



Developing nature tourism potency at buffer villages of Gunung Leuser National Park: case study of Bahorok Resort, Langkat Regency, North Sumatra

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ABSTRACT

Bahorok is a sub-district in the Gunung Leuser National Park (GLNP), Langkat Regency, North Sumatra Province. Bahorok has buffer villages directly adjacent to the national park such as Timbang Lawan Village, Batu Jongjong Village, and Lau Damak Village. These three villages have many interesting tourist attractions, such as natural scenery, rivers, mountains, waterfalls, caves, and wildlife. The prominent attractions in the villages are the beautiful landscape and wildlife. This study aims to determine the potential of natural tourism and develop a strategy for tourism in the buffer villages of GLNP, Bahorok Resort. The methods used in this study are observation and interview with purposive sampling. Data was analyzed using guidelines for developing destination and SWOT analysis. The results of this study show that the potential of tourism objects in buffer villages is feasible to be developed, and increases business opportunities. The three villages are feasible to be developed as new destinations. Tourism feasibility of the three villages varies, in Timbang Lawan Village 72.75%, Batu Jongjong Village 79.88% and Lau Damak Village 73.58%. Furthermore, they have differences in developing tourism strategies based on the specific internal and external factor. The progressive strategy for Timbang Lawan Village (quadrant I), a changing strategy for Lau Damak Village (quadrant III), and a diversification strategy for Batu Jongjong Village (quadrant II). It shows how important the role of buffer villages at Bahorok Resort in developing tourism in the future.

Keyword: Bahorok, Buffer Village, Nature Tourism, Strategy

1. Introduction

Nature tourism is the voluntary, short-term travel activity that involves enjoying the uniqueness and beauty of the natural world in wildlife reserves, national parks, grand forest parks, nature tourist parks, and other locations while also expanding one's knowledge. Besides that, it can be interpreted as going on an excursion or picnic [1]. Natural tourist objects and attractions are the most important link in tourism activity because they become the reason for tourists visiting destinations [2]. Strong and sustainable regional economic development is an effective collaboration between the utilization of existing resources, the community, and the government. It's a concept of ecotourism. In this context, tourism is an inseparable part of conservation efforts, empowering the local economy and encouraging higher respect for cultural differences [3].

The development of natural tourism influences the welfare of the community. It also influences the increase of income community with the presence of tourist attractions such as beautiful nature, a good environment, and interesting places that can provide employment opportunities for the community, facilities, and accessibility. Natural resources attract tourists to visit and generate higher income earned by the local community from developing natural tourism [4].

Natural tourism in many cases covers an area directly adjacent to a conservation area that has limited land use and is provided with an additional layer of protection for the conservation area called a buffer zone. It has a general definition as an area that surrounds or is directly adjacent to the core area and is identified to protect the core area from the negative impact of human activities, activities that may be carried out are only activities that support activities in the core area. The buffer zone is used for the protection of conservation areas or core zones. The buffer zone area is an area between activity and supporting facilities. One of the functions of this area is to maintain the tourist activities surrounding the conservation area [5].

Gunung Leuser National Park (GLNP) is part of the Tropical Rainforest Heritage of Sumatera, recognized by UNESCO (United Nations Educational, Scientific and Cultural Organization) in 2004. The buffer zone of GLNP has an attractive natural potential to be developed as a tourist destination. One of them is at Bahorok Resort, Langkat Regency. It become a mega biodiversity hotspot inside and outside the national park and a habitat for 4 endemic wildlife such Sumatran tiger (*Panthera tigris sumatrae*), Sumatran elephant (*Elephas maximus sumatranus*), Sumatran rhino (*Dicerorhinus sumatrensis*) and Sumatran orangutan (*Pongo abelii*) [6]. The research area covers 3 alternative tourism destinations (Timbang Lawan, Lau Damak, and Batu Jongjong Village), other than well-known locations namely Bukit Lawang. It aimed to identify the potential tourism attractions in Bahorok Resort and analyze development strategies. The results of the research will be useful for tourism managers in preparing steps that must be taken in future development.

2. Method

This research was carried out in April 2022 in Bahorok Resort of the GLNP buffer villages, namely Timbang Lawan Village, Batu Jongjong Village and Lau Damak Resort Bahorok Village, Langkat Regency, North Sumatra. Data processing and research data analysis were carried out at the Forest Resources Conservation Laboratory. The tools used in this research include stationery, a camera, a laptop, and Arcgis 10.3 software. The material used in the research was a questionnaire.

2.1. Research Procedures

Data collection uses qualitative methods by conducting interviews with key informants, the public and visitors, making observations, and making questionnaires. Observation of objects and natural attractions was done to know and obtain the information needed to answer research problems. The results of observation are activities, events, and object conditions. Interviews were conducted as a process to collect and obtain information by asking questions and answers between researchers and informants, these informants include key informants of heads of villages, local communities, and visitors.

2.2. Data Collection

Primary data required in this study include: the potential of Nature Tourism in Timbang Lawan Village, Batu Jongjong Village, and Lau Damak Village in Bahorok Resort then described descriptively and determine priority objects that have the potential to be developed. The secondary data required in this study include the general condition of the research location and visitors at Bahorok Resort. Respondents were chosen selectively from the management of tourist information (n=1), heads of villages (n=3), farmers surrounding the potential area (n=135), and visitors who came to Timbang Lawan Village (n=50), and Batu Jongjong Village (n=50).

2.3. Data Analysis

Data from interviews and observation results of tourism attraction was analyzed descriptively based on natural scenery, tourist attraction, geology condition, wildlife existing, location connection with other destinations, facilities, and amenities. It refers to guidelines for developing objects and nature attractions from the Indonesian Ministry of Forestry, namely the ADO-ODTWA guidelines of the Directorate General of PHKA, 2003 [7]. The total value for one ODTWA assessment indicator can be calculated using the formula:

$$S = N \times W \quad (1)$$

Remark:

S : score/value of criterion
 N : the sum of the values of the elements in the criteria
 W : weight value

The score of each indicator is obtained then the results are compared with the total score of an indicator. The score obtained from each variable will be found in the level of eligibility using the following formula:

$$\text{Feasibility Index} = \frac{S}{S_{\max}} \times 100\% \quad (2)$$

Remark:

S : Score/Value of a Criterion

S max : Maximum score for each Criterion

The feasibility index for a tourist destination is as follows:

- The feasibility level of > 66.6%, a tourist destination is feasible to be developed
- The feasibility level of 33.4% - 66.5%, a tourist destination is moderate to be developed
- The feasibility level < 33.3%, a tourist destination is low and not feasible to be developed

The development strategy of natural attractions in the village is done by SWOT analysis (Strength, Weakness, Opportunity, and Threat) [8]. Two factors include internal factors analysis summary (IFAS) criteria, which are strengths and weaknesses. The two others include external factors analysis summary (EFAS) criteria, which are opportunities and threats. The accepted criteria are then analyzed by giving weight and rating to each criterion. The weights have an interval ranging from 0 (not important) to 1 (very important). Rating, for each factor (probability and strength) is given a scale ranging from 1 (lowest) to 4 (highest). As the next step of SWOT, Weihrich (1982) in [9] developed TOWS as an alternative strategies. In developing strategies TOWS matrix provides a logical combination of factors related to internal strengths (or weaknesses) and external opportunities (or threats).

3. Results and Discussion

3.1. Potential Natural Tourism Objects in Bahorok Resort

The potential of natural attractions is a tourism site that utilizes the potential of natural resources, both in a natural state or cultivation area. Direct observation was done by following key informants who knew well all the objects where the visitors often came in. They pointed Landak River in Timbang Lawan Village, beautiful natural panorama of Batu Katak river in Batu Jongjong Village, and natural beauty of forests, and caves in Lau Damak Village. Potential objects of interest to visitors can be an initial clue in determining the tourist attraction [10]. Those views of potential tourism objects for each village can be seen in Figures 1 and 2.

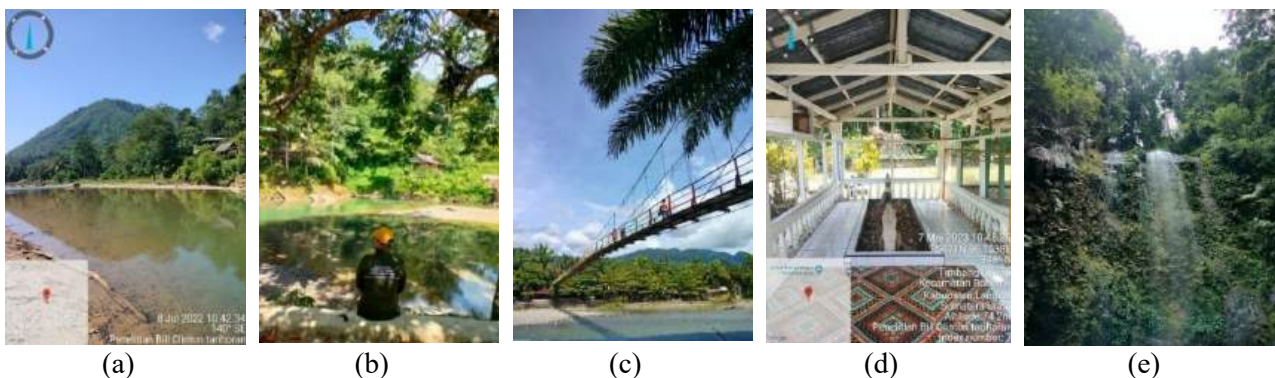


Figure 1. Tourist attractions in Timbang Lawan Village (a) Forest and Hill Panorama, (b) Landak River, (c) Bahorok River, (d) Datok Landak Tomb, and (e) Selang Pangeran Waterfall

The Landak River is one of the Timbang Lawan destinations that most attract visitors. There are also hills and Selang Pangeran waterfalls that can be enjoyed in Timbang Lawan Village. There also is a potential of Bahorok River which is used for bathing place, swimming, and camping for visitors near the riverbank. Selang Pangeran has been gaining popularity in the last few years [11].

Visitors can enjoy bathing and swimming with green forest panoramas at Batu Katak River, Batu JongJong Village. Batu Katak attraction provides many views including a green river flow with shallow deep so that it can be enjoyed by all groups from young to old people [12]. It's also supported with facilities such as lodging, restaurants, toilets, and parking that are belonging to community that supposed to be income generating and fit to problem solving of poverty alleviation [13].

Adventure tourism was offered within Lau Damak Village. Visitor could go for trekking and cruising through caves. There are many caves ranging from large to small caves. The favorite caves in Lau Damak are most visited by many tourists namely the Water Cave, Batu Rijal Cave, and Pintu Angin Cave. These caves have a uniqueness that can be enjoyed by tourists. However, to go to these caves, visitors must do trekking because the cave is in the middle of a highland forest and passes through community farms. To reach the cave visitors need a tour guide who can guide tourists and explain everything about attractions surrounding the cave. In some tourist destinations, the existence of caves has attracted tourists for an adventure tourism by enjoying stalactites and stalagmites [14-16]. All guides work under the community team called BITCO (Banana Island Tiger Community).

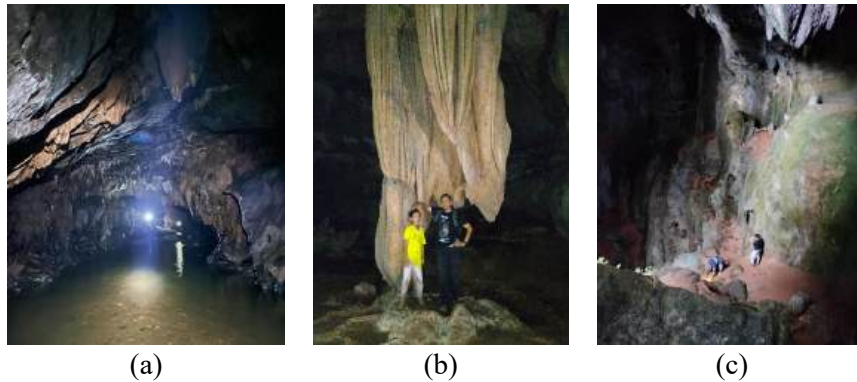


Figure 2. View of Caves at Lau Damak: (a) Water Cave, (b) Batu Rijal Cave, and (c) Pintu Angin Cave

Analyzing the components natural tourism in Bahorok Resort are assessed from the attractiveness of the location, accessibility of location, socio-economic, available accommodation around the tourist attraction, and supporting facilities and infrastructure. The results were obtained through direct observation in the field. Timbang Lawan Village is feasible to be developed as a tourist attraction with feasibility level reach 75.66%. Batu Jongjong Village and Lau Damak Village are also feasible to be developed as a tourist destination with values for each 76.21% and 70.88%. All remarks are bigger than 66.66% as the minimum level of feasibility based on guidelines of ODTWA. For newly developed tourism destinations, the average value of Bahorok 74.25% is a good starting capital in the development of tourism in the future. The feasibility of the destination will be considered by visitors to come travelling to the place [17]. It can be seen completely in Table 1.

Table 1. Resume of feasibility level of development of nature tourism in Resort Bahorok

Village	Criteria	Weight	Value	Score	Score Max	Index	Remark
Timbang Lawan	- Attraction	6	160	960	1080	88.88	Feasible
	- Accessibility	5	70	350	450	77.77	Feasible
	- Socio-economic	5	80	400	600	66.66	Feasible
	- Accommodation	3	45	135	180	75	Feasible
	- Facilities and Infrastructure	6	70	210	300	70	Feasible
	Feasibility Level					75.66	Feasible
Batu Jongjong	- Attraction	6	150	900	1080	83.33	Feasible
	- Accessibility	5	85	425	450	94.44	Feasible
	- Socio-economic	5	80	400	600	66.66	Feasible
	- Accommodation	3	40	120	180	66.66	Feasible
	- Facilities and Infrastructure	6	70	210	300	70	Feasible
	Feasibility Level					76.21	Feasible
Lau Damak	- Attraction	6	155	930	1080	86.11	Feasible
	- Accessibility	5	75	375	450	83.33	Feasible
	- Socio-economic	5	80	400	600	66.66	Feasible
	- Accommodation	3	35	105	180	58.33	Moderate
	- Facilities and Infrastructure	6	60	180	300	60	Feasible
	Feasibility Level					70.88	Feasible

We have been able to verify with feasible data of the work developed in recent years in creating and maintaining a socio-economic development system through equitable tourism in this area. Small, well-focused investments with the appropriate work teams provide value to the villages. These in turn are bearers of sustainable development that invests time in educational programs and biodiversity conservation. The development of the villages adjacent to the national park sustainably and equitably is a necessary bridge in the conservation of the ecosystem [18]. The collaboration of all counterparts makes the sustainable tourism development program in these villages possible.

One of the tourism potentials in the buffer zone is the activities of the people within the area. Land use in the buffer area of Bahorok Resort is an example of how to integrate natural potential with community activities as a tourist attraction. In addition, land use patterns can describe the socio-economic conditions of the community, where visitors could learn community activities in agricultural land, plantations, rice fields, etc. What visitors can see and enjoy in each type of land use is a valuable experience that they may not find elsewhere. The traditional lifestyle of the community is often an attractive attraction for tourists [19-20]. The creativity of tourism managers in packaging community attractions at the edge of the forest can be the key to success in developing tourist destinations [21]. The results of the land use pattern in Timbang Lawan Village, Batu Jongjong Village, and Lau Damak Village can be seen in the following Table 2 and Figure 3.

Table 2. Land use patterns in 3 Villages of Bahorok Resort

Nr.	Land Use	Timbang Lawan	Lau Damak	Batu Jongjong
		Area (ha)	Area (ha)	Area (ha)
1.	Settlement	45.30	13.14	9.06
2.	Plantation	1,314.62	2,551.95	461.52
3.	Ricefield	267.49	-	-
4.	Field	35.2	230.15	-
5.	Forest	395.68	1,035.05	1,449.64
6.	GLNP	96.48	1,775.55	6,548.79

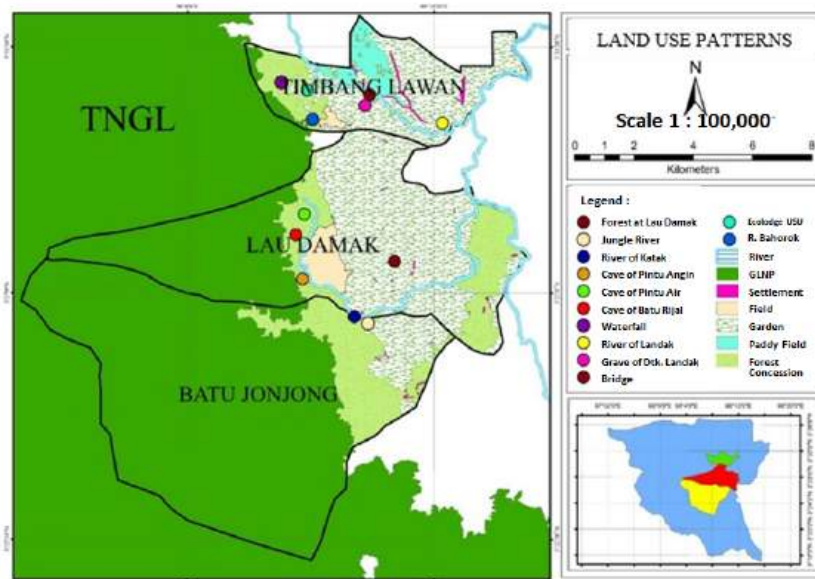


Figure 3. Land use pattern at Bahorok Resort

In Table 2, the majority of people in Timbang Lawan Village, Batu Jongjong Village and Lau Damak Village are farmers and most of them have small area. For those who have no land, they worked on plantations owned by private companies and state companies. In Lau Damak Village most of the land used as a plantation which covers 2,551 ha. It's a combination between palm oil and rubber plantations. The three villages are directly adjacent to GLNP, and mostly are natural forest area. Batu Jongjong Village has the largest forest land, covering 6,548 ha, and the least in Timbang Lawan Village 96 ha. Forest is one of land use patterns that can be utilized as a tourist attraction. There are some tourism activities to be developed in forest, such as enjoying forest scenery, seeing flora and fauna in the forest, and trekking [22].

3.2. Tourism Development Strategy

SWOT analysis is used to monitor, evaluate, review, and determine the development strategy of natural attractions in GLNP buffer villages of Bahorok Resort. The main components consist of internal and external

factors. Although each GLNP buffer zone village has its own characteristics, but in general we made a resume from internal and external factors such as as showing in Table 3.

Table 3. SWOT Analysis Matrix in Bahorok Resort

E X T E R N	INTERN		
	Identification of Factors	STRENGTHS (S)	WEAKNESS (W)
		1. Natural beauty of panorama 2. Local wisdom/culture and indigenous knowledge 3. Strategic location from the national park 4. Endemic wildlife	1. Limited tourist facilities and infrastructure 2. Unproperly tourism potential management 3. Lack of funds for tourism development 4. Lack of government policy and strategic action
	OPPORTUNITY (O)	STRATEGY S-O	STRATEGY W-O
	1. Generating community income 2. Utilizing natural resources for tourism development 3. High interest of tourists to travel and vacation in nature	1. Utilizing natural resources as a tourist attraction 2. Maximizing tourism potential with the support of the government and other related parties 3. Optimizing community participation and support in nature conservation and generating income 4. Improving local communities capacity in tourism development	1. Providing supporting facilities, infrastructure, and funding for tourism development. 2. Making integrated policies and regulations for developing tourism potential 3. Conducting capacity building for local communities in managing tourism attractions 4. Promoting tourism attraction by engaging multi-stakeholders and making collaboration
	TREATHS (T)	STRATEGY S-T	STRATEGY W-T
	1. Environmental pollution and disaster 2. Disruption of wildlife 3. Low community awareness in preserving tourism objects 4. Changes in community culture	1. Conducting socialization with the community about their tourism potential 2. Conducting counseling to the community in environmental conservation and culture 3. Making awareness for visitors from disturbing or providing food to wildlife in the destination 4. Promoting or marketing the natural attractions	1. Maintaining the potential attractions by local community and tourism management. 2. Paying attention to tourist attractions and preserving the environment 3. Avoiding wildlife habitat disturbance 4. Socializing the people who live around destination about the importance of the role of natural resources for tourist attraction.

Each strength, weaknesses, opportunities, and threats have their own weight and rating according to the information and direct observations in the field. All scores of the villages in Bahorok Resort were calculated on IFAS and EFAS base such as shown in Table 4. In Table 4, it can be seen that the internal and external factors of tourism development at each village of Bahorok Resort. The result of the calculation of strengths-weakness in Timbang Lawan Village, IFAS is $3.92 - 3.5 = 0.42$. In the other hand, the calculation of opportunities-threats, EFAS is $3.89 - 2.82 = 1.07$. It means the total score of IFAS is less than EFAS with the coordinate position (0.42;1.07) in quadrant I (see Figure 4). Case in Batu Jongjong Village showed a different situation. The IFAS calculation is $4 - 3 = 1$, while the EFAS calculation is $3.37 - 4 = -0.63$. It means that IFAS is greater than EFAS with the coordinate position (1.00;-0.63) in quadrant II. Lau Damak Village also showed a different result. The calculation of IFAS is $3.5 - 4 = -0.5$, while, EFAS is $4 - 3.66 = 0.34$. It means EFAS is greater than IFAS with the coordinate position (-0.5;0.34) in quadrant III. After knowing the position of each village, we resumed all calculation in Table 5, and found the suitable strategy in the development of destination of the three villages with quadrant position such as showing in the Figure 4.

Table 4. IFAS and EFAS matrix of nature tourism development in Bahorok Resort

Internal Factor	Timbang Lawan			Batu Jongjong			Lau Damak		
	Weight	Rating	Score	Weight	Rating	Score	Weight	Rating	Score
Strength:									
Natural scenery	0.25	5	1.25	0.38	4	1.52	0.2	4	0.8
Tourism attraction	0.25	4	1	0.25	4	1	0.3	4	1.2
Panorama	0.17	4	0.68				0.3	3	0.9
Strategic location	0.17	3	0.51	0.37	4	1.48			
Wildlife	0.16	3	0.48				0.2	3	0.6
Total	1	19	3.92	1	12	4	1	14	3.5
Weakness:									
Facilities and amenities	0.25	3	0.75	0.24	3	0.72	0.25	4	1
Tourism potential is not managed well	0.25	3	0.75				0.25	4	1
Lack of public knowledge/skill	0.25	4	1	0.15	3	0.45			
Lack of government support	0.25	4	1	0.23	3	0.69	0.25	4	1
Lack of promotion				0.23	3	0.69	0.25	4	1
Lack of public transportation				0.15	3	0.45			
Total	100	14	3.5	1	15	3	1	16	4
External Factor									
Opportunities:									
Government strategic program	0.23	4	0.92						
Natural resources conservation	0.16	4	0.64	0.37	4	1.48	0.38	4	1.52
Motivation to visit destination	0.23	4	0.92						
Creating business and increase income	0.15	4	0.6	0.38	3	1.14	0.25	4	1
Providing job opportunities	0.23	4	0.81	0.25	3	0.75	0.37	4	1.48
Total	1	20	3.89	1	11	3.37	1	12	4
Threat:									
Environmental pollution	0.28	3	0.84	0.38	4	1.52	0.34	3	1.02
Disturbing wild animals	0.27	3	0.81				0.33	4	1.32
No specific attraction	0.27	3	0.81	0.37	4	1.48			
Lack of community concern	0.18	2	0.36	0.25	4	1	0.33	4	1.32
Total	1	11	2.82	1	12	4	1	11	3.66

Table 5. Recapitulation of IFAS and EFAS factor values in Bahorok Resort

No.	Factor	Timbang Lawan			Batu Jongjong			Lau Damak		
		b	r	b x r	B	r	b x r	b	r	b x r
	IFAS									
1.	Strength	1	19	3.92	1	12	4.0	1	14	3.5
2.	Weakness	1	14	3.50	1	15	3.0	1	16	4.0
Total (S-W)				0.42	1.0			-0.5		
	EFAS									
3.	Opportunity	1	20	3.89	1	12	3.37	1	12	4.0
4.	Threat	1	11	2.82	1	11	4.0	1	11	3.66
Total (O-T)				1.07	-0.63			0.34		

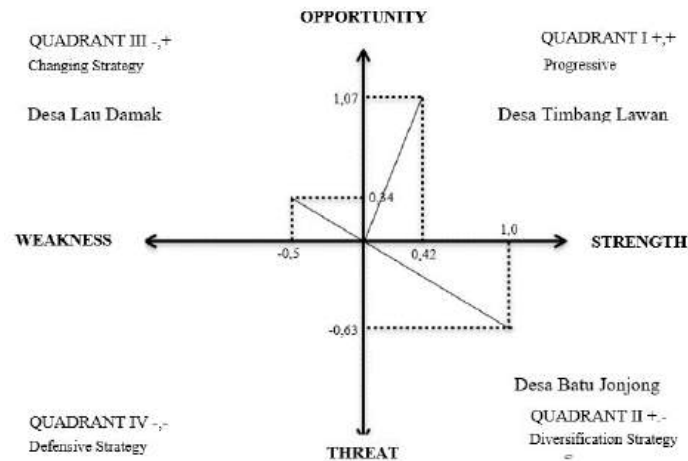


Figure 4. Strategy of developing tourism of 3 villages at Bahorok Resort

The diversity of development strategies in each tourist destination is natural, as the internal and external factors that affect tourist destinations are very distinctive or specific [23]. From Figure 4 above, it can be seen that the strengths and weaknesses as well as opportunities and threats in Timbang Lawan Village, Batu Jongjong Village, and Lau Damak Village can determine the position of development strategy. Quadrant I of Timbang Lawan Village is a very favorable situation. The development strategy of destination that must be applied in this condition is to support aggressive growth policies (Growth). It means that there are opportunities and strengths so that it can take advantage of existing opportunities [24]. Efforts are made to optimise resources, the role of government in tourism management, community participation, institutions and tourism facilities.

Quadrant II of Batu Jongjong, despite facing various threats, still has internal strengths. The strategy that should be developed is diversification. Existing strengths must be maximized to deal with threats [25]. Efforts can be made to optimize potential, waste management, environmentally friendly construction and create local-based tourism support products.

Quadrant III of Lau Damak is facing great opportunities, but on the other hand must face several obstacles, especially internal weaknesses. The strategy that must be developed is a changing strategy. This means that changes are made by maximizing existing opportunities to reduce existing weaknesses [26]. Efforts that can be made include optimizing the potential of tourism by cooperating with the private sector, using local workers and increasing the role of the community in providing tourist facilities. The following summary steps on the strategies used in the development of natural attractions in three villages can be seen in Table 5.

Table 5. Results of strategy determination based on SWOT in Bahorok Resort

Timbang Lawan Village (QI) - SO (Strength - Opportunities), Progressive Strategy	
1.	Utilizing natural resources and natural beauty as a tourist attraction
2.	Maximizing the management of tourism potential with government support and assistance
3.	Optimizing community participation and support in nature conservation
4.	Improving the performance of tourism managers and local communities by completing tourism facilities to support increased tourist activities in making visits
Batu Jongjong Village (QII) - ST (Strength-Threats), Diversification Strategy	
1.	Optimizing the potential of natural resources and maintaining the cleanliness of the tourist attraction environment by making enough trash bins and making a ban on littering so that the area is not polluted.
2.	Developing and constructing of environmentally friendly tourist attractions by conducting environmental management activities in preserving tourist attractions with the local community.
3.	Making superior products such as souvenirs, and handicrafts and utilizing strategic locations to sell its potential
Lau Damak Village (QIII) - WO (Weakness-Opportunities), Changing Strategy	
1.	Optimizing natural resources that have the potential to be used as tourist attractions by cooperating with private companies to support the development of tourist attractions.
2.	Utilizing labor from the local community in managing tourist attractions.
3.	Increasing community participation with the management to complete the facilities needed in tourism activities.

4. Conclusion

Based on the results of this study, it can be concluded that natural tourism in Timbang Lawan Village, Batu Jongjong Village, and Lau Damak Village has the potential for natural attraction that can be utilized as an alternative tourist destination. This tourist attraction can increase business opportunities in the village, and tourism potential in the three villages is feasible to be developed as the new destination. Tourism feasibility in the three villages varies, in Timbang Lawan Village 72.75%, Batu Jongjong Village 79.88% and Lau Damak Village 73.58%. The three villages also vary in developing tourism strategies that are specific to each location based on internal and external factors in the field from the SWOT analysis, such as progressive strategy for Timbang Lawan Village (quadrant I), changing strategy for Lau Damak Village (quadrant III), and diversification strategy (quadrant II).

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