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Evaluating the Impacts of Community-Based Tourism on Sustainable Development: A Case Study of Darau Wetland Eco-Tourism, Sabah, Malaysian Borneo

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Abstract

This study explores the impacts of community-based tourism (CBT) on the well-being of residents in Darau Wetland Eco-Tourism, located in Sabah, Malaysia. Using a concurrent mixed-methods approach, both quantitative surveys ($n = 33$) and qualitative interviews with key informants were conducted to assess the sociocultural, economic, and environmental outcomes. The findings show that tourism has enhanced cultural pride, diversified income, and increased environmental awareness, with initiatives such as mangrove rehabilitation and waste management promoting collective stewardship. While challenges like limited capital and seasonal income persist, the community perceives the benefits of tourism to outweigh the drawbacks, with high ratings for social cohesion and cultural satisfaction. Environmental management and development control were identified as key priorities for sustainability. The study concludes that Darau's eco-tourism model illustrates how community-driven initiatives can simultaneously promote livelihood improvement and conservation, contributing to sustainable regional development in emerging tourism areas.

Keywords: Community-based tourism; eco-tourism; sustainable development; Sabah; inclusivity

1. Introduction

Darau Wetland Eco-Tourism, located near Kota Kinabalu, Sabah, represents one of the emerging eco-tourism destinations in northern Borneo. Characterized by its unique wetland ecosystem and rich biodiversity, the area serves as both a habitat for various flora and fauna and a living space for the Bajau Samah community, whose livelihoods are closely tied to the surrounding natural environment. In recent years, the site has gained attention as part of broader efforts by the Kota Kinabalu City Hall (DBKK) and Universiti Malaysia Sabah (UMS) to promote eco-tourism as a tool for sustainable regional development (The Borneo Post, 2025). This initiative reflects Malaysia's ongoing transition towards community-based tourism (CBT) models that emphasize local participation, cultural preservation, and environmental stewardship.

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Across Malaysia and Southeast Asia, community-based eco-tourism has been increasingly recognized for its potential to enhance rural livelihoods while contributing to conservation and cultural continuity (Ibrahim et al., 2025). Studies have shown that tourism can improve local income opportunities, strengthen community pride, and foster greater appreciation for environmental protection (Kunjuraman, 2022). However, unregulated growth can also result in ecological degradation, cultural commodification, and unequal distribution of benefits. The sustainability of such initiatives therefore depends on effective governance, equitable participation, and continuous assessment of their socio-economic and environmental impacts (Conradie, 2019; Croes & Rivera, 2017; Voronkova et al., 2021).

In the context of Sabah, existing research on eco-tourism has primarily focused on well-established destinations such as Kinabalu geopark (Dousin et al., 2024; Rasoolimanesh et al., 2018). Comparatively little attention has been given to smaller wetland-based communities such as Darau, despite their ecological significance and increasing involvement in tourism. This lack of empirical data limits policymakers' ability to design evidence-based strategies for sustainable development in the area.

To address this gap, the present study assessed the impacts of community-based tourism in Darau Wetland Eco-Tourism from the perspective of local residents. Specifically, it examined how tourism development influences the community's socio-cultural, economic, and environmental well-being, while identifying the challenges and opportunities that arise in the process. The study also explored community priorities for sustainable tourism management to inform future policy directions for DBKK and other stakeholders.

The specific objectives were:

- 1) To evaluate the sociocultural, economic, and environmental impacts of community-based tourism on the well-being of residents in Darau Village.
- 2) To examine the challenges associated with community-based tourism and how they influence local participation and sustainability.
- 3) To identify and rank community priorities for sustainable tourism development in Darau Wetland Eco-Tourism.

2. Methodology

2.1 Item development

The internal consistency of the constructs was assessed using Cronbach's alpha as shown in Table 2.1.

Table 2.1. Item reliability for each construct (n=33)

Construct items	Number of items	Cronbach's alpha coefficient	Interpretation
Sociocultural benefit	5	0.861	High reliability
Economic benefit	3	0.789	High reliability
Environmental benefit	3	0.939	Excellent reliability
Sociocultural challenges	6	0.824	High reliability
Economic challenges	8	0.887	High reliability

Environmental challenges	4	0.689	High reliability
Community well-being	8	0.923	Excellent reliability

According to Hinton et al. (2014), values above 0.90 indicate excellent reliability, between 0.70–0.89 indicate high reliability, 0.50–0.69 reflect moderate reliability, and values below 0.50 suggest low reliability. The findings show that most constructs achieved high to excellent reliability, demonstrating strong internal consistency among the items. Specifically, sociocultural benefit ($\alpha = 0.861$), economic benefit ($\alpha = 0.789$), sociocultural challenges ($\alpha = 0.824$), economic challenges ($\alpha = 0.887$), and environmental challenges ($\alpha = 0.689$) fall within the high reliability range. Although environmental challenges ($\alpha = 0.689$), are at the lower boundary that might happen caused by smaller sample size (Toro et al., 2022), it is still acceptable for basic research but not for clinical decision making (Rocha & Lenz, 2023). Meanwhile, environmental benefit ($\alpha = 0.939$) and community well-being ($\alpha = 0.923$) both demonstrated excellent reliability, indicating that the items in these constructs are very consistent in measuring their respective dimensions. Overall, the results confirm that the measurement scales employed in this study are reliable and valid for further analysis, with no construct falling below the acceptable threshold.

2.2 Study Area

The study was conducted in Darau Wetland Eco-Tourism, located near Kota Kinabalu, Sabah, Malaysia. The area forms part of the Darau wetland, a wetland ecosystem that supports diverse flora and fauna and provides vital ecological services such as water regulation, habitat provision, and local climate moderation. The surrounding community, predominantly of Bajau Samah ethnicity, has traditionally relied on fishing, small-scale farming, and artisanal activities. In recent years, the site has been developed as a community-based eco-tourism destination under the coordination of Dewan Bandaraya Kota Kinabalu (DBKK), aiming to integrate livelihood enhancement with environmental conservation.

2.3 Research Design

This study adopted a concurrent mixed-method approach, integrating qualitative and quantitative techniques to capture a holistic understanding of tourism impacts on community well-being (Creswell & Plano Clark, 2023). Both strands of data were collected and analysed simultaneously to allow for direct comparison and mutual validation of findings. The quantitative component comprised a structured questionnaire survey administered to a broader group of residents to measure and rank perceived tourism impacts and levels of community satisfaction. At the same time, the qualitative component involved semi-structured interviews with key informants, including tourism operators, community leaders, and residents, to obtain in-depth narratives on the socio-cultural, economic, and environmental implications of tourism development.

2.4 Data Collection

Fieldwork was conducted from 13th to 17th September 2025 in Darau Village, Sabah. Both qualitative and quantitative data were collected concurrently during this period to obtain complementary insights into tourism development and its implications for community well-being. The qualitative component involved semi-structured interviews with selected participants, guided by an interview protocol focusing on the perceived benefits and challenges of tourism, changes in lifestyle, and attitudes toward sustainability. Participants included local residents, tourism operators, and community representatives directly involved in tourism-related activities. Simultaneously, the quantitative component employed a structured questionnaire survey distributed to 33 residents. The instrument comprised five main sections namely Demographic information, Perceived benefits of tourism (sociocultural, economic, environmental), Perceived challenges of tourism (sociocultural, economic, environmental), Community

well-being indicators, Sustainability priorities for tourism development. All items were measured using a five-point Likert scale, while the final section required respondents to rank key priority areas for sustainable tourism management. This parallel data collection process ensured that perceptions captured through interviews and surveys were contextually aligned, allowing for real-time triangulation and richer interpretation of community perspectives.

2.5 Data Analysis

Data analysis involved both qualitative and quantitative techniques, conducted concurrently to ensure that insights from one dataset informed and complemented the other throughout the interpretation process. The qualitative data, derived from semi-structured interviews, were analysed using thematic analysis in Atlas.ti (version 8). Coding was carried out inductively to identify recurring patterns and perceptions related to tourism impacts. Emerging themes were then categorised under three major dimensions of community well-being: socio-cultural, economic, and environmental. This approach enabled the identification of nuanced community perspectives regarding both the benefits and challenges of tourism development. The quantitative data, obtained from the structured questionnaire, was analysed using IBM SPSS Statistics (Version 28). Descriptive statistics (mean, frequency, and percentage) were used to summarise demographic characteristics and response distributions. Reliability analysis was conducted using Cronbach's alpha, with values ranging from 0.689 to 0.939, indicating high to excellent internal consistency across all constructs. Findings from both analyses were integrated during interpretation to establish convergence and divergence between qualitative insights and quantitative trends. This concurrent integration provided a comprehensive understanding of how community-based tourism in Darau Village influences socio-economic well-being, cultural preservation, and environmental sustainability.

3. Findings

3.1 Demographic characteristic

A total of 33 respondents from Darau Village participated in the survey. Table 3.1. presents their demographic characteristics. The sample comprised slightly more women (54.5%) than men (45.5%), indicating balanced participation across genders as shown in Table 2. Most respondents were within the productive age group of 26–60 years (75.7%), with a smaller proportion of youths aged 18–25 years (18.2%) and elders above 60 years (6.1%). This distribution reflects an active, mature population engaged in tourism and community development activities. In terms of education, the majority had completed secondary school (66.7%), followed by diploma or foundation-level qualifications (24.2%). Only a few respondents possessed primary education (6.1%) or a bachelor's degree (3.9%). This suggests that while formal education levels are modest, most community members possess basic literacy and learning capacity to engage in tourism enterprises and conservation awareness programs. Occupationally, about one-third were not employed (33.3%), while 21.2% were self-employed, 18.2% worked in government service, 18.2% in private sectors, and 9.1% were retired. This indicates a mix of informal and formal livelihoods, typical of semi-rural communities transitioning toward service-based activities through tourism. The income profile shows that the majority earned below RM4,850 per month, with 45.5% in the RM2,501–4,850 range and 33.3% earning below RM2,500. Only one respondent reported earnings above RM10,970. This confirms that Darau Village is primarily a lower- to middle-income community. Regarding tourism participation, 45.5% of respondents reported generating some income from tourism activities, indicating that tourism contributes to household income but is not yet the dominant livelihood source. Culturally, the village is largely homogeneous, with 81.8% Bajau Samah, and all respondents identifying as Muslim (100%). Most have lived in the village for

over 20 years (84.8%), and nearly all own their homes (93.9%). Every respondent expressed pride in being born and raised in Darau, reflecting strong place attachment and community identity.

Table 3.1. Demographic of respondent (n=33)

Items	Frequency, n	Percentage, %
Gender		
Men	15	45.5
Women	18	54.5
Age		
18-25 Years	6	18.2
26-40 Years	10	30.2
41-60 Years	15	45.5
Lebih 60 Years	2	6.1
Education Level		
Primary School	2	6.1
Secondary School	22	66.7
Diploma/Foundation/STPM/level	8	24.2
Bachelor's Degree	1	3.9
Occupation		
Government Servant	6	18.2
Private	6	18.2
Retired	3	9.1
Self Employed	7	21.2
Not working	11	33.3
Monthly Income		
Below RM2500	11	33.3
RM2501 - RM4850	15	45.5
RM4851-RM10,970	6	18.2
Above RM10,971	1	3.0
Generation of income from tourism?		
Yes	15	45.5
No	18	54.5
Ethnics		
Bajau Samah	27	81.8
Malay	3	9.1
Kadazan	1	3.0
Dusun	1	3.0
Murut	1	3.0
Religion		
Islam	33	100
Duration stays in the village		
1-5 years	1	3.0
11-20 years	4	12.1
More than 20 years	28	84.8

House ownership status			
Own House	31	93.9	
Others (In law house)	2	6.1	
Do you feel proud to be born and raised in this village?			
Yes	100	100	

Table 3.1.1. shows the list of selected key informants of Kampung Dara interviewed in different individual sessions where both of them are senior villagers and have first knowledge on the village tourism development.

Table 3.1.2. List of key Informants (n=2)

Key Informant (K)	Gender	Role	Managed area
K1	Male	Village Head	Village
K2	Male	Darau wetland homestay coordinator	Tourism

3.2 Sociocultural Benefits of Tourism Development

The analysis (Table 3.2) reveals that respondents generally perceived tourism development as having a positive sociocultural impact on Darau Village. All five items recorded high mean scores (between 4.34 and 4.62), indicating strong agreement across the community. The highest-rated aspect was “preserving and promoting local traditions and cultural heritage” ($M = 4.62$, $SD = 0.492$), suggesting that tourism is seen as an important driver in safeguarding cultural identity. This is followed by “enhancing community pride and identity through cultural events and activities” ($M = 4.53$, $SD = 0.567$), reflecting how tourism initiatives strengthen local solidarity and pride of place. Other notable benefits include facilitating cultural exchange and understanding between residents and visitors ($M = 4.41$, $SD = 0.712$) and improving foreign language skills among villagers ($M = 4.37$, $SD = 0.793$), both highlighting tourism’s role in broadening horizons and fostering learning opportunities. Lastly, respondents also agreed that tourism enhances community relations by bringing people closer together ($M = 4.34$, $SD = 0.701$), reinforcing its unifying effect.

Table 3.2. Sociocultural Benefits of Tourism Development

Tourism development has positively impacted the sociocultural aspects of Darau Village by:	Mean	Mean interpretation	Std. Deviation
Preserving and promoting local traditions and cultural heritage.	4.62	High	0.492
Facilitating cultural exchange and understanding between residents and visitors.	4.41	High	0.712
Enhancing community pride and identity through cultural events and activities.	4.53	High	0.567
Tourism can improve foreign language skills to villagers.	4.37	High	0.793
Tourism development has enhanced community relations, especially in bringing closer groups of people living apart from each other.	4.34	High	0.701

(Low = 1.00–2.49, Moderate = 2.50–3.49, High = 3.50–5.00).

Overall, the results suggest that tourism in Darau Village extends beyond its economic value, acting as a cultural catalyst that reinforces community identity and social connection. High mean scores across all sociocultural

indicators reflect a collective perception that tourism has strengthened the village's sense of pride and belonging (Rodrigues et al., 2021, Ibrahim et al., 2023). The most notable aspect which is *preserving and promoting local traditions and cultural heritage* highlights how community-based tourism serves as a medium for maintaining cultural continuity. These quantitative patterns are further illuminated by the qualitative insights, where informants described tourism as a source of local pride and differentiation from neighbouring villages.

According to the homestay coordinator,

"We feel proud because through tourism, our village stands out from other. We are fortunate to have such a unique mangrove ecosystem" (K2)

The village head echoed this sentiment, stating,

"We are happy because now when people mention Darau, it is known as Darau Wetland. This initiative began with the Environment Department and UMS working together with DBKK" (K1).

These testimonies reinforce the quantitative results, showing that tourism functions not merely as an economic venture but also as a cultural vehicle that enhances community pride and social cohesion.

3.3 Economic Benefits of Tourism Development

Tourism development was also perceived to have a positive economic impact on the community in Darau Village (Table 3.3). All three items recorded high mean scores, ranging from 4.28 to 4.59, reflecting strong agreement among respondents. The highest-rated benefit was "generating income for local businesses, artisans, and service providers" ($M = 4.59$, $SD = 0.615$). This suggests that tourism contributes directly to the village economy, particularly for those engaged in small-scale enterprises and services. Similarly, "creating job opportunities for villagers in tourism-related sectors" ($M = 4.50$, $SD = 0.718$) was also rated highly, underscoring tourism's role in employment generation. Finally, respondents agreed that tourism contributes to "diversifying the local economy and reducing dependency on traditional livelihoods" ($M = 4.28$, $SD = 0.772$), showing its importance in broadening income sources and supporting community resilience.

Table 3.3. Environmental Benefits of Tourism Development

Tourism development has positively influenced the environmental aspects of Darau Village by:	Mean	Mean interpretation	Std. Deviation
Promoting conservation efforts and environmental stewardship among residents and visitors.	4.55	High	0.624
Supporting sustainable practices such as waste management and resource conservation.	4.39	High	0.667
Preserving natural habitats and biodiversity in the village and surrounding areas. (Low = 1.00–2.49, Moderate = 2.50–3.49, High = 3.50–5.00).	4.58	High	0.620

Overall, the findings underscore tourism as an important driver of local economic well-being, enhancing both household income and the wider village economy. High mean scores across all items indicate strong agreement

that tourism has become a meaningful livelihood source through new employment and micro-enterprise opportunities. These results reflect how community-based tourism has diversified income streams and reduced reliance on traditional livelihoods. The quantitative evidence is further supported by qualitative accounts, where respondents described tourism as creating tangible opportunities for guiding, catering, and small-scale entrepreneurship within the community (Makwindi & Ndlovu, 2021, Mohd Zainol et al., 2025).

This interpretation is supported by one of the Informant that explained,

“Many community members are involved — some are boat operators, others act as guides, and we also have cultural houses where people prepare local snacks and cater for visitors” (K2).

Similarly, the village head emphasized the economic potential of mangrove nurseries:

“We have a nursery where villagers collect mangrove seedlings and grow them... it provides some income for the community” (K1).

These findings confirm that community-based tourism has expanded livelihood options while maintaining local ownership.

3.4 Environmental Benefits of Tourism Development

The findings (Table 3.4) also indicate that tourism development has had a positive influence on the environmental aspects of Darau Village. All three indicators recorded high mean scores (4.39–4.58), reflecting widespread agreement among respondents on tourism’s role in supporting environmental sustainability. The highest-rated aspect was “preserving natural habitats and biodiversity in the village and surrounding areas” ($M = 4.58$, $SD = 0.620$). This suggests that residents strongly perceive tourism as a driver of biodiversity protection. Similarly, “promoting conservation efforts and environmental stewardship among residents and visitors” ($M = 4.55$, $SD = 0.624$) scored highly, indicating that tourism fosters a sense of shared responsibility for the environment. Meanwhile, “supporting sustainable practices such as waste management and resource conservation” ($M = 4.39$, $SD = 0.667$) was also positively rated, reflecting recognition of tourism’s role in encouraging more responsible resource use and community-led waste initiatives.

Table 3.4. Environmental Benefits of Tourism Development

Tourism development has positively influenced the environmental aspects of Daraau Village by:	Mean	Mean interpretation	Std. Deviation
Promoting conservation efforts and environmental stewardship among residents and visitors.	4.55	High	0.624
Supporting sustainable practices such as waste management and resource conservation.	4.39	High	0.667
Preserving natural habitats and biodiversity in the village and surrounding areas.	4.58	High	0.620

(Low = 1.00–2.49, Moderate = 2.50–3.49, High = 3.50–5.00)

Overall, the results indicate that tourism in Darau Village contributes not only to cultural and economic vitality but also to environmental stewardship. High mean scores across all indicators show strong community awareness of the link between tourism and environmental protection. Residents perceive tourism as fostering shared responsibility for conserving natural habitats and managing local resources more sustainably similar to past studies on community perception on tourism activity in managing environmental protection (Obradović, 2024). These quantitative findings are reinforced by qualitative reflections, where informants described collective efforts such as mangrove replanting and waste management as key outcomes of eco-tourism development.

As expressed by the informant,

“We have always cared for our environment... from there came the idea of tourism that promotes environmental care” (K1).

Another informant recalled,

“After the river expansion project, we replanted the mangroves with help from the Rotary Club for about 12,000 trees and now the birds and fireflies have returned” (K2)

These statements illustrate a strong connection between community participation and ecosystem restoration. The quantitative results, which show high agreement with statements such as *preserving biodiversity* and *promoting conservation efforts*, confirm that Darau residents perceive eco-tourism as a legitimate tool for environmental renewal and education.

3.5 Sociocultural Challenges of Tourism Development

While tourism has brought many benefits, respondents also identified several sociocultural challenges in Darau Village (Table 3.5). However, the results suggest that these challenges are relatively limited in intensity, with most items rated as low concerns. The only aspect that scored in the moderate range was “changes in social dynamics and community cohesion” ($M = 2.81$, $SD = 1.400$), indicating that some villagers perceive tourism as slightly reshaping traditional community relationships. All other items were rated low, including “diminished neighbourliness” ($M = 1.55$, $SD = 0.888$), “erosion of traditional values and cultural practices” ($M = 1.58$, $SD = 0.720$), and “conflicts between residents and tourists over cultural appropriation or misinterpretation” ($M = 1.71$, $SD = 0.824$). Similarly, concerns that villagers feel disturbed by living in a tourism destination ($M = 1.52$, $SD = 0.724$) or that they are more likely to migrate due to tourism impacts ($M = 1.65$, $SD = 0.755$) were also rated low.

Table 3.5. Sociocultural Challenges of Tourism Development

Tourism development has brought sociocultural challenges to Darau Village, including:	Mean	Mean interpretation	Std. Deviation
Changes in social dynamics and community cohesion.	2.81	Moderate	1.400
Tourism cause neighbourliness to be diminished.	1.55	Low	0.888
Erosion of traditional values and cultural practices.	1.58	Low	0.720

Conflicts between residents and tourists over cultural appropriation or misinterpretation.	1.71	Low	0.824
Villagers feel disturbed by living in a village which is a destination for tourism.	1.52	Low	0.724
Villagers is more likely to migrate to other places due to the current impact of tourism development.	1.65	Low	0.755

(Low = 1.00–2.49, Moderate = 2.50–3.49, High = 3.50–5.00).

These findings suggest that while tourism has introduced some degree of social adjustment particularly in how community members interact and organise collective activities. It has not generated major sociocultural conflict. Instead, the community appears adaptable and resilient, maintaining its social values while integrating new tourism practices. The survey results are consistent with qualitative insights, where informants acknowledged minor shifts in participation and lifestyle but emphasised that tourism has largely strengthened rather than disrupted community relationships.

Although tourism brought visible sociocultural benefits, a few minor challenges were reported. According to K2,

“At first, many young people joined the cooperative, but some found tourism work difficult or inconsistent with their daily jobs, so participation declined” (K2).

Conversely, the village head noted a positive transformation:

“Before, many villagers were shy to speak, but now they are more confident because they interact with tourists” (K1)

This balance between adaptation and limitation explains why only changes in community cohesion scored moderately while other concerns, such as erosion of traditional values, were rated low. It indicates that Darau’s community is socially resilient and capable of adjusting to change without losing cultural authenticity.

3.6 Economic Challenges of Tourism Development

The results (Table 3.6) indicate that respondents in Darau Village generally perceive the economic challenges of tourism development to be low. Mean scores for all items fell within the low range (1.81–2.39), suggesting that while challenges exist, they are not considered major threats to the community’s economic stability. The relatively higher concerns included “seasonal fluctuations in income and employment opportunities” ($M = 2.39$, $SD = 0.882$) and “the high capital requirements for local entrepreneurs to develop the tourism sector” ($M = 2.39$, $SD = 0.955$). These findings highlight the structural difficulties of sustaining income year-round and the financial barriers that small-scale entrepreneurs face when trying to compete in the tourism market. Other aspects such as lack of specialized business or marketing skills ($M = 2.10$, $SD = 0.978$) and difficulties in selling products in a tourist transit area ($M = 2.10$, $SD = 0.944$) were also acknowledged but still rated low overall. Similarly, concerns about low returns from tourism-related investment ($M = 2.35$, $SD = 1.142$), disparities in benefit distribution ($M = 1.81$, $SD = 0.654$), and challenges in meeting product quality or service expectations ($M = 1.84$, $SD = 0.898$) were considered less significant.

Table 3.6. Economic Challenges of Tourism Development

Tourism development has posed economic challenges for the community in Darau Village, such as:	Mean	Mean interpretation	Std. Deviation
Disparities in economic benefits distribution among residents.	1.81	Low	0.654
Inflation of prices and cost of living due to increased tourism demand.	1.87	Low	0.806
Seasonal fluctuations in income and employment opportunities.	2.39	Low	0.882
The capital required to develop the local tourism sector is large and beyond the affordability of local entrepreneurs.	2.39	Low	0.955
Individuals who work with tourism in this village usually do not have specialized skills in business as an effective marketing.	2.10	Low	0.978
Tourism in this village led to internal investment where there is a business enterprise and job creation, but the returns are low.	2.35	Low	1.142
Local communities find it difficult to sell their products as the village is a tourist transit area.	2.10	Low	0.944
Local communities find it difficult to reach the level of product quality and good service expected by tourists.	1.84	Low	0.898

Overall, the results indicate that while certain economic challenges persist such as sustaining income stability, securing capital, and enhancing entrepreneurial capacity these are not viewed as serious obstacles by most residents. Instead, the community perceives such issues as manageable within the current tourism framework. This suggests that the economic benefits of tourism clearly outweigh its drawbacks, reflecting a positive cost–benefit balance at this early stage of development (Kaewchuay & Kitcharoen, 2021). Qualitative perspectives further support this view, as informants described ongoing efforts to strengthen cooperative management and ensure that tourism opportunities remain within community control.

Economic constraints were perceived as minor ($M = 1.81\text{--}2.39$). Respondents cited limited capital and small-scale infrastructure as the main barriers rather than income inequality.

As informant observed,

“Tourism here is still limited — we have river cruises and homestays, but not many people are involved yet”
(K1).

Another informant expanded on this issue:

“If large companies take over, villagers will gain nothing. It is better that we manage tourism together as a community” (K2).

These insights align with the quantitative findings that economic challenges remain low but persistent. The community values self-governed tourism and rejects heavy external control such a stance that supports sustainable, locally driven growth.

3.7 Community Views on the Net Impact of Tourism Development

The results (Table 3.7) show that, overall, the community perceives the benefits of tourism development to outweigh its challenges ($M = 3.42$, $SD = 0.848$). This score falls within the moderate range but is close to the threshold of high, suggesting that while most residents recognize positive contributions of tourism to their well-being, they do so with some caution. The moderate spread of responses indicates variation in perceptions—some villagers see tourism as highly beneficial, while others are more reserved, likely due to uneven distribution of economic opportunities or concerns over environmental impacts.

Table 3.7. Community Views on the Net Impact of Tourism Development

Benefits of tourism development outweigh the challenges	Mean	Mean interpretation	Std. Deviation
Overall, the benefits of tourism development outweigh the challenges for community well-being in Darau Village.	3.42	Moderate	0.848

(Low = 1.00–2.49, Moderate = 2.50–3.49, High = 3.50–5.00).

3.8 Community Well-Being Indicators in Darau Village

The Community Well-Being Indicators in Darau Village (Table 3.8) was generally rated positively by respondents, with most indicators receiving high satisfaction scores. The highest mean values were recorded for satisfaction with community life ($M = 4.39$, $SD = 0.615$) and interpersonal relations within the community ($M = 4.39$, $SD = 0.715$), suggesting a strong sense of belonging and cohesion among villagers. Similarly, satisfaction with cultural aspects ($M = 4.32$, $SD = 0.791$) further reflects the importance of sociocultural identity in sustaining community pride. Moderate to high levels of satisfaction were also reported for education ($M = 4.00$, $SD = 0.856$), services and facilities ($M = 4.00$, $SD = 0.775$), and the environment ($M = 4.10$, $SD = 1.076$), indicating that while these areas are generally perceived positively, there may still be room for improvement, particularly in infrastructure and environmental management. Economic satisfaction, as reflected by income ($M = 3.94$, $SD = 0.772$), was rated slightly lower than social and cultural dimensions, suggesting that financial well-being remains a concern for some villagers. The only indicator with a moderate level of satisfaction was political representation ($M = 3.42$, $SD = 0.848$), pointing to possible gaps in governance or community participation in decision-making processes.

Table 3.8. Community Well-Being Indicators in Darau Village

Community Well-being	Mean	Mean interpretation	Std. Deviation
Are you satisfied with the people who live in this community?	4.39	High	0.715
Are you satisfied with the life of your community?	4.39	High	0.615
Are you satisfied with your monthly income?	3.94	High	0.772
Are you satisfied with the education provided to the children in your area?	4.00	High	0.856
Are you satisfied with the services and facilities you get in this community?	4.00	High	0.775
Are you satisfied with the culture of the community in your village?	4.32	High	0.791
Are you satisfied with the environment in your community (air, water, land)?	4.10	High	1.076

Are you satisfied with the political representation in your area? (Low = 1.00–2.49, Moderate = 2.50–3.49, High = 3.50–5.00).	3.42	Moderate	0.848
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Overall, the results show that community well-being in Darau Village is perceived positively, with most indicators recording high satisfaction levels. Residents expressed strong contentment with their social relationships and community life, reflecting a deep sense of belonging and cohesion. High satisfaction with cultural identity further underscores the role of tourism in reinforcing collective pride and shared traditions (Zhang et al., 2021; Ibrahim et al., 2019). These quantitative findings are consistent with qualitative accounts, where participants described how tourism has strengthened community spirit and mutual support while also highlighting aspirations for broader participation in local decision-making.

The village head reflected,

“People here are happy... things have changed for the better since the tourism programme began” (K1).

En. Sudin observed how social unity strengthened over time:

“Those who once doubted the project now support it — we didn’t argue, we showed results through our actions” (K2).

These findings mirror the quantitative data showing high satisfaction with community relations, culture, and environment, though slightly lower satisfaction with income and political representation. The evidence suggests a community that enjoys strong social cohesion and cultural vitality, even as it seeks improved economic and governance support.

3.9 Priority Ranking of Sustainable Tourism Development Aspects in Darau Village

The priority ranking results (Table 3.9) shows the ranking of priority perceived by the respondent on sustainable tourism development.

Table 3.9. Priority Ranking of Sustainable Tourism Development Aspects in Darau Village

Items	Mean Rank	Std. Deviation	Ranking
Development control	3.94	3.316	1
Solid waste management	4.35	2.702	2
Sewage treatment wastewater management	4.84	2.609	3
Drinking water quality	4.87	1.821	4
Water availability and conservation	5.19	2.227	5
Controlling use intensity	5.23	3.432	6
Energy management	7.39	4.256	7

Local satisfaction with tourism	7.80	2.833	8
Sustaining tourist satisfaction	7.83	2.842	9
Economic benefits of tourism	8.23	2.725	10
Effects of tourism on communities	8.57	2.897	11
Tourism seasonality	8.67	2.893	12

(1 = Highest priority to 12 = Lowest priority)

Overall, the results indicate that environmental management and regulatory control are viewed as the most critical elements of sustainable tourism in Darau Village. Development control ranked as the top priority, followed closely by solid waste and wastewater management, reflecting residents' awareness of the need to regulate growth and protect natural resources. Other environmental aspects such as water quality and conservation were also rated highly, underscoring a strong local commitment to ecological sustainability. In contrast, issues linked to economic gains or tourism seasonality were considered less urgent, suggesting that the community prioritises long-term environmental governance over short-term financial outcomes. This perspective is consistent with qualitative accounts, where participants highlighted DBKK's ongoing environmental initiatives and the community's shared responsibility in maintaining a clean and resilient wetland ecosystem.

Respondents ranked development control, solid-waste management, and wastewater treatment as their top sustainability priorities, emphasising environmental regulation over short-term financial gains.

As stated by the village head,

"We hope the government can help expand our facilities, especially the cultural house, so that visitors have more to see and experience" (K1).

Another informant added,

"DBKK has now built a barrier to prevent rubbish from entering the river, and staff clear it every morning and evening" (K2).

These statements correspond with the quantitative ranking results, showing that Darau residents view environmental governance and infrastructure as the foundation for sustainable tourism. Their forward-looking attitudes demonstrate an understanding that conservation is integral to long-term prosperity.

4. Conclusion, caveat and implication.

The study achieved its objectives by evaluating the sociocultural, economic, and environmental impacts of community-based tourism in Darau Village, revealing that tourism has enhanced local pride, strengthened cultural identity, diversified income sources, and fostered environmental stewardship through community-led initiatives such as mangrove rehabilitation and waste management. Although several structural challenges were identified mainly

limited capital, seasonal income, and uneven participation which they were not perceived as major barriers, reflecting the community's adaptability and collective resilience in managing tourism growth. The priority ranking further showed that residents place the greatest importance on development control, solid waste management, and wastewater treatment, demonstrating a strong commitment to environmental governance and sustainable resource use. Overall, the findings indicate that Darau's eco-tourism model effectively integrates cultural preservation, livelihood improvement, and ecological responsibility, serving as a practical example of community-driven sustainable development in Sabah.

Several limitations should be acknowledged. The small sample size and brief field duration restrict the generalizability of findings beyond the local context. As the study was cross-sectional, it captured community perceptions at a single point in time, without accounting for long-term or seasonal variations. Moreover, the voices of certain subgroups—particularly youth and women—were less represented. Future research should adopt longitudinal or comparative approaches to explore how community attitudes, participation, and benefits evolve as tourism activity grows.

Although this study is case-specific, several policy insights emerge. Strengthening local capacity through training and cooperative support can enhance entrepreneurship and sustain community ownership of tourism ventures. Small-scale infrastructure improvements and participatory environmental monitoring can further ensure ecological balance without compromising autonomy. Continued collaboration between DBKK, UMS, and the Darau community will be vital in maintaining this model as a living example of grassroots eco-tourism, where environmental stewardship and community well-being advance hand in hand.

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