



**JOURNAL OF TOURISM,
HOSPITALITY AND
ENVIRONMENT MANAGEMENT
(JTHER)**

www.gaexcellence.com/jthem



STRATEGIC ANALYSIS USING SWOT/TOWS-AHP: AN APPLICATION ON RURAL TOURISM INDUSTRY IN SABAH

Alif Muazzam Lumin^{1*}

¹PhD, Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah

 alif_muazzam_db24@iluv.ums.edu.my

 <https://orcid.org/0009-0006-1336-3179>

*Corresponding Author

Article Info:

Article history:

Received date: 26.01.2026

Revised date: 09.02.2026

Accepted date: 16.03.2026

Published date: 30.03.2026

To cite this document:

Lumin, A. M. (2026). Strategic Analysis Using SWOT/TOWS-AHP: An Application on Rural Tourism Industry in Sabah. *Journal of Tourism Hospitality and Environment Management*, 11 (43), 413-431.

DOI:10.35631/JTHER.1143026

Abstract:

Rural tourism represents a vital economic and socio-environmental asset for Sabah. Rural tourism would not only benefit the industry but also help to generate income among villagers. However, the sector continues to face challenges related to infrastructure limitations, human capital deficiencies, and rapidly evolving digital tourism marketing landscape. This study integrates SWOT/TOWS analysis with the Analytic Hierarchy Process (AHP) to identify and prioritize strategic initiatives for sustainable rural tourism development. Qualitative data from focus group discussions with rural tourism operators informed the identification of key internal and external factors. Results indicate that Strength–Opportunity strategies particularly eco-tourism promotion, cultural experience integration, and collaboration with government initiatives to enhance digital visibility carry the highest strategic weight. Conservation measures and financial support strategies hold moderate priority, while internal operational improvements rank lower. The findings offer an evidence-based strategic framework to support tourism operators and policymakers in enhancing competitiveness, sustainability, and community participation across Sabah’s rural tourism sector.

Keyword:

AHP, Rural Tourism, Sabah, Strategic Analysis, SWOT/TOWS



© The authors (2026). This is an Open Access article distributed under the terms of the Creative Commons Attribution (CC BY NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution,

Introduction

Rural tourism has played a vital role in reviving the rural economy (Ristic et al., 2019). Rural tourism is a type of vacation in which visitors spend a significant amount of their time enjoying recreational activities in rural areas or on farms surrounded by nature (Ristic et al., 2019; Rosalina et al., 2021). Rural tourism can also be a form of tourism that involves visiting rural places to partake in a variety of activities for tourists to experience rural life more authentically or to be closer to nature (Liu et al., 2020).

Malaysia views rural tourism as one of its key strengths, given the abundance of its natural resources, heritage, and diverse culture (Latip et al., 2019). Rural tourism in Sabah supports essential ecosystems and endangered wildlife species such as Bornean elephant, orangutan, and proboscis monkey, all of which are on the edge of extinction and listed as red species by the IUCN Red List (Estes et al., 2012; Pimid et al., 2020). Apart from the wildlife, it is also known for the nature and cultural values of the local indigenous people (Pimid et al., 2020). With Sabah's rich living legacy and ethnic diversity, it is also regarded as one of the world's twelve mega-diversity locations, making it perfect for rural tourism (Latip et al., 2019). Many studies have examined the visitor perspectives, yet few have focused on the host communities (Rosalina et al., 2021; Wilson et al., 2001).

This paper provides insights for a broader understanding and knowledge of rural tourism from the viewpoint of Sabah, Malaysia. This study is necessary due to the increasing acknowledgement of the great potential of the tourist industry. The research findings from the SWOT/TOWS and AHP analysis of rural tourism are useful as strategic information for the initiative to portray Malaysia as a rural tourism destination in the eyes of the international community. Therefore, understanding factors that motivate local people to engage in rural tourism activities is critical in order to increase the rural economy, alleviate absolute poverty, and protect the natural resources.

Literature Review

Rural tourism has been the subject of extensive research from various perspectives. Ruiz-Real et al. (2020) pointed out that rural tourism and its development have attracted significant attention, prompting an increased number of research studies into the subject. Recent research by Nongbri and Singh (2022) examined sustainable rural tourism and entrepreneurship while López-Sanz et al. (2021) focused on rural tourism and the sustainable development goals. And Alacron (2020) reviewed sustainable rural tourism, and Ivona (2021) examined the sustainability of rural tourism and promotion of local development. Moreover, Martini et al. (2020) investigated the role of female entrepreneurs in sustainable tourism development in marginal rural mountain areas. Radović et al. (2020) studied financing problems in rural tourism. López-Sanz et al. (2021) delved into rural tourists' behaviour regarding sustainable development goals. Additionally, Rosalina et al. (2021) studied the economic impacts of rural tourism while Bajrami et al. (2020) investigated rural residents' perceptions of sustainable tourism development. Beyond that, Getz and Carlsen (2000) looked at the characteristics of rural tourism enterprises, and Kastenholz et al. (2018) studied the dimensions of rural tourism

experiences. Kantar and Svržnjak (2017) delved into rural tourism development from sociological perspectives, and Podovac (2016) investigated the importance of sustainable rural tourism development in Serbia. Likewise, extensive studies have been conducted on the conceptualization of rural tourism (Lane, 1994), the basic motivations of rural tourists (Park & Yoon, 2009), and the problems encountered in rural tourism diversification (Sharpley, 2002). Adopting sustainable practices has been a topic of interest in various aspects of the literature. It seems the past studies on rural tourism are fragmented. There has been a prevalence of studies focused on the concept of sustainable rural tourism and the understanding of sustainable tourism from the environmental, economic, and social aspects in a holistic manner and from the customers' perspectives (An & Alarcon, 2020) but not from the tour operator's perspective (Hamid & Isa, 2020). However, sustainable tourism, in particular sustainable practices, requires participation by all the stakeholders in the tourism industry (United Nations Environment Programme & World Tourism Organization, 2005). Little is known about the extent of sustainable practices from the rural tourism operators, especially the meaning of and motives for sustainable practices adopted in rural areas of Sabah. Arguably, such information is vital for state tourism agencies and related policy makers in implementing sustainable development in rural sites with sound strategies. Increasing the competitiveness of rural tourism destinations and increasing the number of quality tourism experiences are critical for long-term sustainable growth.

In the context of Sabah, numerous rural areas rich in natural and cultural resources have the potential to be developed as rural tourism destinations by the local community. Local communities are taking advantage of tourism opportunities to diversify rural economies and local development and as a way of revitalizing their respective districts. Over the years, rural tourism has become an important and fast-growing sector in Sabah, creating unique rural tourism experiences and generating benefits to the local communities, which are crucial to ensure competitiveness and sustainable growth (Chan, 2020). Sustainable rural tourism is vital to ensure the continuation of the abundant resources and unique experiences at the rural sites. However, it is unknown to what extent the sustainability concept has been applied in the rural context by the rural tourism community and operators. Rural communities are important stakeholders in a tourism destination (Gajdošík et al., 2018) because they co-create the tourism product and can significantly affect the visitors' opinions of the destination. Simply, they are the owners and guardians of their local resources land, buildings, local products upon which development is based. Their skills, traditions, knowledge, and energy are the principal resources for rural development; their engagement is vital. These are the people who live in a particular rural area that is the basis for sustainable development. They know best what, how and why for sustainability practices.

Definition of Rural Tourism

The Organization for Economic Cooperation and Development (OECD) (1994) defines rural tourism as tourism taking place in the countryside. Reichel et al. (2000) associate the term with rural areas, special features of the rural world, small-scale enterprises, open space, and sustainability. Meantime, scholars have proposed various interpretations of rural tourism. Bramwell and Lane (1994) relate it with activities and interest in farms, nature, adventure, sports, health, education arts, and heritage. According to Gartner (2004), there are indications that demand for rural-based tourism will continue to grow. Many small firms in rural areas are created to respond to the attractions of rural places (Irvine and Anderson, 2004). Brown and Hall (1999) argue that a place that is remote and difficult to reach may be perceived by tourists

to have certain qualities symptomatic of its situation, such as natural beauty, quietness, and uniqueness. Hence, the roles played by government and local community in the promotion of entrepreneurship and marketing for ecotourism are considered vital. Efforts to promote entrepreneurship include creation and combination of existing resources to develop and commercialize new products and thus serve new customers and markets (Schendel and Hitt, 2007).

Existing Challenges

Challenges were identified that mostly referred to the foreseen shortcoming of capabilities of working members in handling rural tourism. Meanwhile, the resource issue was also quite worrying since the development of rural attraction may determine the business longevity (Dasan, J. et al., 2022).

Table 1: Existing Challenges

Challenges	Descriptions
Basic tourism infrastructure	It can be challenging for rural tourism operators when the basic infrastructures are limited.
Tourism activities	Increasing tourism activities might increase solid waste pollution.
Skills and training	Workers in the organization lacks proper training and skills in tourism background including management, guides, F&B, safety, language and housekeeping.
Socio-economy background	Lack of participation or limited numbers of locals in the operation as the younger generation have moved out of the rural area to further study or work.

Source: Dasan, J. et al., 2022

Despite these challenges, there are ongoing government initiatives aimed at improving rural infrastructure which can boost tourism and local economies (Sabah Tourism Board, 2023). In addition, rural tourism can attract environmentally conscious travelers that emphasizes sustainable practices, minimizing pollution and preserving natural resources (Chan, 2020). The rural tourism operators also should join training programs conducted by government and various NGOs to improve the skills of local workers in tourism management, guiding and hospitality services (Malaysia Productivity Corporation, 2021). Other than that, implementing incentive programs that encourage young people to return to their rural communities after completing their education or gaining work experience can help to address lack of participation in the operation among the locals. This could include providing financial support, housing

benefits or start-up grants for those who want to engage in rural tourism enterprises (Hanafiah et al., 2013).

Internal and External Forces

The internal stakeholders include employees, managers, and owners. Most of managers in the tourism operators in small business are the owners who oversee all management issues such as finances and human resources (Danting et al., 2018). Key factor leads business into success is the cash flow management. Unfortunately, in real practice, most of the rural tourism business owners are lack of the knowledge in cash flow management especially in terms of avoiding risk and earning value (Dahmen & Rodriguez, 2014). The way they manage their cash flow in operations only carry out by their experience. It further discovers the roots of poor cash flow performance in the business. They also don't acknowledge the power of the cash flow management. A good vision in cash flow management can always help the business owners arrange their limited resources into the right place (Wang, 2015).

Besides, human resource is an important element that led the business to be success in the tourism industry (Riley, 2014). This also supported by Baum (2016) who explains that the major factor influences the business success in the service industry is human resources. It is essential for the tourism operators to invest more into the aspect of human resource management by employ enough professional tourism practitioners and provide regular training to help them sharpen their skills and update their knowledge in the field. It also declares that training is as importance as employee recruitment. However, due to the fast increasing of customer numbers, the tourism industry in Sabah now faces a problem with not enough professional to serve the customers. Although the government try to train more locals who working or willing to work in the tourism industry, it still cannot fulfil the large gap of lack of qualified tourism practitioners at the period. To meet the business demands, some of the small tourism operators start to hire the unexperienced staff without enough training and knowledge to work in the current industry.

Meanwhile, the external stakeholders in this study focused on the suppliers, customers and competitors. Customers as one of the main stakeholders are going to measure by studying customer engagement through multi-channels especially online social media. On the other hand, the study of suppliers and competitors was focused on the opportunities and threats from new online travel agencies. The internet technology is developing rapidly in this century. The applying of internet technology in tourism industry has been proven have significant influences with tourism operations in management, marketing and trading methods (Danting et al., 2018). Tourists today exhibit a strong a strong preference for obtaining information online rather than through traditional travel agents. This shift is driven by the perceived honesty and durability of online reviews and comments which remain accessible for extended periods. For instance, tourists trust online information more than other sources, appreciating the transparency and public accountability of social media platforms (Munar & Jacobsen, 2013).

Other than that, online travel agencies like TripAdvisor and Expedia are also an important external element for a success of rural tourism. These agencies primarily operate online and have substantial financial and human resources that making them appealing to modern travelers. The internet is now a more trusted source of information than traditional travel agents with one-fourth of tourists relying heavily on online reviews and websites for travel planning (Zeng & Go, 2013). Online travel agencies offer the same services as traditional operators but

with greater convenience and saving customer’s time. They attract more customers through 24-hour services and efficient online payment systems despite lacking deep industry experience. Online travel agencies often offer more affordable travel packages due to special deals with suppliers, giving them a competitive edge (Hui, 2016).

After internal and external factors are identified, AHP provides a systematic, quantitative framework to prioritize these factors and remove subjective bias in strategy formulation. The success of rural tourism businesses relies on effective cash flow management and investing in skilled human resources, areas where many small operators currently struggle. Additionally, the rise of online travel agencies like TripAdvisor and Expedia has reshaped the industry by offering convenience and competitive pricing, making them popular with travelers who trust online reviews. While these agencies pose competition, they also present opportunities for collaboration and expanding customer reach. Thus, enhancing internal management practices and leveraging the benefits of online platforms are essential for thriving in the modern tourism market.

Methodology

This study’s research design consists of three phases include establishing the study’s goals, locating, and enlisting participants and determining an appropriate venue for the study. The process begins with identifying the main aim and defining the key research objectives of the study.

In this investigation, the AHP framework emerges from the TOWS matrix and is divided into three components: (a) the objective to be accomplished by the decision, (b) the SWOT/TOWS categories, and (c) the factors encompassed within each TOWS category (sub- criteria). The hierarchical depiction of the TOWS framework is illustrated in Figure 2. This integration aims to harmonize the evaluation process by providing a structured method for weighting and prioritizing the various factors identified in the TOWS analysis (Gallego-Ayala & Juizo, 2011). To create a SWOT-AHP-based strategic management model, designed the following three phases model: building the initial task; modifying factors and building an evaluation model.

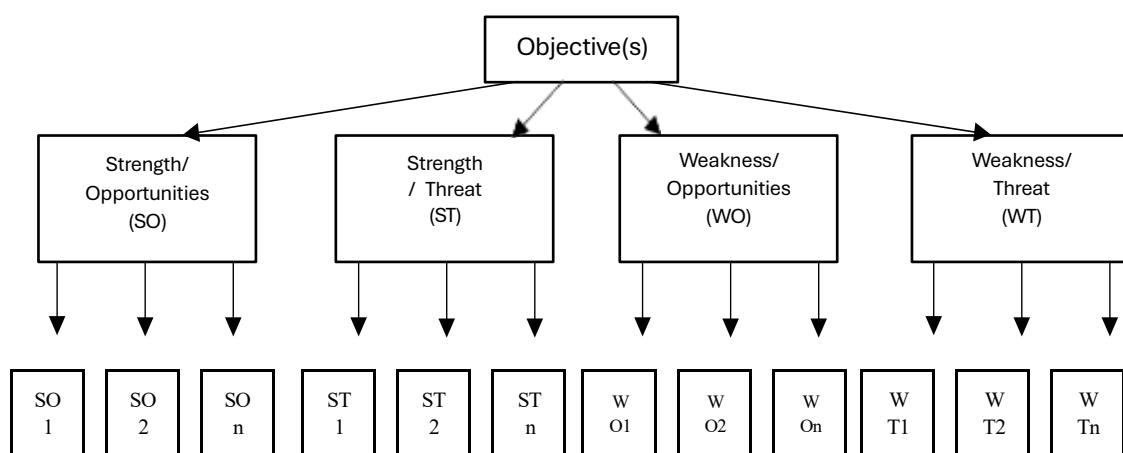


Figure 1: Hierarchical Structure of The TOWS Matrix

AHP Calculation

The primary concept behind integrating the Analytic Hierarchy Process (AHP) into the TOWS framework is to methodically evaluate the TOWS factors and render them comparable in terms of their significance (Kangas et al., 2003). AHP involves breaking down complex decisions into a hierarchical structure of criteria and alternatives and then comparing them pairwise to determine their relative importance. Here's a step-by-step guide on how to perform AHP calculations:

Step 1: Hierarchy Formation

Identify the decision you need to make and break it down into a hierarchical structure with multiple levels. The hierarchy typically consists of three levels: the goal, criteria, and alternatives.

Step 2: Pairwise Comparisons

For each pair of elements in the same level (criteria or alternatives), determine their relative importance by making pairwise comparisons. Use a scale from 1 to 9, where 1 indicates equal importance and 9 indicates extreme importance (refer to Table 4 below).

Table 2: AHP Pair-Wise Comparison Scale

Expert opinion on pair-wise ranking of importance of sub-criteria and main criteria in the hierarchy	Scale
If option A and option B are equally important	1
If Option A is moderately more important than Option B	3
If option A is strongly more important than option B	5
If option A is very strongly more important than option B	7
If option A is extremely important than option B	9
If option A and option B are equally important	1
Used to represent a compromise between the priorities listed above	(2,4,6,8)

Source: Saathy (2008; 1980)

Step 3: Consistency Check

Ensure consistency in your pairwise comparisons by calculating the consistency ratio (CR). CR helps you determine if your judgments are coherent. To compute CR, use the following steps:

- i. Calculate the matrix of pairwise comparison values.
- ii. Compute the weighted sum for each criterion or alternative by multiplying each value in the matrix by its corresponding weight and summing the results.
- iii. Divide the weighted sum of each element by its weight to get the priority vector.
- iv. Compute the largest eigenvalue (λ_{max}) of the matrix.

- v. Compute the consistency index (CI) using the formula: $CI = (\lambda_{max} - n) / (n - 1)$, where n is the number of criteria or alternatives.
- vi. Find the consistency index (RI) from a pre-defined table based on the order of the matrix (e.g., for a 3x3 matrix, RI is 0.58).
- vii. Calculate the consistency ratio (CR) by dividing CI by RI. If CR is less than 0.1, your judgments are considered consistent.

Step 4: Weight Calculation

After ensuring consistency, calculate the weights for criteria and alternatives using the priority vectors obtained from pairwise comparisons.

Step 5: Score Calculation

Finally, calculate the overall score for each alternative by multiplying the weights of criteria

η with their scores for each alternative and summing up the results. Below is a simplified formula for calculating the weighted sum of priorities:

$$\text{Weighted sum} = \sum_{i=1}^{\eta} \omega_i \cdot A_i$$

Where:

ω_i is the weight of its criterion or alternative.

A_i is the priority or score of its criterion or alternative.

η is the total number of criteria or alternatives.

This formula is used at different levels of the hierarchy, such as calculating the weighted sum of criteria priorities to determine the overall priority of alternatives. According to Saaty (2008) the AHP methodology is summarized as:

- a. The problem is designed as a hierarchy containing the objectives, the alternatives, and the factors/sub-factors for evaluating the alternatives.
- b. Establish priorities among the variables of the hierarchy by making a series of judgements based on pair-wise comparisons of the elements.
- c. Incorporate these judgements to yield a set of overall priorities for the hierarchy.
- d. Make consistency check of the judgements.
- e. Conclude based on the results of this process.

SWOT Analysis

SWOT analysis is a strategic planning tool used to evaluate the Strengths, Weaknesses, Opportunities, and Threats of a business, project, or product (Benzaghta et al., 2021; Namugenyi et al., 2019; Weihrich, 1982). Performing the SWOT and AHP analysis for a Muslim-friendly homestay in Sabah can influence the viability of a business or project and develop strategies to maximize its strengths and minimize its weaknesses. There are 133 registered rural tourism in Sabah. Thus, an urgent need is to evaluate the internal and external environment affecting their operations and performance. To ensure that our data collection methods are directly related to the goals of our study.

Table 3: SWOT Matrix

No.	SWOT	Theme/Sub-theme
1.	Strength	
	1. The natural beauty and biodiversity of Sabah make it an ideal destination for nature lovers and adventure tourists (Latip et al., 2019) (S1).	S1 Rich Natural Resources
	2. The cultural diversity and heritage of Sabah, including the traditions and lifestyles of indigenous peoples, offer unique cultural tourism experiences (Pimid et al., 2020) (S2).	S2 Cultural Heritage
	3. Ongoing government initiatives to improve rural infrastructure support tourism development (Sabah Tourism Board, 2023) (S3).	S3 Government Support
2.	Weaknesses	
	1. Inadequate basic tourism infrastructure such as transportation, accommodations, and recreational facilities pose significant challenges (Dasan et al., 2022) (W1).	W1 Limited Infrastructure
	2. There is a lack of trained and skilled workers in the tourism sector, particularly in management, guiding, F&B, safety, language, and housekeeping (Riley, 2014; Baum, 2016) (W2).	W2 Skill Shortage
	3. Many rural tourism operators lack proper knowledge and practices in cash flow management, affecting their financial stability (Dahmen & Rodriguez, 2014; Wang, 2015) (W3).	W3 Cash Flow Management
3.	Opportunity	
	1. Implementation of sustainable practices can minimize pollution and preserve natural resources, aligning with global sustainability goals (Rosalina et al., 2021) (O1).	O1 Eco-Tourism Trends
	2. The rise of online travel agencies and the growing influence of social media provide platforms for broader reach and effective marketing (Munar & Jacobsen, 2013; Hui, 2016) (O2).	O2 Digital Marketing and Online Travel Agencies
	3. Forming partnerships with local businesses and other tourism operators can create comprehensive tourism packages and enhance the overall tourist experience (Danting et al., 2018).	O3 Local Partnerships

- 4. Threats**
1. Increased tourism activities may lead to environmental degradation, including waste pollution and habitat destruction (Dasan et al., 2022) (T1). T1 Environmental Degradation
 2. Economic fluctuations and potential financial crises can impact tourism spending and the viability of rural tourism businesses (Hamid & Isa, 2020) (T2). T2 Economic Challenges
 3. Socio-economic disparities and inadequate community involvement may affect the sustainability of tourism initiatives (Gajdošík et al., 2018). T3 Social Challenges

TOWS Analysis

Table 4: Tows Analysis

Factors	Sub-Themes	Experts						Total	%
		1	2	3	4	5	6		
SO	SO1 – Promote eco-tourism leveraging natural resources (S1, O1)	√	√	√	√	√	√	6	100%
	SO2 - Highlight cultural experiences as part of eco-tourism packages (S2, O1)	√	√	√	√	√	√	6	100%
	SO3 - Partner with government initiatives to boost online presence. (S3, O2)	√	√	√	√	√	√	6	100%
ST	ST1 - Implement conservation programs to protect natural resources (S1, T1)		√	√	√	√	√	5	83.3%
	ST2 - Promote responsible tourism practices to protect cultural sites (S2, T1).	√	√	√	√		√	5	83.3%
	ST3 - Seek government grants and subsidies to support tourism businesses (S3, T2)	√	√	√	√	√	√	6	100%
WO	WO1 - Seek eco-tourism grants to improve infrastructure (W1, O1)	√	√	√	√	√	√	6	100%
	WO2 - Utilize online training resources for staff development (W2, O2)	√	√	√	√	√	√	6	100%
	WO3 - Implement online financial tools to manage cash flow (W3, O2)	√	√	√	√	√	√	6	100%
WT	WT1 - Improve waste management to protect infrastructure (W1, T1)	√	√	√	√	√		5	83.3%
	WT2 - Train staff in eco-friendly practices (W2, T1)	√	√	√	√	√	√	6	100%
	WT3 - Implement stringent financial controls to navigate economic downturns (W3, T2)	√	√		√	√	√	5	83.3%

AHP Analysis and Strategic Alternative

Table 5: TOWS-AHP Analysis

TOWS group	Group priority	TOWS factors	Factor priority within the group	Overall priority of factors	Rank
SO	52.5%	SO1 – Promote eco-tourism leveraging natural resources.	12.0%	22.4%	1
		SO2 – Highlight cultural experiences as part of eco-tourism packages.	5.3%	16.0%	2
		SO3 – Partner with government initiatives to boost online presence.	6.0%	14.1%	3
ST	30.1%	ST1 – Implement conservation programs to protect natural resources.	6.5%	11.5%	4
		ST2 – Promote responsible tourism practices to protect cultural sites.	4.9%	8.3%	6
		ST3 – Seek government grants and subsidies to support tourism businesses.	6.5%	10.3%	5
WO	12.2%	WO1 – Seek eco-tourism grants to improve infrastructure.	3.2%	5.9%	7
		WO2 – Utilize online training resources for staff development.	2.1%	3.7%	8
		WO3 – Implement online financial tools to manage cash flow.	1.4%	2.6%	10
WT	5.2%	WT1 – Improve waste management to protect infrastructure.	1.6%	2.7%	9
		WT2 – Train staff in eco-friendly practices	0.6%	1.2%	12
		WT3 – Implement stringent financial controls to navigate economic downturns	0.8%	1.3%	11

Table 6: TOWS-AHP Calculator Analysis

Cat		Priority	Rank	(+)	(-)
1	SO1	22.4%	1	12.0%	12.0%
2	SO2	16.0%	2	5.3%	5.3%
3	SO3	14.1%	3	6.0%	6.0%
4	ST1	11.5%	4	6.5%	6.5%
5	ST2	8.3%	6	4.9%	4.9%
6	ST3	10.3%	5	6.5%	6.5%
7	WO1	5.9%	7	3.2%	3.2%
8	WO2	3.7%	8	2.1%	2.1%
9	WO3	2.6%	10	1.4%	1.4%
10	WT1	2.7%	9	1.6%	1.6%
11	WT2	1.2%	12	0.6%	0.6%
12	WT3	1.3%	11	0.8%	0.8%

The strategic analysis of rural tourism in Sabah using the TOWS-AHP framework reveals that promoting eco-tourism leveraging natural resources (SO1), highlighting cultural experiences within eco-tourism packages (SO2), and partnering with government initiatives to enhance online presence (SO3) are of the highest priority. These strategies are crucial for attracting tourists and supporting sustainable growth by capitalizing on Sabah's rich biodiversity and cultural heritage. Medium-priority strategies focus on conservation (ST1), seeking government grants (ST3), and promoting responsible tourism practices (ST2) to ensure long-term viability. Lower-priority strategies, such as improving infrastructure through eco-tourism grants (WO1), utilizing online training for staff development (WO2), and enhancing waste management (WT1), are important for operational stability but have a less immediate impact. This prioritization ensures a balanced approach, fostering growth, sustainability, and resilience in Sabah's rural tourism sector.

Table 7: Pairwise Comparison Matrix

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2.00	2.00	2.00	5.00	5.00	7.00	5.00	6.00	5.00	9.00	6.00
2	0.50	1	2.00	2.00	2.00	2.00	4.00	6.00	9.00	5.00	7.00	9.00
3	0.50	0.50	1	2.00	2.00	2.00	5.00	6.00	6.00	6.00	6.00	6.00
4	0.50	0.50	0.50	1	4.00	2.00	2.00	4.00	5.00	3.00	6.00	8.00
5	0.20	0.50	0.50	0.25	1	2.00	1.00	4.00	3.00	7.00	7.00	5.00
6	0.20	0.50	0.50	0.50	0.50	1	4.00	6.00	5.00	9.00	7.00	7.00
7	0.14	0.25	0.20	0.50	1.00	0.25	1	2.00	5.00	5.00	7.00	4.00
8	0.20	0.17	0.17	0.25	0.25	0.17	0.50	1	2.00	2.00	8.00	5.00

9	0.17	0.11	0.17	0.20	0.33	0.20	0.20	0.50	1	1.00	4.00	5.00
10	0.20	0.20	0.17	0.33	0.14	0.11	0.20	0.50	1.00	1	5.00	5.00
11	0.11	0.14	0.17	0.17	0.14	0.14	0.14	0.12	0.25	0.20	1	1.00
12	0.17	0.11	0.17	0.12	0.20	0.14	0.25	0.20	0.20	0.20	1.00	1

The pairwise comparison matrix provided represents a crucial step in the Analytical Hierarchy Process (AHP) for assessing the relative importance of various strategies in the context of rural tourism in Sabah. This matrix is instrumental in determining the priorities and guiding strategic decision-making. The entries in the matrix compare each strategy against others in terms of their relative importance.

The analysis reveals the dominance of high-priority strategies such as SO1 (Promote eco-tourism leveraging natural resources), SO2 (Highlight cultural experiences as part of eco-tourism packages), and SO3 (Partner with government initiatives to boost online presence). These strategies consistently rank highest, highlighting the critical importance of leveraging Sabah's unique natural resources, integrating cultural experiences, and enhancing online presence through government partnerships. Emphasis is also placed on conservation and financial support strategies like ST1 (Implement conservation programs to protect natural resources) and ST3 (Seek government grants and subsidies to support tourism businesses), which are essential for sustaining eco-tourism and supporting rural tourism businesses. Meanwhile, ST2 (Promote responsible tourism practices to protect cultural sites) shows moderate importance, underscoring the need for responsible tourism practices alongside other strategic initiatives. Moreover, lesser emphasis is placed on operational improvements such as WO1 (Seek eco-tourism grants to improve infrastructure), WO2 (Utilize online training resources for staff development), and WT1 (Improve waste management to protect infrastructure), indicating these are secondary to strategies directly related to natural and cultural resources and financial support. The lowest priority is given to strategies like WO3 (Implement online financial tools to manage cash flow), WT3 (Implement stringent financial controls to navigate economic downturns), and WT2 (Train staff in eco-friendly practices), which are crucial for internal management but do not have an immediate impact on attracting tourists.

Overall, the analysis suggests a multi-faceted approach for rural tourism operators in Sabah that prioritizes eco-tourism, cultural integration, and government partnerships, supported by conservation and financial backing, while maintaining operational efficiency and sustainability. This comprehensive approach positions Sabah as a leading eco-tourism destination, ensuring the growth and sustainability of its rural tourism sector.

Number of comparisons = 66
Consistency Ratio CR = 9.8%

Principal eigen value = 13.651
Eigenvector solution: 7 iterations, delta = 7.8E-8

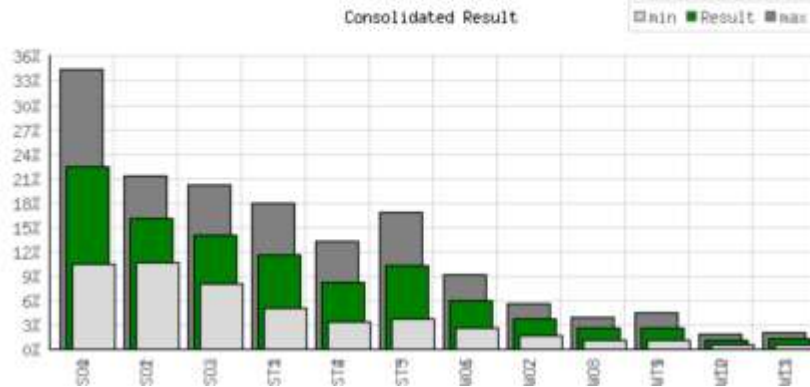


Figure 2: Consolidated Result

The provided chart and summary statistics from the Analytic Hierarchy Process (AHP) analysis offer a detailed view of the evaluation of various alternatives. The key metrics include the number of comparisons (66), Consistency Ratio (CR = 9.8%), Principal Eigenvalue (13.651) and Eigenvector solution convergence achieved in 7 iterations with a delta of 7.8E-8. These metrics are essential for validating the reliability and consistency of the AHP analysis.

The Analytic Hierarchy Process (AHP) analysis reveals insightful details about the performance of various alternatives. At the top, S01a stands out with an actual result of 21% and a maximum potential value of 34%, making it the most preferred and reliable choice for decision-making. Following closely are S02 and S03, with actual results of 18% and 15% and maximum potentials of 25% and 23%, respectively. These alternatives are significant contenders, demonstrating high performance and potential, thus being viable options alongside S01a.

In the middle tier, alternatives ST6, ST7a, and ST9 show actual results ranging from 10-12% with maximum values between 15-20%. These alternatives perform well, though not at the top level, making them suitable as backup or supplementary choices. W06, with an actual result slightly above 8% and a maximum potential of 13%, fits into this middle-tier category as a moderate option with decent performance.

The lower-tier alternatives, including W02 and W08, exhibit actual results of 5-6% and maximum values just under 10%. These alternatives are lower on the preference scale, suggesting they might require further analysis or could be deprioritized. At the bottom of the ranking are V07a, V11Q, and V11a, each showing actual results of 3-4% and maximum values up to 6%, indicating they are the least preferred and likely least viable options under the current analysis framework.

Key insights from the analysis highlight the dominance of S01a as the most preferred alternative, supported by its highest actual and potential scores. S02 and S03 also emerge as strong contenders with significant preference scores and potential. There is a noticeable gap between the top alternatives (S01a, S02, S03) and the mid to lower-tier alternatives,

underscoring the distinct advantage held by the top-tier options. The consistency of the results, validated by a Consistency Ratio of 9.8%, which is below the acceptable threshold of 10%, further supports the reliability of this analysis.

Based on these insights, it is recommended to focus on S01a, given its leading position and robust performance. S02 and S03 should also be considered as viable options, serving as effective alternatives or complements to S01a. Middle-tier alternatives like ST6, ST7a, and ST9 should be reviewed as backups or supplementary options due to their solid performance. Lower-tier alternatives, such as W02, W08, V07a, V11Q, and V11a, might need further investigation or could be deprioritized, given their lower preference scores. This comprehensive analysis guides decision-makers towards the most favourable options, ensuring a well-informed and systematic decision-making process.

Hence, this comprehensive analysis provides a clear understanding of the preferences and priorities among the evaluated alternatives, guiding decision-makers towards the most favourable options. The structured approach ensures that the decision-making process is well-informed, systematic, and aligned with the identified preferences.

Best Strategy for Rural Tourism Operators in Sabah Based on TOWS-AHP Analysis

The TOWS-AHP analysis of rural tourism in Sabah has provided a comprehensive framework for identifying the most impactful strategies to enhance and sustain the industry. Based on this analysis, the best strategy for rural tourism owners and operators is to promote eco-tourism by leveraging Sabah's natural resources (S01). This strategy emerged as the highest priority, underscoring its critical importance in attracting tourists and ensuring the long-term viability of rural tourism in the region.

Sabah is endowed with extraordinary natural beauty, including lush rainforests, diverse wildlife, and pristine landscapes. These natural resources are pivotal to positioning Sabah as a premier destination for eco-tourism. The strategy of leveraging these assets involves several key components: promoting unique natural attractions such as the Bornean rainforest, Mount Kinabalu, and the Kinabatangan River to draw eco-tourists seeking authentic nature-based experiences. Marketing efforts should emphasize the uniqueness and biodiversity of these sites, appealing to travellers interested in conservation and nature. Additionally, rural tourism operators should develop and offer eco-friendly activities like guided wildlife tours, bird watching, jungle trekking, and river cruises. These activities not only attract tourists but also educate them about the importance of conservation and sustainable tourism practices. To ensure the long-term sustainability of eco-tourism, it is essential to implement practices that minimize environmental impact, such as using renewable energy sources, reducing waste through recycling programs, and ensuring that tourism activities do not harm local ecosystems.

Besides, while leveraging natural resources is the core strategy, integrating cultural experiences can further enhance the appeal of eco-tourism packages. Sabah's rich cultural heritage, including the traditions and lifestyles of indigenous peoples, offers a unique dimension to the tourist experience. Operators can organize cultural tours and homestays where tourists can immerse themselves in the daily lives of local communities. This can include participating in traditional crafts, culinary experiences, and cultural performances, providing a holistic experience that combines nature and culture. Collaborating with indigenous communities to offer authentic cultural experiences not only enriches the tourist experience but also provides

economic benefits to these communities. It fosters a sense of ownership and participation among locals, ensuring that tourism development is inclusive and beneficial for all stakeholders.

Moreover, the strategy of partnering with government initiatives to boost online presence is also crucial. Effective online marketing is vital in today's digital age to reach a broader audience and attract more tourists. Working with government tourism boards to launch digital marketing campaigns can significantly increase visibility. Social media platforms, travel blogs, and online travel agencies can be leveraged to showcase Sabah's eco-tourism offerings to a global audience. Additionally, developing a strong online presence through well-designed websites, engaging social media profiles, and effective use of online travel agencies can help in attracting tech-savvy tourists who rely heavily on online information for travel planning. This comprehensive approach ensures that Sabah's eco-tourism potential is fully realized, drawing more visitors while preserving the natural and cultural heritage of the region.

The TOWS-AHP analysis clearly indicates that promoting eco-tourism by leveraging Sabah's natural resources is the best strategy for rural tourism owners and operators. By highlighting unique natural attractions, developing eco-friendly tourism activities, and integrating cultural experiences, rural tourism in Sabah can be significantly enhanced. Additionally, partnering with government initiatives to boost online presence can further amplify these efforts. This strategic focus not only attracts a global audience but also ensures the sustainability and resilience of Sabah's rural tourism industry, benefiting local communities and preserving the natural and cultural heritage of the region.

Conclusion

In conclusion, the TOWS-AHP analysis has provided valuable insights into the strategic priorities for rural tourism operators in Sabah. By leveraging Sabah's rich natural resources, promoting eco-tourism, integrating cultural experiences, and partnering with government initiatives to enhance online presence, rural tourism businesses can thrive sustainably. The analysis underscores the importance of a comprehensive approach that balances environmental conservation, cultural preservation, and economic viability. By adopting these strategies, rural tourism operators can attract more visitors, contribute to the local economy, and ensure the long-term sustainability of Sabah's tourism industry.

Acknowledgements: The author would like to express heartfelt appreciation to all parties who have supported and contributed to the completion of this research article. Deepest gratitude is extended to Universiti Malaysia Sabah (UMS) for providing continuous academic support, research facilities and an encouraging environment throughout the study. Special thanks go to the supervisors, lecturers and academic advisors for their insightful feedback, critical review and constructive suggestions that significantly enriched the quality of this paper. Author gratefully acknowledges the cooperation and participation of all respondents who generously shared their time and input to making this research possible. Their contributions are highly valued and appreciated. Lastly, the author wishes to thank the editorial team and anonymous reviewers of this journal for their time, effort and helpful comments in improving the journal article. The author hope that this paper contributes positively to the growing body of knowledge and serves as a useful reference for future research.

Funding Statement: No Funding

Conflict of Interest Statement: The authors declare that there is no conflict of interest regarding the publication of this paper. Author have contributed to this work and approved the final version of the manuscript for submission to the Journal of Tourism, Hospitality and Environment Management (JTHER).

Ethics Statement: This study was conducted in accordance with ethical research standards. Informed consent was obtained from all participants prior to data collection. Participation was voluntary, and respondents were assured of confidentiality and anonymity. The data collected were used solely for academic purposes.

Author Contribution Statement: The author contributed significantly to the development of this manuscript. Author was responsible for the conceptualization, methodology, and overall supervision of the study, handled data collection, analysis, and interpretation of results. Besides, contributed to the literature review, drafting, and critical revision of the manuscript. The author read and approved the final version of the manuscript prior to submission.

References

- Bajrami, D. D., Radosavac, A., Cimbaljević, M., Tretiakova, T. N., & Syromiatnikova, Y. A. (2020). Determinants of Residents' support for Sustainable tourism development: Implications for Rural communities. *Sustainability*, 12(22), 9438. <https://doi.org/10.3390/su12229438>
- Chan, M. (2020). Ecotourism in Sabah: Opportunities and Challenges. *Journal of Sustainable Tourism*, 28(4), 567-582. DOI: 10.1080/09669582.2020.1742181
- Danting, Z., Quoquab, F., & Mahadi, N. (2018). Enhancing the tourism operation success in Sabah Malaysia: A conceptual framework. *International Journal of Engineering & Technology*, 7(3.21), 147-150. <https://doi.org/10.14419/ijet.v7i3.21.17151>
- Dasan, J., et al. (2022). "Challenges in developing rural tourism infrastructure."
- Estes, J. G., Othman, N., Ismail, S., Ancrenaz, M., Goossens, B., Ambu, L. N., & Pal P. A. (2012). Quantity and configuration of available elephant habitat and related conservation concerns in the Lower Kinabatangan floodplain of Sabah, Malaysia. *PloS One*, 7(10), e44601. <https://doi.org/10.1371/journal.pone.0044601>
- Getz, D., & Carlsen, J. (2000). Characteristics and goals of family and owner-operated businesses in the rural tourism and hospitality sectors. *Tourism Management*, 21(6), 547–560. [https://doi.org/10.1016/s0261-5177\(00\)00004-2](https://doi.org/10.1016/s0261-5177(00)00004-2)
- Hanafiah, M. H., Jamaluddin, M. R., & Zulkifly, M. I. (2013). Local Community Attitude and Support towards Tourism Development in Tioman Island, Malaysia. *Procedia - Social and Behavioral Sciences*, 105, 792-800. DOI: 10.1016/j.sbspro.2013.11.083
- Latip, N. A., Marzuki, A., and Pimid, M. (2019). Rural tourism in Malaysia. In J. Mastura, M. Azizan, & A. Shardy (Eds), *Conservation and tourism development towards a sustainable rural community in Lower Kinabatangan Sabah* (pp. 101-117). Universiti Sains Malaysia.
- Liu, C., Dou, X., Li, J., & Cai, L. A. (2020). Analyzing government role in rural tourism development: An empirical investigation from China. *Journal of Rural Studies*, 79, 177–188. <https://doi.org/10.1016/j.jrurstud.2020.08.046>
- López-Sanz, J. M., Penelas-Leguía, A., Gutiérrez-Rodríguez, P., & Cuesta-Valiño, P. (2021). Sustainable development and rural tourism in depopulated areas. *Land*, 10(9), 985.
- Malaysia Productivity Corporation. (2021). *Enhancing Rural Tourism through Skills Development*. Retrieved from <https://www.mpc.gov.my>
- Pimid, M., Latip, N. A., Marzuki, A., Umar, M. U., & Krishnan, K. T. (2020). Stakeholder management of conservation in Lower Kinabatangan Sabah. *Planning Malaysia*, 18(13), 71- 81
- Ristić, D., Vukočić, D., & Milinčić, M. (2019). Tourism and sustainable development of rural settlements in protected areas - Example NP Kopaonik (Serbia). *Land Use Policy*, 89, 104231. <https://doi.org/10.1016/j.landusepol.2019.104231>
- Rosalina, P. D., Dupre, K., & Wang, Y. (2021). Rural tourism: A systematic literature review on definitions and challenges. *Journal of Hospitality and Tourism Management*, 47, 134–149. <https://doi.org/10.1016/j.jhtm.2021.03.001>
- Ruiz-Real, J. L., Uribe-Toril, J., De Pablo Valenciano, J., & Gázquez-Abad, J. C. (2020). Rural tourism and development: Evolution in Scientific Literature and Trends. *Journal of Hospitality & Tourism Research*, 46(7), 1322-1346. <https://doi.org/10.1177/1096348020926538>

Sabah Tourism Board. (2023). *Rural Tourism Development Plan*. Retrieved from <https://www.sabahtourism.com>

Wilson, S., Fesenmaier, D. R., Fesenmaier, J., & Van Es, J. C. (2001). Factors for success in rural tourism development. *Journal of Travel research*, 40(2), 132-1