

PAPER 2.10

Potential of Ento-Tourism in Segaliud Lokan Forest Reserve, Sabah

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Abstract. Entomological tourism, a specialized ecotourism sector, is becoming acknowledged for its ability to offer distinctive and educational experiences focused on insects. This type of tourism takes advantage of the allure and variety of insects, appealing to enthusiasts, researchers, and nature lovers. The increasing interest in sustainable and educational travel has created a chance to investigate and admire the complex ecosystems influenced by insects through entomological tourism. This abstract explores the fundamental elements of entomological tourism, such as its educational significance, conservation ramifications, and economic advantages. These activities are gaining popularity and help foster public appreciation of insects, but their forms and techniques differ. Studying the timing of insect sightings during recreational and tourism activities can offer valuable information on how to enhance insect conservation through ecotourism, a component typically neglected in biodiversity conservation plans. This multidisciplinary study is new and has limited scope in both entomology and tourism sciences. When conducted with appropriate and ethical standards, entomological tourism can enhance the link between humans and the world of insects, leading to increased environmental awareness and local community development. This paper delves into the different aspects of entomological tourism, emphasizing its importance as a possible driver for biodiversity conservation, scientific research, and the advancement of sustainable tourist practices, and the SWOT analysis were conducted for this field to see the relevance.

Keywords: entomological tourism, conservation, sustainable tourist, SWOT analysis

INTRODUCTION

Nature-based tourism includes various activities focused on natural resources and ecosystems, offering chances for recreation, education, and adventure (Khairy & Magdy, 2021). This type of tourism has been widely popular worldwide because of its economic advantages and its contribution to promoting sustainable environmental growth (Lee, 2013). Entomological tourism is a subset of nature-based tourism that involves seeing and studying insects in their natural environments. This new sector in nature-based tourism provides distinct chances for travellers to interact with insect biodiversity and ecosystems, leading to a more profound comprehension of the natural world.

Entotourism is a type of tourism that focuses on observing and appreciating insects in their natural environments, falling under the category of nature-based tourism. This sort of tourism allows individuals to interact with insect biodiversity, promoting a deeper understanding of the ecological significance of insects and their function in natural ecosystems. Entotourism offers educational experiences for tourists to learn about various insect species and behaviours, enhancing their knowledge of entomology and ecology.

The increasing interest in entomological tourism could help boost the growth of insect-related enterprises, including those focused on insect-based food and products. There is a growing trend in consuming insect-based foods, and studies are investigating how much consumers are ready to pay for these items. The rise of insect-based industries, such as edible insect farming, offers new prospects for sustainable food supply and economic growth. The diverse nature of entomological tourism is showcased by these advances, illustrating its potential to connect with many sectors such as agriculture, food production, and sustainable development.

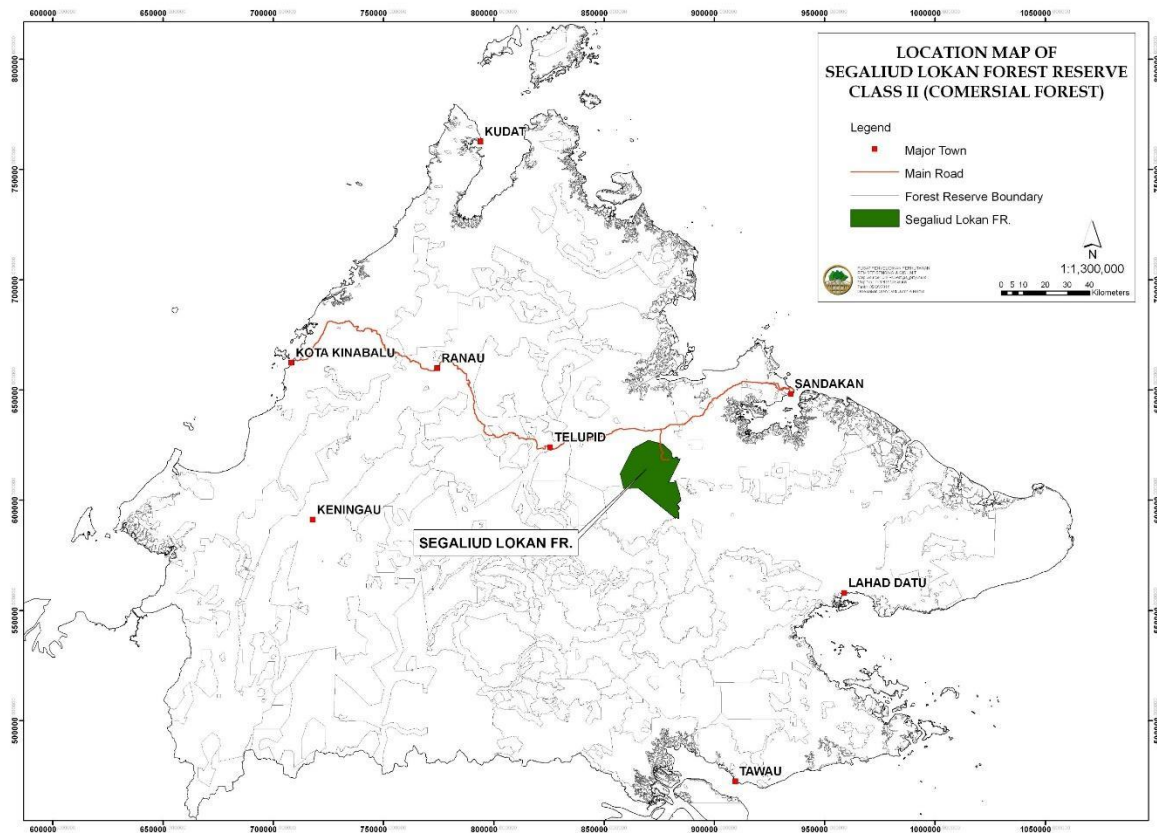
Furthermore, interactions between humans and insects through nature-based tourism and entotourism might enhance comprehension of insect behaviour, ecology, and conservation. Tourists can observe the complex relationships between insects and their surroundings by interacting with them in their natural habitats, which can enhance their bond with nature and support conservation initiatives. The hands-on involvement in entomological tourism supports the overall objectives of nature-based tourism, such as raising environmental consciousness, advocating for conservation, and encouraging sustainable behaviours.

Entomological tourism is a distinct and growing sector of nature-based tourism that is gaining popularity, as it allows people to interact with insect diversity, raises environmental consciousness, and supports the growth of insect-related businesses.

SWOT analysis is commonly utilised in business and management evaluation and may be effectively utilised in various other disciplines as well (Rizzo, 2005). SWOT analysis can assess and quantify aspects in a study, evaluate the project's strengths and weaknesses, and identify its opportunities and dangers. The survey assessed the potential of entotourism in the Sg. Rawog Conservation Area using observation and a SWOT analysis. This survey intends to evaluate the entotourism potential in the Segaliud Lokan Forest Reserve area. There was no data available on the entotourism potential within the forest reserve at the time of the current observation. This research is crucial for providing essential baseline data for conservation purposes through inventory, as well as information on entomological tourism.

METHODOLOGY

Study Site



The survey was conducted in Sg. Rawog Conservation Area of 3118 ha and 23.4 km in length, within the Segaliud Lokan Forest Reserve.

Research Techniques

The field survey was carried out by a few trials that were established in a few compartments which is some of it has salt lick. In conducting the observation of the potential of the entotourism, two types of data are required. Primary data was obtained through the survey from the site. The survey was carried out through sociological survey in accordance as a guideline since this observation does not have control over event. As for secondary data, it was obtained through the various journals and report on the insect-based tourism. In addition, any changes in the development and their role in maintaining the natural resources will be investigated through available report. Because of the time constraints in completing this study, there are fewer samples and observations. In order to obtain fresh information in the future, this study will serve as a guide for future researchers, ensuring that they have accurate information about the study's topic. It may not be much, but it should be useful.

SWOT Analysis

SWOT analysis was conducted in order to investigate the potential of entotourism potential in. This analysis tested the internal factors including strengths and weaknesses as well as external factors which are opportunities and threats in this region in terms of the diversity of an insect and the accessibility. Values of factors were identified by the

environment, local community and economic regarding to successful factors of ecotourism (Parker & Khare, 2005).

RESULTS AND DISCUSSION

Internal Factor Estimate Matrix (IFEM)

There were six factors to strengths in this study, the effectiveness score ranged between 2 and 4. Regarding weights, geographical features, biodiversity of forests, and the organization of ecotourism in the community had the highest weight. To weakness, the highest weight was no disposal plans and the lowest was lack of travel and ecotourism agencies. The final score was 0.96, which is lower than 2.5, SWOT analysis shows that if the value is less than 2.5, it means that there are fewer opportunities than threats. If the value is greater than 2.5, the opportunity is greater than the threat, which indicates that the value has less potential for the internal development of the tourism industry and can be explained in the external development (Ganjali, 2014; Ghorbani, 2015).

Ecotourism sustainable development strategies using SWOT and QSPM model: A case study of Kaji Namakzar Wetland, South Khorasan Province, Iran.

Table 1. Internal Factor Estimate Matrix

No.	Strength	Weight	Effectiveness score	Final Score
1.	Various of wild flora and fauna (large fern, butterflies etc.) including protected species (Pangolin & Rafflesia spp).	0.06	4	0.24
2.	Special landscape featuring, many different types of forests and rivers, with different scenery on each trail.	0.03	2	0.06
3.	There are few main trails determined by locals themselves. Local guides will explain the flora and fauna to tourists along the trail.	0.05	3	0.15
4.	High level of community awareness & compliance regarding biodiversity conservation.	0.05	4	0.2
5.	Endemicity of the insect is high	0.06	4	0.24
6.	Well organized community towards building ecotourism in their locality, willingness to learn and share experiences with community's vicinity kampungs.	0.06	4	0.24

No.	Weaknesses	Weight	Effectiveness score	Final Score
1.	Trails are not user friendly to beginners and poor strength people, as the routes are difficult for trekking.	0.05	4	0.20

2.	Unpredictable weather easily interrupts activity.	0.05	4	0.20
3.	Shortage of shelter for resting and rain along the trail.	0.04	4	0.16
4.	Lack of travel and ecotourism agencies.	0.02	2	0.04
5.	No disposal plans may cause waste pollution during tourism activities.	0.06	4	0.24
6.	Limited knowledge of insects in terms of entomological tourism.	0.04	3	0.12
Total		0.57		0.96

External Factor Estimate Matrix (EFEM)

Six factors were identified as opportunities and four factors as threats. Research and educational potential and increasing conservation awareness of the ecosystem to the local community had the highest weight. While the promotion of entomological tourism to public has the lowest weight. Threats to local ecosystem conservation and habitat disturbance risk of local resources destruction and land use issues regards of tourism development had the highest weight in terms of threats. The value of the external factor was 2.89 interprets that opportunities were more than threats. Hence, Sg. Rawog Conservation Area seems to have significant potential for entomological tourism development, however, there are still many facilities and conservation management need to improve.

Table 2. External Factor Estimate Matrix

No.	Opportunities	Weight	Effectiveness Score	Final Score
1.	More potential attraction can be explored in various landscape.	0.07	3	0.21
2.	Research and educational potential according to sustainable ecotourism.	0.10	4	0.40
3.	Increase conservation awareness of ecosystem.	0.10	4	0.40
4.	Job opportunity and economic development for local community.	0.09	4	0.36
5.	Promotion of entotourism to public.	0.05	2	0.10
6.	Enhance culture and traditional context conservation.	0.07	2	0.14

No.	Threats	Weight	Effectiveness Score	Final Score
1.	Threat to local ecosystem conservation and habitat disturbance.	0.10	4	0.40
2.	Risk of local resources destruction and land use issues regarding tourism development.	0.10	4	0.40
3.	Lack of environmental impact assessment for ecotourism facilities.	0.08	3	0.24
4.	Shortage of pollution treatment for waste disposal, i.e. food, vehicle.	0.08	3	0.24

Total	0.84	2.89
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Internal and external factors in the matrix of SO, ST, WO and WT strategies has been done for Sg. Rawog Conservation Area. Table 3 below shows sustainable tourism development strategies in Sg. Rawog Conservation area.

Table 3. Strategies of internal and external factors

SO strategies	
1.	Considering the area climate and weather which affects the potential activities when planning for an entomological tourism tour.
2.	More conservation research and education should be conducted in this area increasing local community knowledge and awareness.
3.	Considering particular ecosystem environment of Sg. Rawog Conservation Area, special geographical feature and biodiversity should be developed for this.
4.	Considering developed ecotourism management in the future in order to enhance more tourism industry for local community.
5.	Education of teaching and training tourism skills provide more opportunity for local community.
ST strategies	
1.	Government making management plan and strategy to avoid tourism's negative impacts on local ecosystem and biodiversity.
2.	Improving infrastructure to have better service and facilities to attract tourists.
3.	Increasing conservation activities to improve conservational capacity and awareness.
4.	Conducting Environmental Impact Assessments to prevent over landscape exploitation and habitat disturbance.
5.	Developing more traditional activities for keeping local culture and marketing.
WO strategies	
1.	Designing proper trails for safety and poor strength tourists.
2.	Establishing shelter and maintaining facilities along the trails for resting and visiting.
3.	Environmental education and culture building through public media, academic conferences, and NGOs.
4.	Corporating with tour agencies to promote the ecotourism package tour for local community.
5.	Communicating and introducing the ecosystem attractions by using well-designed educating packages.
6.	Considering the plan to deal with waste disposal for mass tourism.
WT strategies	
1.	Planning alternative tourism packages in case of unexpected weather
2.	Getting funds from stakeholders for continuing to maintain facilities
3.	More conservation knowledge education taught by professional experts to local guides
4.	Government making regulations and laws preventing negative impacts of tourism
5.	Environmental impact management formulated for increasing number of tourists in the future
6.	Waste treatment system planned for accommodation and other activities.

CONCLUSION

The study concludes that the Sg. Rawog Conservation Area has substantial potential for the advancement of entomological tourism. To enhance the region's appeal to tourists, benefit local communities, and aid conservation, it should adopt the suggested measures and tackle its vulnerabilities and dangers related to natural resources and biodiversity. Further research and cooperation among stakeholders are crucial for fully realising the potential of entomological tourism in the Segaliud Lokan Forest Reserve.

ACKNOWLEDGEMENT

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Slide Presentation

POTENTIAL OF ENTO-TOURISM

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Institute for Tropical Biology and Conservation, UMS

Tropocoptera *Isodiana brookiana*

1

Introduction

- What is Ento-tourism?
- Ento-tourism, also known as insect tourism, is a unique form of tourism that focuses on observing and appreciating insect behavior in their natural habitats. It offers a novel and educational experience for nature enthusiasts and those interested in insect ecology

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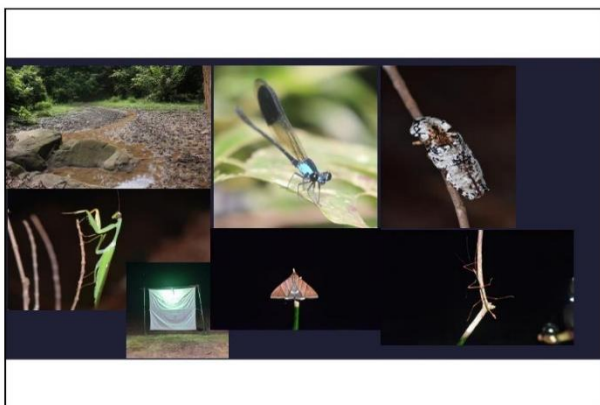
Methodology

Observing	SWOT analysis
<p>S</p> <p>w e e p n e t i n s e c</p>	<p>Internal Factor Estimate Matrix (IFEM) External Factor Estimate Matrix (EFEM)</p>

3

- SO Strategies**
Considering the area climate and weather which affects the potential activities when planning for an entomological tourism tour.
- ST Strategies**
Government making management plan and strategy to avoid tourism's negative impacts on local ecosystem and biodiversity.
- WO Strategies**
Environmental education and culture building through social media, academic conference, and NGOs.
- WT Strategies**
Planning alternative tourism packages in case of unexpected weather.

4



5

6 Bornean Endemic

- 2 moth,
- a huge dragonfly,
- 3 stick insect

General insect

- 17 butterfly
- 30 moth
- 3 beetle
- 10 dragonfly & damselfly.
- 15 others insect

6

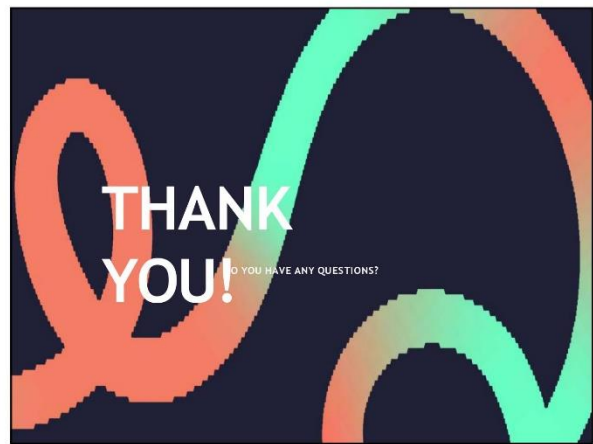
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Conclusion

The study concludes that the Sg. Rawog Conservation Area has substantial potential for the advancement of entomological tourism. To enhance the region's appeal to tourists, benefit local communities, and aid conservation, it should adopt the suggested measures and tackle its vulnerabilities and dangers related to natural resources and biodiversity. Further research and cooperation among stakeholders are crucial for fully realising the potential of entomological tourism in the Segaliud Lokan Forest Reserve.

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THANK YOU!

DO YOU HAVE ANY QUESTIONS?

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QUESTION & ANSWER SESSION

Session 2: Wildlife Diversity & Tourism Potentials

Name: Rahimatsah Amat

(Agency: Sabah Environmental Trust)

Question: Birdwatching in FRs, what is SFD's stand on, a) Permits on hides, b) Feeding to attract birds?

Hubert Petol: This is my personal opinion. There are permits for bird hides within forest reserve. Visitors need to pay entry permit to enter forest reserve. Supplementary feeding was conducted before the establishment of the hides and birds are habituated on the feeding and start to come to that area. For me I used to oppose to this idea on feeding birds, but now since it promotes community tourism and the revenue from the area is for the community, in turned they (the community) will look after the forest. One of my concerns especially on feeding store-bought milli worm to the birds might cause unwanted disease, it is better for the people to rear their own milli worm.

Name: Jonathan J. Lucas

(Agency: Sabah Forestry Department)

Questions: Since orang utans tend to avoid human contact but considering the many sightings of nests, would you recommend any tourism activity to observe orang utans?

Dr Nor Aifa: There are chances for orang utans sighting as tourism activity in SRCA, especially during fruiting season.

Pravind Segaran: There is potential. But orang utans population in SRCA are under stress, in order not to put more stress to them, it is advised to manage in carefully and make sure the guideline is clear.

Name: Benny Banus Tuzan

(Agency: Tropical Rainforest Conservation and Research Center)

Suggestion: The continuous expedition of SRCA with 5 year revisit with involvement of local young researchers is very impressive. Anyhow there are plenty of gaps that we could fill in to evaluate and monitor with different time and weather variable to come up with comprehensive outcome.

Name: Vernon Vest Mangum

(Agency: Biotechnology Research Institute, UMS)

Question:

1. Which one of the baits attracts the non-volant small mammals?
2. Do different baits attracts different species?
3. What gene used to identify the species?
4. Why identify molecularly?

Bryan Beckham Peter: Most attractive bait was the local white fruit called Engkala, which are found around the study area. The type of bait does not influence the type of species caught. We use cytochrome B gene for the molecular identification. The molecular study was conducted to confirm the species, because the result might differ although it looks similar morphologically.

Name: Lilian Jose

(Agency: Biotechnology Research Institute, UMS)

Question: Are the teams involved in this expedition planning to further their research at the molecular level to study more on the species adaptation to certain condition (e.g. certain gene which responsible on that particular adaptation)?

Hubert Petol: No, we are not thinking of doing any molecular study.