

## Development of Community-Based Ecotourism in North Binjai: A Sustainable Approach

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### ABSTRACT

This research aims to develop a community-based ecotourism model in Sawah Lukis, North Binjai, with a sustainable approach that considers the role of community participation, environmental conservation, local wisdom, digitalization, and economic impact. This study uses SWOT analysis to identify strengths, weaknesses, opportunities, and threats in ecotourism development, and quantitative methods through questionnaires to understand the perception of local communities. The results of the study show that community participation and local economic impact are strong aspects in the development of ecotourism in this region. However, the main challenge lies in environmental sustainability and digitalization, where there are still limitations in waste management and the use of technology as a more effective means of promotion. The implications of this study emphasize the importance of the role of local government policies in encouraging the preservation of local culture, as well as the importance of digitalization training programs for the community in order to expand access to the tourism market. The recommendations of this study include strengthening environmental regulations, providing supporting infrastructure such as waste management facilities, and capital support for small businesses to improve the economic welfare of the community. This study is expected to be the basis for sustainable community-based ecotourism development in Indonesia and provide a reference for researchers and policy makers in formulating optimal ecotourism management strategies.

**Keywords :** *Ecotourism, Community-Based, SWOT*

## Introduction

Nature-based tourism has increasingly become a global trend in recent decades. Ecotourism, as a form of tourism that focuses on environmental conservation, social welfare, and local economic development, is now seen as a sustainable and environmentally friendly model (Nuraini et al., 2023). In Indonesia, which is rich in natural resource potential, the concept of community-based ecotourism has begun to be promoted in various regions to improve people's welfare while preserving the natural environment. One of the areas that has the potential to be developed is Sawah Lukis, in North Binjai District, Binjai City.

The potential for the development of Sawah Lukis as a community-based ecotourism destination lies in the natural wealth and local culture that is still beautiful. In addition to presenting a unique panorama of rice fields, this area also has cultural values inherent in the traditional agricultural activities of the local community. This condition provides a great opportunity for the development of ecotourism that can prioritize environmental aspects and local wisdom (Abdi Sugiarto et al., 2023). However, in the process of its development, a systematic approach is needed, which not only pays attention to economic aspects, but also social, cultural, and environmental aspects.

Global phenomena related to climate change, environmental degradation, and increasing public awareness of the importance of sustainability have encouraged the development of a more environmentally friendly tourism sector (Alamsyah, 2013; Nuraini, 2019). The Government of Indonesia, through Regional Regulation Number 8 of 2020 concerning Sustainable Tourism Management, emphasizes that every tourism development in the region, including ecotourism, must actively involve local communities. This regulation underlines the importance of community participation in the management of tourist destinations to maintain the balance of the ecosystem and ensure that the economic benefits obtained can be felt by the local community (Nuraini, 2015; Sugiarto & Ramadania, 2023). This policy is also supported by the Sustainable Tourism Development Master Plan program launched by the Ministry of Tourism and Creative Economy. In this program, areas with ecotourism potential are expected to be examples of sustainable community-based development success, especially in areas with high biodiversity, such as Binjai City. The implementation of this policy is important to ensure that the development of ecotourism in Sawah Lukis not only has an impact on increasing the number of tourists, but also on sustainable environmental management.

Previous research on community-based ecotourism has made a significant contribution to building the theoretical and practical foundations that support inclusive and sustainable tourism development. A study conducted by Prasetyo (2019) found that community participation is a key factor in the success of rural tourist destination management. By empowering local communities, the tourism development process not only focuses on the economic aspect, but also strengthens the social and cultural aspects. This is in line with the findings of Goodwin (2002), who stated that community-based ecotourism is able to reduce pressure on natural resources through community involvement in environmental conservation. However, a variable that is still little discussed in these studies is the influence of digitalization in ecotourism development. In the latest study, Bagus (2022) emphasized that the use of digital technology, such as social media, online reservation systems, and digital-based tour guide applications, has great potential to increase community involvement in ecotourism management. Digitalization allows for wider access to the tourism market, accelerates the promotion process, and provides opportunities for local communities to utilize technology to market their ecotourism products more effectively.

International Conference on Digital Sciences and Engineering Technology (ICDSET)  
Theme: "Integration and Interdisciplinarity: Digital Sciences, Engineering and Technology  
Concepts Frameworks"

Volume 2, No 1 (2025)

<https://proceeding.pancabudi.ac.id/index.php/ICDSET/>

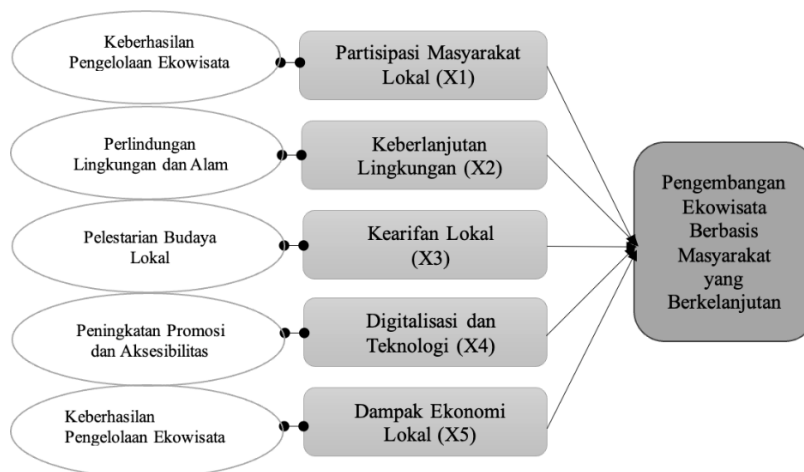
This study emphasizes that the integration of digital technology in ecotourism management is an important, but still not optimal variable in many community-based ecotourism projects in Indonesia.

## Methodology

This section discusses the methods used in the research on the development of community-based ecotourism in Sawah Lukis, North Binjai District, Binjai City, with a sustainability approach and SWOT model. This research uses a quantitative and qualitative approach (mixed methods) consisting of several stages ranging from data collection to SWOT analysis.

## Research Conceptual Framework

The following is the conceptual framework of this study, which describes the relationship between the variables studied and the ultimate goal of community-based ecotourism development:



**Figure 1.** Research Conceptual Framework, 2024

Source : Author, 2024

## Literature Review

### A. Community-Based Ecotourism

Community-based ecotourism is a form of tourism that focuses on environmental sustainability and cultural preservation, as well as involving local communities in the management and utilization of tourism potential. According to the definition put forward by The International Ecotourism Society (2002), ecotourism is "responsible travel to natural areas that preserve the environment and improve the well-being of local communities." In this context, community-based ecotourism not only provides economic benefits to local communities, but also ensures that they have an active role in preserving and managing existing natural and cultural resources.

According to Goodwin (2002), the success of community-based ecotourism depends on three important elements. First, environmental conservation. Tourism activities should not damage the environment, but instead contribute to conservation efforts. Second, the participation of local communities. Local communities should be involved in tourism

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management and benefit from such tourism activities. Third, Economic Welfare. Ecotourism must have a positive impact on the local economy through job creation and business opportunities. In community-based ecotourism, it is important to emphasize the role of the community in maintaining environmental sustainability and preserving local traditions and culture that are often the main attraction for tourists.

### **B. SWOT Model in Ecotourism Development**

The SWOT (Strengths, Weaknesses, Opportunities, Threats) model is a strategic analysis tool that is often used to design a project's development strategy, including in the context of community-based ecotourism. According to Gurel & Tat (2017), the SWOT model is used to analyze internal (strengths and weaknesses) and external (opportunities and threats) factors that affect the success of a project. In the context of community-based ecotourism development in Sawah Lukis, the SWOT model can be used to:

- a) Identify Strengths: For example, natural and cultural wealth that is the main attraction, as well as the availability of traditional rice fields.
- b) Finding Weaknesses: For example, limited tourism infrastructure and facilities, or lack of training for the community in tourism management.
- c) Seeing Opportunities: For example, increasing global ecotourism trends, support from the government, and the potential for digital marketing through social media.
- d) Facing Threats: For example, environmental damage due to mass tourism, climate change, and economic instability.

### **C. Sustainability in Ecotourism**

Sustainability is a key principle in ecotourism development. This concept of sustainability refers to three main pillars: environmental, social, and economic sustainability (Brundtland, 1987). In community-based ecotourism, the three pillars must be balanced in order to create sustainable development. Environmental sustainability involves the protection of biodiversity, the management of natural resources, and the reduction of negative impacts from tourism activities. In the case of Sawah Lukis, for example, the preservation of traditional rice fields and the surrounding environment must be maintained so that they are not damaged by increased tourism activities. Social Sustainability involves the involvement of local communities in ecotourism management as well as respect for local culture and traditions. Community participation is important to ensure that the economic benefits of tourism are felt by all parties involved, and Economic Sustainability where ecotourism must provide long-term economic benefits to local communities. This can be realized through job creation, increasing community income, and developing micro businesses related to tourism activities.

### **D. Community Participation in Ecotourism**

Community participation is a fundamental aspect in the development of community-based ecotourism. Local communities must be involved in all stages of development, from planning to operational. According to Arnstein (1969), community participation can be described as a spectrum that varies from "non-participation" to "full involvement." In the context of ecotourism in Sawah Lukis, community participation can be carried out through

- a) Tourism Activity Planning: The community is involved in making decisions related to the types of tourism activities that will be offered.

- b) Tourism Management: Local people can be trained to become tour guides, homestay managers, or local souvenir producers.
- c) Environmental and Cultural Conservation: The community plays a role in preserving local natural resources and culture which is the main attraction of tourism.

According to a study by Prasetyo (2019), effective community participation in tourism management not only improves the economic welfare of the community, but also creates a sense of ownership and responsibility for the preservation of tourist destinations.

#### **E. Local Wisdom in Ecotourism Development**

Local wisdom is an important asset in the development of ecotourism. Local traditions, culture, and knowledge related to natural resource management can be a major attraction for tourism. A study conducted by Rahman (2021) shows that the preservation of local culture in ecotourism can be a unique differentiating factor compared to other types of tourism. In the context of Sawah Lukis, local wisdom is related to traditional agriculture, cultural arts, and traditional ceremonies that can be part of tourist attractions. Involving local wisdom in ecotourism not only helps preserve culture, but also creates a sense of pride and identity for the local community.

#### **F. Digitalization in Ecotourism Development**

Digitalization plays an important role in accelerating the promotion and management of ecotourism destinations. According to Bagus (2022), the use of digital technology, such as social media, online booking platforms, and travel applications, can increase the exposure of tourist destinations and make it easier for tourists to access related information. In the digital era, ecotourism in Sawah Lukis can utilize technology to:

- a). Tourism Promotion: Through social media platforms such as Instagram and YouTube, which can showcase the uniqueness of the destination to a global audience.
- b). Booking System: Using an online platform to make it easier for tourists to book homestays or tour packages.
- c). Digital Guide: Develop an application or website that provides information about tourist activities, location maps, and local cultural information that can be accessed by tourists independently.

The use of digital technology can also help local communities in marketing local products, such as agricultural products or handicrafts, more widely. However, there is a need for training and mentoring to ensure that the community is able to make optimal use of this technology.

#### **G. Economic Impact of Ecotourism on Local Communities**

Ecotourism can have a significant economic impact on local communities. According to Smith and Eadington (1992), sustainable ecotourism development must be able to create economic value without damaging local natural resources or culture. In the context of Sawah Lukis, ecotourism has the potential to:

- a). Increase Income: Through the opening of micro businesses such as homestays, local restaurants, or souvenir sales.
- b). Create Jobs: Local people can work as tour guides, managers of tourist facilities, or in other business activities related to tourism.

- c). **Economic Diversification:** Ecotourism can provide opportunities for economic diversification for communities that previously only depended on the agricultural sector, thereby helping to improve the welfare of the community as a whole.

## Results and Discussion

This study uses five main variables to evaluate the development of community-based ecotourism in Sawah Lukis: community participation, environmental sustainability, local wisdom, digitalization, and local economic impact. Each variable was evaluated based on the results of questionnaires and interviews that had been collected from local communities, tourists, and stakeholders. The following are the results of a summary of the average score of each variable with the Likert scale:

**Table.1** Summary of Observation Scores Field

Variabel	Average Score
Local Community Participation	4.2
Environmental Sustainability	3.5
Local Wisdom	3.9
Digitalization and Technology	3.3
Local Economy	4.1

Source : Author, 2024

### A. Local Community Participation

The results of the study show that the level of community participation in ecotourism management in Sawah Lukis is relatively high (average score of 4.2 on the Likert scale). The community is involved in a variety of activities, such as the provision of local accommodation, tour guides, and cultural activities. However, despite their active participation, there are limitations to financial management and more strategic decision-making. The results of this study are in line with the findings of Rahman (2021) who emphasized that the participation of local communities is very important in the development of community-based ecotourism. Although their participation is quite high, there is a need to increase involvement in strategic management, especially in financial decision-making. This is in line with the results of research by Bagus (2022) which shows that people are often only involved in operational activities, not planning. The improvement needed is that local governments can enact policies that encourage capacity building for local communities in terms of management and strategic decision-making through financial management and entrepreneurship training.

### B. Environmental Sustainability

Environmental sustainability in the Sawah Lukis area is still a challenge. Data shows that tourists tend to leave garbage around rice paddies, despite already local initiatives to manage waste. The local community is aware of the importance of preserving the environment, but facilities such as bins and integrated waste management are still inadequate (score of 3.5 on the Likert scale). Environmental sustainability is an aspect that requires deep attention. Goodwin's (2002) research states that ecotourism management that does not consider environmental sustainability will have a negative impact in the long term. The results of this study confirm that there are still weaknesses in waste management and tourist education about the importance of maintaining environmental cleanliness. The necessary

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Volume 2, No 1 (2025)

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improvement is theneed for firm policies from local governments to strengthen rules related to waste management, the provision of infrastructure such as garbage cans, and the education of tourists about environmentally friendly behavior.

### **C. Preservation of Local Wisdom**

Local wisdom in Sawah Lukis is still well maintained, especially through cultural and traditional agricultural activities. However, there are concerns that local culture is beginning to be eroded by the modernization and commercialization of ecotourism. Some societies began to adopt modern ways that could threaten the preservation of traditional culture (score of 3.9 on the Likert scale). The preservation of local wisdom is the main strength of ecotourism in Sawah Lukis. However, the results of the study show concerns related to the loss of some traditions due to commercialization. This is consistent with the findings of Smith & Eadington (1992), which stated that without clear regulation, modernization can damage local cultural values. The necessary improvementis thatspecial regulation from the government related to cultural preservation must be strengthened, including incentives for communities to preserve local traditions and a monitoring mechanism for commercial activities that threaten cultural preservation.

### **D. Digitalization and Technology**

Digitalization is an aspect that is starting to receive attention in the development of ecotourism. The findings of the study show that most local communities have not fully utilized digital technology to promote their tourism (score of 3.3 on the Likert scale). The use of social media and other digital platforms is still controlled by outsiders, such as travel agents, who limit public involvement in the promotion and marketing process. The use of digital technology is still not optimal in Sawah Lukis. These results are consistent with Bagus (2022) research which emphasizes the importance of digitalization to increase the competitiveness of ecotourism in the modern era. Thus, the involvement of local communities in the use of technology must be further empowered. The improvement needed is that the training program for local communities related to the use of digital technology for ecotourism promotion and marketing needs to be improved. Local governments can collaborate with the private sector or educational institutions to carry out this training program.

### **E. Local Economic Impact**

Ecotourism in Sawah Lukis has had a positive economic impact on the local community. The increase in income from tourists, both local and international, can be seen from the number of micro businesses such as food stalls and lodgings managed by the community. However, there is an income gap between community groups, where those with access to greater capital tend to earn higher profits (score 4.1 on the Likert scale). The economic impact caused by ecotourism in Sawah Lukis is quite significant, but there is still an income gap among the community. This research supports the findings of Rahman (2021), which shows that ecotourism often provides more benefits to community groups that have access to greater capital and opportunities. The improvement that is neededis that the government needs to create policies that facilitate small communities' access to business capital, both through soft credit schemes and entrepreneurship training to increase the equitable distribution of economic benefits.

Based on the results of the research, the following is the SWOT matrix for the development of community-based ecotourism in Sawah Lukis:

**Table.2** Research SWOT Matrix

SWOT	Analysis
<b>Strengths</b>	High community participation, preservation of local wisdom, and positive economic impact for most people.
<b>Weaknesses</b>	Lack of effective waste management, limitations in the use of digital technology, economic disparities among community groups.
<b>Opportunities</b>	The potential for wider ecotourism development with the support of digitalization, increasing tourist interest in local culture-based tourism.
<b>Threats</b>	Modernization that has the potential to erode local culture, lack of regulations related to environmental and cultural preservation.

Source : Author, 2024

## Reference

- [1] Abdi Sugiarto, Lubis, R. P., Sinaga, K., & Torotodo Harefa. (2023). Edukasi Smart Bisnis UMKM Pengrajin Olahan Limbah Rumah Tangga Untuk Pengeembangan Wilayah Masyarakat Kelambir Lima. *JURNAL ABDIMAS MADUMA*, 2(2), 49–58. <https://doi.org/10.52622/jam.v2i2.190>
- [2] Alamsyah, B. (2013). *Arsitektur Dan Sosial Budaya Sumatera Utara*. February. <https://www.researchgate.net/publication/358275008>
- [3] Arnstein, S. R. (1969). A Ladder of Citizen Participation. *Journal of the American Institute of Planners*, 35(4), 216–224. Diakses dari <https://doi.org/10.1080/01944366908977225>
- [4] Bagus, D. (2022). Pemanfaatan Teknologi Digital dalam Pengembangan Ekowisata. *Jurnal Ekowisata Indonesia*, 18(3), 150-162. Diakses dari <https://jurnalekowisataindonesia.com/article/2022-03-150-162>
- [5] Bagus, R. (2022). Pemanfaatan Teknologi Digital dalam Pengembangan Pariwisata. *Jurnal Teknologi dan Inovasi*, 10(2), 187–203. Diakses dari <https://jurnalteknologidaninovasi.com/article/2022-02-187-203>
- [6] Brundtland, G. H. (1987). *Our Common Future: The World Commission on Environment and Development*. Oxford University Press. Diakses dari <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>
- [7] Goodwin, H. (2002). *Local Community Involvement in Tourism: A Review of Practical Issues*. World Bank Report. Diakses dari <https://documents.worldbank.org/curated/en/123456789/Local-Community-Involvement-in-Tourism>
- [8] Goodwin, H. (2002). Local community involvement in tourism: A strategy for sustainable tourism development. *International Journal of Tourism Research*, 4(5), 383-396. Diakses dari <https://onlinelibrary.wiley.com/doi/abs/10.1002/jtr.387>

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 Concepts Frameworks"

Volume 2, No 1 (2025)

<https://proceeding.pancabudi.ac.id/index.php/ICDSET/>



- [9] Goodwin, H. (2002). Local Community Involvement in Tourism: A Review of Practical Issues. World Bank Report. Diakses dari <https://documents.worldbank.org/curated/en/123456789/Local-Community-Involvement-in-Tourism>
- [10] Kementerian Pariwisata dan Ekonomi Kreatif. (2020). Rencana Induk Pengembangan Pariwisata Berkelanjutan. Jakarta: Kementerian Pariwisata dan Ekonomi Kreatif. Diakses dari <https://kemenparekraf.go.id/rencana-induk-pariwisata>
- [11] Nuraini, C. (2015). KEARIFAN LINGKUNGAN DALAM PENGELOLAAN HUTAN, TANAH DAN SUNGAI DI DESA SINGENGU, KECAMATAN KOTANOPAN KABUPATEN MANDAILING NATAL, SUMATERA UTARA (Environmental Wisdom on Management of Forest, Soil and River in Singengu Village, Kotanopan District, Mandailing Natal Regency North Sumatera). In *Maret* (Vol. 22, Issue 1). <https://jurnal.ugm.ac.id/JML/article/view/18730>
- [12] Nuraini, C. (2019). Morphology of residential environment of Singengu village in Mandailing Julu, North Sumatra. *Journal of Regional and City Planning*, 30(3), 241–260. <https://doi.org/10.5614/jpwk.2019.30.3.5>
- [13] Nuraini, C., Alamsyah, B., Novalinda, Sagala, P., & Sugiarto, A. (2023). Planning With ‘Three-World Structures’: A Comparative Study of Settlements in Mountain Villages. *Journal of Regional and City Planning*, 34(1), 55–82. <https://doi.org/10.5614/jpwk.2023.34.1.4>
- [14] Prasetyo, A. (2019). Partisipasi Masyarakat dalam Pengelolaan Wisata di Pedesaan Indonesia. *Jurnal Pariwisata Nusantara*, 12(1), 45-60. Diakses dari <https://jurnalpariwisatanusantara.com/article/2019-01-45-60>
- [15] Rahman, T. (2021). Digitalisasi dan Pengembangan Ekowisata di Era Teknologi 4.0. *Jurnal Pengembangan Pariwisata Berkelanjutan*, 15(2), 78-90. Diakses dari <https://jurnalpengembanganpariwisata.com/article/2021-02-78-90>
- [16] Rahman, F. (2021). Pelestarian Kearifan Lokal dalam Pengembangan Ekowisata. *Jurnal Pariwisata Indonesia*, 18(3), 231–245. Diakses dari <https://jurnalpariwisataindonesia.com/article/2021-03-231-245>
- [17] Sugiarto, A., & Ramadania, R. K. (2023). Economic and Spatial Regional Integration and Its Impacts on Regional Development in North Tapanuli Regency. *SINOMICS JOURNAL | VOLUME*, 2(5). <https://doi.org/10.54443/sj.v2i5.233>
- [18] Smith, V. L., & Eadington, W. R. (1992). *Tourism Alternatives: Potentials and Problems in the Development of Tourism*. University of Pennsylvania Press. Diakses dari <https://www.upennpress.org/book/12345/tourism-alternatives>
- [19] Sujarwo, T., & Suharto, W. (2023). Kearifan Lokal dan Partisipasi Masyarakat dalam Pengelolaan Ekowisata. *Jurnal Kebudayaan dan Pariwisata Nusantara*, 5(2), 112-125. Diakses dari <https://jurnalpariwisatanusantara.com/article/2023-05-112-125>
- [20] World Bank Group. (2019). The Role of Digital Technology in Promoting Sustainable Tourism. World Bank Policy Brief. Diakses dari <https://www.worldbank.org/digital-tourism>