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Developing Tourism Products in an Emerging Ecotourism Village: Integrating ECOS and Doxey's Irritation Index

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Abstract*:* This study was conducted due to the emerging condition of Harangan Girsang Paradise Ecotourism Village, which has recently been developed and still experiences low tourist visits, indicating the need for appropriate tourism product development strategies. This study aimed to evaluate the condition of tourism products, analyze community attitudes toward tourism development, and formulate appropriate development strategies. The study employed a descriptive qualitative and quantitative (mixed-methods) approach. Data were collected through observation, in-depth interviews with the 1 tourism village management, documentation, literature review, and questionnaires distributed to 18 community members and 18 visitors. The data were analyzed using qualitative analysis and descriptive statistics. The Ecotourism Opportunity Spectrum (ECOS) and Recreation Zone Index (RZI) were used to evaluate the conditions of tourism products, while Doxey's Irritation Index was applied to analyze community attitudes. The findings indicated that tourism products were in the eco-generalist category, whereas community attitudes were at the euphoria stage, reflecting strong support for tourism development. Based on these findings, the recommended strategies include strengthening nature- and culture-based tourism products, improving human resource capacity, enhancing community participation, managing tourism impacts, and implementing gradual and sustainable promotion. These findings highlight the importance of integrating tourism product conditions and community attitudes in developing sustainable ecotourism destinations.

Keywords: community attitudes, ecotourism opportunity spectrum, irritation index, tourism products

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INTRODUCTION

Tourism has become a strategic sector in driving economic growth, creating employment opportunities, and strengthening regional cultural identity (Elyanta, Dalimunthe, Kamal, et al., 2024); (Noina et al., 2024); (Armayadi et al., 2025); (Setyaningsih, 2025). However, within the framework of sustainable development, tourism is no longer solely oriented toward increasing visitor numbers but also toward maintaining a balance between economic, environmental, and socio-cultural dimensions (Akay, 2022); (Sudini & Arthanaya, 2022); (Ardhiatma, 2025). In this

context, ecotourism has emerged as an important approach that integrates environmental conservation, cultural preservation, and community empowerment. Recent studies have emphasized that sustainable tourism development requires not only resource-based attractiveness but also strong community involvement and adaptive management strategies (Nafi et al., 2017); (B, 2019); (Wang et al., 2024); (Noina et al., 2024); (Elyanta, Dalimunthe, Hutahaean, et al., 2024); (Ardhiatma, 2025); (Talib et al., 2025).

Harangan Girsang Paradise Ecotourism Village, located in Simalungun Regency, North Sumatra, represents an emerging tourism destination developed under the ecotourism concept. The village only began receiving visitors during the Eid al-Fitr period in 2025, indicating that it is still in the early stages of development. This condition presents both opportunities and challenges. On the one hand, the destination possesses significant natural potential, including protected forests, waterfalls, biodiversity, and panoramic views of Lake Toba. On the other hand, it also offers strong cultural attractions such as traditional Batak cuisine (*itak gurgur* and *sasagun*) and traditional dance performances. These characteristics reflect the fundamental components of tourism products, including attractions, amenities, accessibility, and hospitality, which are essential for destination competitiveness (Ching et al., 2019); (Ratliff & Kunz, 2020); (Rahmawati & Sumbawati, 2025); (Hulfa & Anggriana, 2025); (Suryadana & Octavia, 2015).

Despite its relatively low number of tourist visits due to its recent establishment, the destination has developed basic tourism facilities and diversified attractions that provide a foundation for future tourism growth. Challenges such as inadequate promotion, limited infrastructure development, and the absence of integrated tourism packaging hinder the optimal utilization of its resources. Previous research has shown that newly developed tourism destinations often face similar constraints, particularly in aligning resource potential with market demand and management capacity (Azmi et al., 2023); (Muluneh et al., 2022); (Jørgensen et al., 2024); (Kovács & Szabó, 2024). Moreover, the success of tourism development is not only determined by physical resources but also by the attitudes and participation of local communities, which play a crucial role in ensuring sustainability (Lijun & Ahmed, 2024); (Melese et al., 2026); (Chan et al., 2021); (Manggaprouw et al., 2025); (Baraq et al., 2025).

To address these challenges, this study applies the Ecotourism Opportunity Spectrum (ECOS) framework developed by (Boyd & Butler, 1996) to evaluate tourism product conditions based on seven key variables, including access, other resource-related activities, attractions offered, existing infrastructure, social interaction, level of skill and knowledge, and acceptance of visitor impacts. The ECOS framework has been widely used in recent studies to assess the suitability and development stage of ecotourism destinations (Salici, 2018); (Sebastian, 2023); (Indrayani & Jumanah, 2023); (Nasution et al., 2023); (Fattah et al., 2021). In addition, this study incorporates Doxey's Irritation Index to analyze community attitudes toward tourism development, which categorizes attitudes into four stages: euphoria, apathy, irritation, and antagonism (Doxey, 1975). Recent empirical studies have confirmed the relevance of this model in understanding community responses in emerging tourism destinations (Akdu & Ödemiş, 2018); (Setiawan et al., 2020); (Banjarnahor et al., 2024); (Apollo & Cheer, 2024).

Although previous studies have applied either the Ecotourism Opportunity Spectrum (ECOS) to evaluate tourism product conditions or Doxey's Irritation Index to assess community attitudes, these frameworks have generally been used separately. ECOS evaluates the physical and environmental conditions of tourism products, whereas Doxey's Irritation Index explains community attitudes toward tourism development. Using either framework alone provides only

a partial understanding of tourism development. Therefore, this study integrates both models to evaluate tourism product conditions and community attitudes simultaneously, providing a more comprehensive basis for formulating sustainable tourism product development strategies.

Based on this context, this study aims to evaluate the condition of tourism products, analyze community attitudes toward tourism development, and formulate appropriate tourism product development strategies in Harangan Girsang Paradise Ecotourism Village. The findings are expected to provide an integrated framework for sustainable tourism planning that balances tourism product conditions and community attitudes in emerging ecotourism destinations.

METHOD

This study employed a mixed-methods approach, combining descriptive qualitative and quantitative methods to obtain a comprehensive understanding of tourism product conditions and community attitudes in Harangan Girsang Paradise Ecotourism Village. The Ecotourism Opportunity Spectrum (ECOS) framework was used to evaluate tourism product conditions, while Doxey's Irritation Index was applied to assess community attitudes toward tourism development.

Data were collected from visitors, local communities, and one key informant. Quantitative data were obtained through questionnaires using accidental (convenience) sampling, whereby respondents were selected based on their availability and willingness to participate during the field survey. Visitor questionnaires were administered to individuals who had experienced tourism activities at Harangan Girsang Paradise, while community questionnaires were distributed to local residents actively involved in tourism-related activities.

Since the exact population size was unknown, the sample size was determined using the Linear Time Function (LTF) method (Indrayani & Jumanah, 2023); (Alam, 2019), resulting in 18 visitor respondents and 18 local community respondents (36 respondents in total). The visitor group was used to evaluate tourism product conditions through the ECOS framework and the Recreation Zone Index (RZI), whereas the local community group was used exclusively to measure community attitudes using Doxey's Irritation Index. Considering that Harangan Girsang Paradise is an emerging ecotourism destination with a limited number of visitors and active tourism stakeholders, and that this study employed descriptive rather than inferential analysis, the sample was considered adequate to describe existing tourism product conditions and community attitudes, with the quantitative findings further strengthened through field observations and in-depth interviews.

$$\mathrm{n} = \frac{T - t_0}{t_1}$$

$$\mathrm{n} = \frac{900 - 720}{10} = 18$$

Description:

n : Number of samples

T : Total time available for the study (3 days × 5 hours × 60 minutes)

t_0 : Time allocated for sampling (3 days × 4 hours × 60 minutes)

t_1 : Time required for each respondent sampling (10 minutes)

Qualitative data were collected through field observations, documentation, literature review, and in-depth interviews with the Head of the Harangan Girsang Paradise Ecotourism Management Group, who was selected purposively because of his central role in planning, managing, and coordinating tourism development in the village. The qualitative component was

designed to complement and validate the quantitative findings by providing contextual information on tourism product development and community participation, rather than to achieve broad representation of stakeholder perspectives.

Qualitative data were analyzed using the interactive model of Miles and Huberman, including data reduction, data display, and conclusion drawing. Quantitative data were analyzed using descriptive statistics, including means and percentages (Sugiyono, 2018).

The condition of tourism products was evaluated using the Recreation Zone Index (RZI) within the Ecotourism Opportunity Spectrum (ECOS) framework (Boyd & Butler, 1996)by assessing seven variables: access, other resource-related activities, attractions offered, existing infrastructure, social interaction, level of skill and knowledge, and acceptance of visitor impacts.

The analysis was conducted in three main stages. First, the questionnaire was developed by the researchers, with each of the seven ECOS variables operationalized into 15 questionnaire items. Each item was evaluated using a three-point rating scale representing the ECOS spectrum. A score of 0 was assigned when the observed condition corresponded to the characteristics of an eco-specialist destination. A score of 1 represented the intermediate category, and a score of 2 was assigned when the condition reflected an eco-generalist destination. The scoring criteria for each ECOS variable were adapted directly from the indicators proposed by (Boyd & Butler, 1996), as presented in table 1:

Table 1. Scoring Criteria for the Ecotourism Opportunity Spectrum (ECOS) Variables

Variable	Eco-specialist (0)	Intermediate (1)	Eco-generalist (2)
Access	Difficult access; trails; waterways	Moderate access	Paved roads; easy transportation
Other Resource-Related Activities	Limited compatibility	Moderate compatibility	Compatible with larger-scale tourism
Attractions Offered	Mainly natural attractions	Natural and cultural attractions	Diverse natural, cultural, and supporting attractions
Existing Infrastructure	No facilities	Basic facilities	Complete tourism facilities
Social Interaction	Minimal interaction	Moderate interaction	Frequent interaction with local community
Level of Skill and Knowledge	Professional/ecotourism experts	Moderate knowledge	General visitors requiring interpretation
Acceptance of Visitor Impacts	Very low impact	Moderate impact	High impact with visitor management

Second, the score for each ECOS variable was calculated by multiplying the rating scale value by the number of questionnaire items and the number of respondents.

$$x = \text{Rating Scale Value} \times \sum \text{question items} \times \sum \text{respondents}$$

Since each variable consisted of 15 items assessed by 18 respondents, the maximum possible score for each variable was 540 (2 x 15 x 18). The maximum score was then divided into three equal intervals (540/3 = 180), resulting in the following ECOS classification criteria:

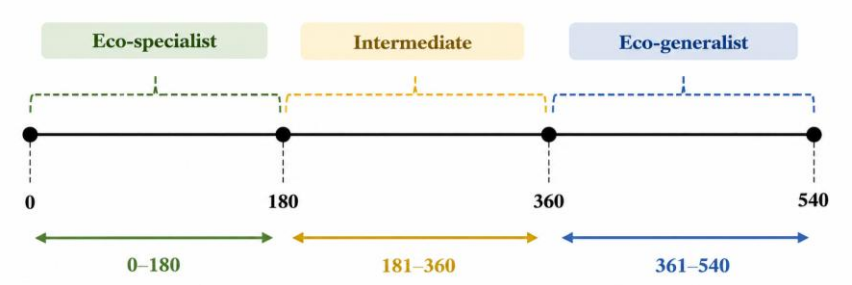

Figure 1. ECOS Maximum Score Classification

Third, the Recreation Zone Index (RZI) was calculated using:

$$RZI = \sum \frac{N_i}{N_{max}} \text{ x } 100\%$$

where N_i represents the total score of the seven variables, and N_{max} is the maximum possible score. The RZI results were interpreted based on ECOS criteria: eco-specialist (0–33.33%), intermediate (33.34–66.66%), and eco-generalist (>66.67%).

Community attitudes were measured using Doxey's Irritation Index (Doxey, 1975), which consists of four stages: euphoria, apathy, irritation, and antagonism. The questionnaire comprised nine statements, with items 1–2 representing the euphoria stage, items 3–5 representing apathy, items 6–7 representing irritation, and items 8–9 representing antagonism. The mean score for each stage was calculated, and the stage with the highest mean score was interpreted as the dominant community attitude.

Data validity was ensured through triangulation of sources and methods to confirm the consistency and credibility of the findings. Overall, these procedures formed a coherent analytical framework capable of addressing the research objectives and producing valid and reliable conclusions.

RESULTS AND DISCUSSION

Research Results

Tourism Product Conditions in Harangan Girsang Paradise Ecotourism Village

The implementation of this research aimed to evaluate tourism product conditions using the Ecotourism Opportunity Spectrum (ECOS) and Recreation Zone Index (RZI) as benchmarks for determining the level of development. The indicators used to assess the achievement of research objectives included access, other resource-related activities, attractions offered, existing infrastructure, social interaction, the level of skill and knowledge, and acceptance of visitor impacts. The success of tourism product development was measured by the classification of ECOS categories, namely eco-specialist, intermediate, and eco-generalist.

The findings showed that Harangan Girsang Paradise Ecotourism Village possesses both natural and cultural attractions. Natural attractions include protected forests, waterfalls, biodiversity, and panoramic views of Lake Toba, while cultural attractions consist of traditional Batak dance (Tor-Tor) and local culinary products such as *itak gurgur*, *sasagun*, and *kecombrang syrup*. Supporting facilities such as toilets, prayer rooms, disaster-mitigation signage, pedestrian paths, viewing towers, and culinary kiosks have been developed to enhance the visitor experience. Accessibility to the site was considered highly adequate, with paved roads and easy access by both private and public transportation.

Figure 2. Several Natural and Cultural Attractions in Harangan Girsang Paradise Ecotourism Village

Figure 3. Several Supporting Facilities in Harangan Girsang Paradise Ecotourism Village

The evaluation based on ECOS indicators revealed that most variables, including access, other resource-related activities, attractions offered, existing infrastructure, social interaction, and acceptance of visitor impacts, were categorized as eco-generalist, indicating that the destination has developed basic tourism facilities and services. However, the variable of the level of skill and knowledge was categorized as intermediate, suggesting that the human resource capacity remains an area requiring improvement.

Table 2. ECOS Variable Score and Classification Results

Variable	Rating Scale Value	Score Value	Indicator
Access	2	540	eco-generalist
Other Resource-Related Activities	2	540	eco-generalist
Attractions Offered	2	540	eco-generalist
Existing Infrastructure	2	540	eco-generalist
Social Interaction	2	540	eco-generalist
Level of Skill and Knowledge	1	270	intermediate
Acceptance of Visitor Impacts	2	540	eco-generalist
Total	13	3510	

Table 2 presents the score calculation for each ECOS variable. The Rating Scale Value represents the ECOS category assigned to each variable (0 = eco-specialist, 1 = intermediate, and 2 = eco-generalist). The Score Value was obtained by multiplying the rating scale value by the 15 questionnaire items and 18 respondents, resulting in a maximum score of 540 for variables classified as eco-generalist and 270 for variables classified as intermediate. The total observed score of all seven ECOS variables was 3510, while the maximum possible score was 3780 (7 × 540). These values were subsequently used to calculate the Recreation Zone Index (RZI) using the following formula:

$$\text{RZI} = \sum \frac{\text{Ni}}{\text{N max}} \text{ x } 100\%$$

$$\text{RZI} = \frac{3510}{3780} \text{ x } 100\%$$

$$\text{RZI} = 92{,}85\%$$

The overall RZI calculation resulted in a score of 92.85%, which falls within the eco-generalist category (>66.67%). This result indicates that the tourism products already exhibit the characteristics of an eco-generalist destination in terms of accessibility, attraction diversity, infrastructure, and social interaction, although the destination itself is still at an early stage of tourism development with relatively low visitor numbers.

The findings demonstrate that the achievement of tourism product development is primarily supported by strong natural and cultural resources, adequate accessibility, and basic infrastructure availability. However, the relatively moderate level of human resource competence suggests that further capacity-building initiatives are necessary to optimize tourism management.

Community attitudes toward tourism product development

This study analyzed community attitudes toward tourism product development using qualitative and quantitative approaches. Qualitative data were obtained through field observations and interviews with tourism village management, while quantitative data were collected through questionnaires administered to local residents. Community attitudes were assessed using Doxey's Irritation Index, which classifies residents' perceptions into four stages: euphoria, apathy, irritation, and antagonism. The dominant stage was determined based on the highest stage mean score.

The results of qualitative data collection showed that the local community demonstrated a highly positive and proactive attitude toward tourism development. This condition was reflected in strong environmental awareness, where the transformation of forest areas into ecotourism destinations was perceived as a collective effort to prevent illegal logging and protect natural ecosystems. Community participation was also evident through the practice of *haroan bolon* (mutual cooperation), where residents actively contributed to the infrastructure development and maintenance. In addition, the community demonstrated openness by integrating local culture into tourism activities, particularly through traditional dance performances and local culinary products. These findings indicate that tourism is not only viewed as an economic opportunity but also as a means of environmental conservation and cultural revitalization.

The quantitative results are presented in Table 3, which shows the mean score for each questionnaire item and the average score for each stage of Doxey's Irritation Index.

Table 3. Item Level Results of Community Attitudes Based on Doxey's Irritation Index

Stage	Questionnaire Item	Mean
Euphoria	I warmly welcome tourists visiting the village.	4.00
	Tourism planning in the village is still limited.	2.50
	Stage Mean	3.25
Apathy	I consider the presence of tourists as something normal.	3.11

	My relationship with tourists is mainly commercial.	2.06
	Tourism planning mainly emphasizes marketing.	2.22
	Stage Mean	2.46
Irritation	I feel disturbed by the presence of tourists.	1.00
	Tourism planning improves infrastructure without limiting growth.	3.06
	Stage Mean	2.03
Antagonism	I openly dislike the presence of tourists.	1.00
	I consider tourists a source of problems.	1.00
	Stage Mean	1.00

The item-level results show that the euphoria stage recorded the highest mean score (3.25), followed by apathy (2.46), irritation (2.03), and antagonism (1.00). The highest individual score was obtained for the statement "I warmly welcome tourists visiting the village" (mean = 4.00), indicating a high level of community acceptance toward visitors. In contrast, the two antagonism statements each received the lowest mean score (1.00), demonstrating that residents do not perceive tourists as a source of problems and do not reject tourism development. Overall, these findings indicate that the local community remains in the euphoria stage, reflecting strong support for tourism development in Harangan Girsang Paradise Ecotourism Village.

Tourism product development strategies

This study aimed to formulate tourism product development strategies through a series of research activities, including data collection, analysis, and synthesis of findings. The activities were carried out by integrating the results of field observations, interviews, and questionnaire analysis into a strategic framework. The indicators used to achieve this objective are based on the results of assessing the condition of the tourism product and community attitudes. The benchmark for determining the success of the research activities was the formulation of comprehensive and applicable strategies that support sustainable tourism development.

The interview with the Head of the Harangan Girsang Paradise Ecotourism Management Group confirmed the questionnaire findings, particularly regarding the village's strong natural and cultural tourism potential, the need to improve local human resource capacity, and the positive support of local communities for tourism development. These qualitative findings were consistent with the ECOS and Doxey analyses and complemented the field observations, thereby strengthening the credibility of the study through methodological triangulation. The integration of these qualitative and quantitative findings served as the basis for formulating the proposed tourism product development strategies.

Based on these findings, five strategic priorities were identified. First, strengthening nature- and culture-based tourism products by integrating forests, waterfalls, panoramic landscapes, traditional Batak culinary products (*itak gurgur* and *sasagun*), and Tor-Tor cultural performances into experience-based tourism packages, including nature trekking, environmental interpretation, traditional culinary experiences, and scheduled cultural performances.

Second, enhancing human resource capacity and destination management through ecotourism guide training, visitor service training, destination management, environmental safety management, and institutional strengthening of local tourism organizations to improve professional destination management.

Third, strengthening local community participation by involving residents in tourism planning, management, and the provision of tourism products, including local culinary businesses, cultural performances, and nature guiding. Community participation was further reinforced through the local value of *haroan bolon* (mutual cooperation) and greater involvement of young people in cultural preservation activities.

Fourth, managing tourism impacts and visitor control through the establishment of visitor regulations based on environmental carrying capacity, activity zoning, interpretation boards, and the implementation of low-impact tourism principles. Although visitor numbers remain relatively low, these measures were identified as preventive actions to maintain environmental and socio-cultural sustainability as tourism grows.

Finally, implementing gradual and sustainable promotion strategies by utilizing digital media, word-of-mouth marketing, and collaboration with local government, academic institutions, and tourism communities. Promotional activities emphasize the destination's identity as a community-based ecotourism village that integrates natural and cultural resources while maintaining sustainability principles.

Overall, the results demonstrate that the proposed strategies are directly derived from the ECOS and Doxey analyses, ensuring that tourism product development addresses both tourism product conditions and community attitudes toward tourism product development. These integrated strategies provide an operational framework for supporting the sustainable development of Harangan Girsang Paradise Ecotourism Village.

Discussion

The findings of this study demonstrate that tourism product conditions, community attitudes, and tourism development strategies are closely interconnected in Harangan Girsang Paradise Ecotourism Village. Based on the Ecotourism Opportunity Spectrum (ECOS), the destination was classified as an eco-generalist, supported by a high Recreation Zone Index (RZI). This classification indicates that the destination has reached a relatively advanced stage of development, characterized by adequate accessibility, infrastructure, and diverse tourism attractions.

The classification should not be interpreted as indicating that the destination has reached a mature stage of tourism development in terms of visitor numbers or market performance. Rather, the eco-generalist category reflects the characteristics of the tourism products assessed through the ECOS framework, including access, other resource-related activities, attractions offered, existing infrastructure, social interaction, the level of skill and knowledge, and acceptance of visitor impacts. Therefore, although Harangan Girsang Paradise is an emerging ecotourism destination with relatively low visitor numbers, its tourism products already exhibit the characteristics of an eco-generalist destination.

According to (Boyd & Butler, 1996), eco-generalist destinations are generally more open to broader visitor segments and are often visited by tourists traveling in larger groups through organized ecotourism packages. These visitors usually prefer a certain level of comfort and tourism infrastructure, which may increase pressure on the host culture and environment. Consequently, destinations in this category face challenges in maintaining ecological balance while accommodating tourism growth. This finding is consistent with studies by (Indrayani &

Jumanah, 2023) and (Sebastian, 2023), who emphasize that destinations in this category possess strong development potential but require controlled and well-planned management to ensure sustainability.

The integration of forests, waterfalls, Lake Toba landscapes, Batak culinary products, and Tor-Tor performances reflects the core principles of ecotourism by combining conservation, education, and community empowerment (Tiani & Baiquni, 2018);(Carp & Romita, 2023); (Mokodongan, 2024). Consistent with previous studies (Siringoringo et al., 2024); (Azimi et al., 2026);(Tewari, 2024);(Jumadi et al., 2025);(Ghalami et al., 2026);(Van Houten, 2025); (Ismatillaevna et al., 2023); (Firdaus et al., 2025); (Sugita et al., 2025); (Jurowski, 2010), this integration enhances visitor experiences and destination competitiveness. In line with (Boyd & Butler, 1996),eco-generalist tourists value both natural and cultural attractions; therefore, experience-based tourism products provide an effective approach to strengthening destination attractiveness while supporting sustainable ecotourism.

Despite these strengths, the ECOS analysis identified knowledge and skills as the only variable remaining at the intermediate level, indicating that human resource capacity has not kept pace with tourism product development. Similar findings were reported by (Armayadi et al., 2025) and (Abdurakhmanova & Ahrorov, 2025), who emphasized the importance of competent local stakeholders for sustainable ecotourism. Consistent with (Boyd & Butler, 1996),eco-generalist visitors rely heavily on guides and interpretation services, highlighting the need for guide certification, interpretation training, and institutional capacity building.

The analysis of community attitudes provides further depth to the interpretation of tourism development in the study area. The dominance of the euphoria stage indicates that local communities strongly support tourism development and are willing to participate actively in tourism activities. Similar findings have been reported in Indonesia and other countries (Setiawan et al., 2020); (Akdu & Ödemiş, 2018); (Hien et al., 2024); (Banjarnahor et al., 2024); (Pardede et al., 2024), although the present study demonstrates stronger community ownership through *haroan bolon*, tourism management groups, and cultural performances.

However, this positive attitude should not be interpreted as permanent. According to (Doxey, 1975), residents' attitudes may gradually shift from euphoria toward apathy, irritation, and antagonism if tourism impacts are not managed effectively. This finding is supported by (Wijaya, 2026), who demonstrated that communities in Bali experienced such a transition due to unequal benefit distribution, environmental degradation, inappropriate tourist behaviour, unmanaged solid waste, congestion, and weak policy implementation. Similar challenges may emerge in Harangan Girsang Paradise Ecotourism Village as visitor numbers increase if tourism development is not carefully planned and monitored. These findings suggest that proactive destination management, equitable benefit distribution, environmental conservation, and community participation are essential to prevent negative attitude shifts as tourism develops.

Another important finding of this study is that environmental awareness emerged as a primary driver of community support. Unlike many tourism destinations where economic motives dominate, the community in Harangan Girsang Paradise Ecotourism Village perceives tourism as a tool for environmental conservation, particularly in preventing illegal logging. This finding supports the argument by (Akgun et al., 2026); (Tarino & Purnomo, 2024); (Erdawati & Ayub, 2024); and (Scheyvens, 1999) that ecotourism can empower local communities when it aligns with their environmental and socio-cultural values. It also suggests that community attitudes are influenced not only by economic benefits but also by ecological and cultural motivations, which strengthens long-term sustainability.

A major theoretical contribution of this study is the integration of the Ecotourism Opportunity Spectrum (ECOS) and Doxey's Irritation Index into a single analytical framework. ECOS evaluates the physical and environmental conditions of tourism products, whereas Doxey's model explains community attitudes toward tourism development. Used separately, each framework provides only a partial understanding of tourism development. By integrating both perspectives, this study offers a more comprehensive framework for analyzing tourism products and formulating sustainable tourism development strategies. This integrated framework is reflected in the findings, where Harangan Girsang Paradise Ecotourism Village exhibited eco-generalist tourism product characteristics while the local community remained in the euphoria stage, enabling development strategies that simultaneously address destination quality and community support.

The integrated findings provide a clear basis for formulating five strategic priorities for sustainable tourism product development. First, the eco-generalist classification indicates that the destination already possesses relatively well-developed natural and cultural tourism resources. Therefore, these resources should be integrated into experience-based tourism products, including nature trekking, environmental interpretation, traditional culinary experiences (itak gurgur and sasagun), and scheduled Tor-Tor cultural performances, to enhance visitor experiences while maintaining the principles of ecotourism (Nafi et al., 2017); (Akdu & Ödemiş, 2018); (Wang et al., 2024).

Second, the ECOS analysis identified the level of skill and knowledge as the only variable remaining in the intermediate category. This finding indicates that human resource capacity has not yet matched the development of tourism products. Consequently, priority should be given to ecotourism guide certification, interpretation training, destination management, and institutional strengthening to improve service quality and long-term destination management (Demirovic et al., 2017); (Indrayani & Jumanah, 2023); (Tilavova et al., 2024); (Silalahi & Khadry, 2024); (Khadry & Silalahi, 2024); (Noina et al., 2024); (Hatani et al., 2024); (Kasmin, 2025); (Tarino & Purnomo, 2024).

Third, the Doxey analysis showed that the community remains in the euphoria stage, indicating strong local support for tourism development. This favourable condition provides an opportunity to strengthen community participation through local culinary enterprises, community-based homestays, youth involvement in cultural activities, and collaborative tourism planning based on the local value of haroan bolon (Wijaya, 2026).

Fourth, although the community currently demonstrates positive attitudes toward tourism, Doxey's model suggests that these attitudes may shift toward apathy and irritation if tourism impacts are not properly managed. Therefore, preventive visitor management should be implemented through visitor zoning, carrying-capacity monitoring, interpretation boards, environmental education, and low-impact tourism practices to minimize future environmental and social impacts (Tiani & Baiquni, 2018);(Noina et al., 2024).

Finally, despite the destination's eco-generalist tourism product characteristics, Harangan Girsang Paradise remains an emerging ecotourism destination with relatively low visitor numbers. Therefore, promotion should be implemented gradually through digital marketing, word-of-mouth promotion, and partnerships with government agencies, academic institutions, and tourism communities to increase destination visibility while ensuring that tourism growth remains consistent with the area's environmental carrying capacity (Aminullah & Rahmasari, 2025); (Rahmadani, 2026).

Practically, the integrated ECOS–Doxey framework provides a decision-support tool for policymakers and destination managers by ensuring that tourism planning simultaneously considers tourism product conditions and community attitudes. Village tourism managers and tourism awareness groups (Pokdarwis) should prioritize guide training, interpretation programs, and the development of experience-based tourism products that integrate nature and Batak culture. Local governments and tourism offices should support carrying-capacity assessments, visitor management, infrastructure improvements, and digital promotion. Community groups should strengthen local culinary products, cultural performances, and community-based tourism enterprises, while academic institutions can contribute through research, capacity building, and monitoring the environmental and socio-cultural impacts of tourism development. These collaborative efforts provide an operational basis for sustainable tourism product development by integrating tourism product conditions with community attitudes in emerging ecotourism destinations.

CONCLUSIONS

This study concludes that Harangan Girsang Paradise Ecotourism Village is classified as an eco-generalist destination based on the Ecotourism Opportunity Spectrum (ECOS), indicating that the destination has relatively well-developed tourism products supported by adequate accessibility, infrastructure, and diverse natural and cultural attractions. Community attitudes were positioned at the euphoria stage according to Doxey's Irritation Index, reflecting strong local support for tourism development and a favorable social environment for sustainable destination management.

Based on these findings, five strategic priorities were identified. First, tourism products should be strengthened by integrating forests, waterfalls, the Lake Toba landscape, Batak traditional culinary products, and Tor-Tor cultural performances into experience-based tourism packages. Second, human resource capacity should be enhanced through ecotourism guide certification, interpretation training, destination management, and institutional strengthening of community-based tourism organizations. Third, local community participation should be reinforced by expanding community-based tourism enterprises, promoting *haroan bolon* (mutual cooperation), and increasing youth involvement in tourism and cultural preservation. Fourth, preventive visitor management should be implemented through visitor zoning, carrying-capacity monitoring, interpretation boards, environmental education, and low-impact tourism practices. Finally, gradual and sustainable promotion should emphasize digital marketing, word-of-mouth promotion, and partnerships with government, academic institutions, and tourism communities to ensure that tourism growth remains consistent with environmental carrying capacity.

The main contribution of this study lies in integrating the Ecotourism Opportunity Spectrum (ECOS) and Doxey's Irritation Index into a single analytical framework. By integrating the assessment of tourism product conditions through ECOS with community attitudes through Doxey's Irritation Index, this framework provides a more comprehensive basis for tourism product development and sustainable tourism planning in emerging ecotourism destinations.

Future research is recommended to examine visitor behavior, environmental carrying capacity, and the long-term socio-cultural impacts of tourism using larger samples and longitudinal approaches to evaluate changes in destination conditions and community attitudes over time.

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