative income sources that reduce community dependence on environmentally destructive practices such as illegal logging or unsustainable resource extraction. By diversifying local livelihoods, tourism can enhance household economic stability and improve overall community welfare (Stone & Nyaupane, 2020). Beyond direct employment, tourism development also stimulates the growth of local micro-enterprises and service sectors. Small businesses such as food stalls, souvenir production, and local transportation services have emerged to support tourism activities. The expansion of these community-based enterprises contributes to local economic circulation and strengthens the economic resilience of rural destinations.

Research on community-based tourism indicates that locally controlled tourism enterprises can enhance economic inclusiveness by ensuring that tourism benefits remain within the community rather than being captured by external actors. Tourism development in Tangkahan has also encouraged the development of new skills among community members. Residents involved in tourism activities gradually acquire competencies in areas such as hospitality services, environmental interpretation, visitor management, and small business administration. Skill development occurs both through formal training programs and through experiential learning gained from daily interactions with visitors. Capacity-building processes such as these are widely recognized as important components of community empowerment because they increase the ability of local residents to actively participate in tourism management and benefit from tourism-related opportunities (Wearing et al., 2020).

Empowerment is also reflected in the increased participation of local residents in decision-making processes related to tourism management. Community members actively engage in discussions regarding tourism regulations, environmental protection initiatives, and the distribution of tourism benefits. Through local meetings and community forums, residents are able to express their perspectives and collectively determine strategies for managing tourism activities in the area. Participatory governance structures such as these are considered essential for ensuring that tourism development remains aligned with community interests and local priorities (Jamal & Camargo, 2022). The literature on community-based tourism consistently highlights empowerment as a key factor for achieving sustainable tourism outcomes.

Empowerment enables local communities to maintain control over tourism resources, participate in governance processes, and influence decisions affecting their livelihoods (Rastegar et al., 2021)). When communities possess greater control over tourism development, they are more likely to support tourism initiatives and actively participate in maintaining environmental sustainability (Nunkoo & Ramkissoon, 2022).

Furthermore, studies suggest that tourism initiatives that integrate community participation, environmental conservation, and cultural preservation are more likely to achieve long-term sustainability. Such integrated approaches help balance economic benefits with ecological protection and social well-being (Higgins-Desbiolles, 2021). Community-based tourism models that prioritize local empowerment and participatory governance also tend to enhance destination resilience in the face of social, economic, and environmental changes (Dodds & Butler, 2022). In the case of Tangkahan, the combination of economic opportunities, skill development, participatory governance, and strong local values has created a tourism model that reflects the principles of sustainable tourism development. Community empowerment not only improves local livelihoods but also strengthens environmental stewardship and social cohesion. This integrated model illustrates how community-based tourism can function as a mechanism for promoting sustainable rural development while maintaining ecological integrity and cultural continuity.

### **Implications for Sustainable Geo-tourism Development**

The findings of this study provide several important implications for the development of sustainable geo-tourism in biodiverse regions. First, the integration of local ecological knowledge into tourism management can significantly strengthen environmental sustainability. Local communities possess extensive knowledge of ecosystems, species behavior, and natural resource dynamics that can support effective conservation practices. When incorporated into tourism interpretation and environmental management, this knowledge not only contributes to ecosystem protection but also enhances the educational and experiential value of tourism activities.

Second, cultural values and local social institutions play a crucial role in supporting collective resource management. Cultural traditions that emphasize cooperation, mutual responsibility, and community solidarity provide a social foundation for sustainable tourism governance. Tourism initiatives that build upon existing cultural norms and social networks are more likely to gain community legitimacy and long-term support. In this context, social capital and local institutions function as mechanisms that facilitate coordination, conflict resolution, and collective action in tourism management. Third, community empowerment represents a key condition for ensuring that tourism development generates equitable benefits while maintaining environmental sustainability. Empowerment enables local communities to actively participate in decision-making processes related to tourism planning, resource management, and benefit distribution. Through participatory governance structures, communities are able to maintain a degree of control over tourism activities and adapt management strategies in response to environmental, social, and economic changes.

Finally, the case of Tangkahan demonstrates that community-based geo-tourism can serve as an effective model for integrating conservation and development objectives in biodiversity-rich regions. By combining ecological protection, cultural values, and active community participation, tourism development can simultaneously contribute to environmental conservation and local economic improvement. This integrated approach highlights the importance of aligning tourism initiatives with local knowledge systems and community-based governance mechanisms. Overall,

the experience of Tangkahan reinforces the growing recognition that sustainable tourism development must be grounded in local participation, ecological awareness, and culturally embedded management practices. In regions characterized by high biodiversity and strong cultural traditions—such as the Leuser ecosystem—community-based geo-tourism offers a promising pathway for promoting inclusive, resilient, and environmentally responsible tourism development.

#### D. CONCLUSION

This study examined the development of community-based geo-tourism in Tangkahan, Langkat Regency, North Sumatra, with particular attention to the roles of local ecological knowledge, cultural values, and community participation in supporting sustainable tourism management. The findings reveal that the emergence of tourism in Tangkahan has transformed local livelihoods from extractive forest-based activities toward conservation-oriented economic practices. Previously, many residents depended on logging and other forms of forest exploitation for their income. However, the growth of tourism has created alternative livelihood opportunities such as tour guiding, homestay management, transportation services, and small-scale local enterprises. These economic alternatives have reduced community dependence on environmentally destructive activities while improving household income and local economic resilience.

The study also highlights the importance of cultural values in sustaining community-based tourism. The principle of *gotong royong*, which emphasizes collective cooperation and mutual responsibility, plays a central role in organizing tourism activities and managing shared resources. Through community cooperation and local institutions, residents collectively maintain tourism facilities, coordinate tourism services, and participate in environmental protection initiatives. These social mechanisms strengthen community cohesion and support participatory governance in tourism management. The findings suggest that sustainable geo-tourism development in biodiverse regions should prioritize the active involvement of local communities. Policies supporting tourism development should recognize the value of local ecological knowledge and incorporate it into conservation strategies, tourism interpretation, and environmental education programs.

Despite providing valuable insights, this study has several limitations. The research focuses primarily on a single case study in Tangkahan, which may limit the generalizability of the findings to other tourism destinations. Future research could conduct comparative studies across multiple community-based tourism destinations to better understand variations in governance structures, cultural dynamics, and sustainability outcomes. In addition, further studies may explore the long-term environmental impacts of tourism activities and examine how community-based tourism models adapt to changing economic, environmental, and policy conditions.

#### REFERENCES

- Aall, C., Dodds, R., Sælensminde, I., & Brendehaug, E. (2023). Introducing the concept of sustainable tourism transitions. *Journal of Sustainable Tourism*, 31(1), 1–20. <https://doi.org/10.1080/09669582.2021.1910280>
- Albuquerque, U. P., Nascimento, A. L. B., Chaves, L. S., Feitosa, I. S., Moura, J. M. B., Gonçalves, P. H. S., Da Silva, R. H., Silva, T. C., Júnior, W. S. F., & Araújo, E. L. (2019). How to partner with people in ecological research: Challenges and prospects. *Perspectives in Ecology and Conservation*, 17(3), 144–150. <https://doi.org/10.1016/j.pecon.2019.11.004>

- Akalibey, S., Hlaváčková, P., Schneider, J., Fialová, J., Darkwah, S., & Ahenkan, A. (2024). Integrating indigenous knowledge and culture in sustainable forest management via global environmental policies. *Journal of Forest Science*, 70(4), 187–198. <https://doi.org/10.17221/20/2024-jfs>
- Boley, B. B., McGehee, N. G., & Hammett, A. L. (2021). Importance–performance analysis (IPA) of sustainable tourism initiatives: The resident perspective. *Tourism Management*, 84, 104248. <https://doi.org/10.1016/j.tourman.2020.104248>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Butler, R. W. (2020). Overtourism and sustainable tourism development. *Tourism Recreation Research*, 45(2), 273–278. <https://doi.org/10.1080/02508281.2019.1650581>
- Casarrubias, C., López, J., Alviso, C., Bello, M., & Salinas, S. (2025). Community environmental leadership and sustainability: Building knowledge from the local level. *Sustainability*, 17(8), 3626. <https://doi.org/10.3390/su17083626>
- Choi, H. C., & Sirakaya, E. (2021). Sustainability indicators for managing community tourism. *Tourism Management Perspectives*, 37, 100776. <https://doi.org/10.1016/j.tmp.2020.100776>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications.
- Dai, H., Zhu, Z., Trachung, B., Golog, D., Riley, M., Lü, Z., & Li, L. (2024). Communities in ecosystem restoration: The role of inclusive values and local elites' narrative innovations. *People and Nature*. <https://doi.org/10.1002/pan3.10675>
- Dangi, T. B., & Jamal, T. (2020). An integrated approach to sustainable community-based tourism. *Sustainability*, 12(3), 1022. <https://doi.org/10.3390/su12031022>
- Dodds, R., & Butler, R. (2022). *Overtourism: Issues, realities and solutions*. De Gruyter.
- Escamis, J. E., & Hinlayagan, K. R. (2024). Community-based tourism implementation as mediator on the relationship between community participation and socio-economic sustainability of tourism. *American Journal of Tourism and Hospitality*, 2(1), 93–104. <https://doi.org/10.54536/ajth.v2i1.3629>
- Fletcher, R., Murray Mas, I., Blanco-Romero, A., & Blázquez-Salom, M. (2021). Tourism and degrowth: An emerging agenda for research and praxis. *Journal of Sustainable Tourism*, 29(12), 1937–1957. <https://doi.org/10.1080/09669582.2020.1860042>
- Goodwin, H. (2020). *Responsible tourism: Using tourism for sustainable development* (2nd ed.). Goodfellow Publishers.
- Haq, S., Pieroni, A., Bussmann, R. W., Abd-ElGawad, A., & El-Ansary, H. O. (2023). Integrating traditional ecological knowledge into habitat restoration: Implications for meeting forest restoration challenges. *Journal of Ethnobiology and Ethnomedicine*, 19(1). <https://doi.org/10.1186/s13002-023-00606-3>
- Higgins-Desbiolles, F. (2021). The “war over tourism”: Challenges to sustainable tourism in the tourism academy after COVID-19. *Journal of Sustainable Tourism*, 29(4), 551–569. <https://doi.org/10.1080/09669582.2020.1803334>
- Jamal, T., & Camargo, B. (2022). Tourism governance and community participation in sustainable destinations. *Annals of Tourism Research*, 92, 103338. <https://doi.org/10.1016/j.annals.2021.103338>
- Jendri, S., & Mamangkey, J. (2025). Mapping the knowledge landscape of local and traditional ecological knowledge (LEK/TEK) in mangrove ecosystems: A bibliometric analysis in the past decade. *International Journal of Science, Technology & Management*, 6(5). <https://doi.org/10.46729/ijstm.v6i5.1360>
- Koens, K., Postma, A., & Papp, B. (2021). Is overtourism overused? Understanding the impact of tourism in a city context. *Sustainability*, 13(1), 342. <https://doi.org/10.3390/su13010342>

- Lew, A. A., Cheer, J. M., Haywood, M., Brouder, P., & Salazar, N. B. (2020). Visions of travel and tourism after the global COVID-19 transformation. *Tourism Geographies*, 22(3), 455–466. <https://doi.org/10.1080/14616688.2020.1770326>
- Mathew, P. V., Sreejesh, S., & Kuriakose, V. (2021). Community participation in sustainable tourism development: Evidence from India. *Journal of Hospitality and Tourism Management*, 46, 1–10. <https://doi.org/10.1016/j.jhtm.2020.11.001>
- Moscardo, G. (2020). The importance of education and learning in sustainable tourism. *Journal of Sustainable Tourism*, 28(2), 171–190. <https://doi.org/10.1080/09669582.2019.1690498>
- Nunkoo, R., & Ramkissoon, H. (2022). Residents' support for tourism development: A review of the literature. *Journal of Travel Research*, 61(5), 1013–1032. <https://doi.org/10.1177/00472875211018548>
- Okazaki, E. (2021). A community-based tourism model: Its conception and use. *Journal of Sustainable Tourism*, 29(8), 1239–1258. <https://doi.org/10.1080/09669582.2020.1800557>
- Palupi, S., Pradana, G. Y. K., & Yudana, I. M. (2024). Integration of community-based tourism packages to realize a sustainable tourism village. *E-Journal of Tourism*, 11(1), 153–165. <https://doi.org/10.24922/eot.v11i1.111366>
- Rasoolimanesh, S. M., Ramakrishna, S., Hall, C. M., Esfandiar, K., & Seyfi, S. (2020). A systematic scoping review of sustainable tourism indicators. *Journal of Sustainable Tourism*, 28(9), 1337–1355. <https://doi.org/10.1080/09669582.2020.1729915>
- Rastegar, R., Higgins-Desbiolles, F., & Ruhanen, L. (2021). COVID-19 and a justice framework to guide tourism recovery. *Annals of Tourism Research*, 91, 103161. <https://doi.org/10.1016/j.annals.2021.103161>
- Salazar, N. B. (2022). Community-based cultural tourism: Issues, threats and opportunities. *Tourism Recreation Research*, 47(3), 321–333. <https://doi.org/10.1080/02508281.2021.1884476>
- Sari, I. N. (2024). Realizing sustainable rural tourism through community-based tourism (CBT): A SWOT analysis of Curug Dhuwur Waterfall. *Jurnal Bisnis Kehutanan dan Lingkungan*, 2(1), 17–30.
- Scheyvens, R., Movono, A., & Auckram, S. (2021). Pacific peoples and tourism: Exploring cultural values in sustainable tourism development. *Tourism Geographies*, 23(4), 643–664. <https://doi.org/10.1080/14616688.2019.1709880>
- Singh, S., Gopal, N., John, S., Xavier, H., & Kumar, S. (2025). Sustainable tourism practices: Balancing economic growth and environmental conservation. *Journal of Information Systems Engineering and Management*. <https://doi.org/10.52783/jisem.v10i4.9751>
- Spradley, J. P. (2007). *Participant observation*. Waveland Press.
- Stone, M. T., & Nyaupane, G. P. (2020). Ecotourism influence on community needs and the environment. *Journal of Ecotourism*, 19(2), 107–123. <https://doi.org/10.1080/14724049.2019.1663671>
- Sutomo, Y. A. W., Sianipar, C. P. M., Onitsuka, K., & Hoshino, S. (2024). Evaluating policy environment for community-based rural tourism: Multi-actor perspectives in tourism value chains. *Journal of Regional and City Planning*, 35(3), 223–238.
- Tasci, A. D. A., Semrad, K. J., & Yilmaz, S. S. (2022). Community-based tourism and sustainability: A systematic literature review. *Journal of Sustainable Tourism*, 30(5), 1185–1206. <https://doi.org/10.1080/09669582.2020.1864385>
- Wearing, S., McDonald, M., & Ponting, J. (2020). Building community capacity in tourism development. *Tourism Management Perspectives*, 33, 100603. <https://doi.org/10.1016/j.tmp.2019.100603>
- Zhang, J., Fan, D., & Tse, T. S. M. (2023). Tourism sustainability and resilience in rural destinations. *Journal of Destination Marketing & Management*, 27, 100760. <https://doi.org/10.1016/j.jdmm.2022.100760>

- Zielinski, S., Kim, S., Botero, C., & Yanes, A. (2020). Factors that facilitate and inhibit community-based tourism initiatives in developing countries. *Current Issues in Tourism*, 23(6), 723–739. <https://doi.org/10.1080/13683500.2018.1543254>
- Zolfani, S. H., Sedaghat, M., Maknoon, R., & Zavadskas, E. K. (2021). Sustainable tourism: A comprehensive literature review. *Sustainability*, 13(4), 2211. <https://doi.org/10.3390/su13042211>