

# Evaluation of Tourists Satisfaction Towards Firefly Industry in Sabah Using Importance-performance Analysis Model

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**Abstract**

This paper focuses on the human dimensions of the firefly watching experience in Sabah with the using of Importance-performance analysis (IPA). The objectives are to investigate the motivations of tourists participating in firefly tours and to assess tourist's satisfaction with the environmental and tour services offered in Sabah using IPA analysis. The methods included site-based distribution of questionnaire to firefly tour participants at several firefly-watching sites in Sabah. Next, the importance-performance analysis was performed using the importance and satisfaction mean scores. The IPA analysis identified 10 environmental and tour features of management concern. Overall, respondents were very satisfied with the tourism industry in Sabah stating that they would recommend the tour (88.6%) to others. Most participants were very satisfied with the interest in firefly (78.8%), proximity to fireflies (55.92%) and the number of fireflies seen (54.29%). As conclusion, this study provides a greater understanding of tourist's motivation and satisfaction towards the firefly-watching industry in Sabah with the assist of Importance-performance analysis model.

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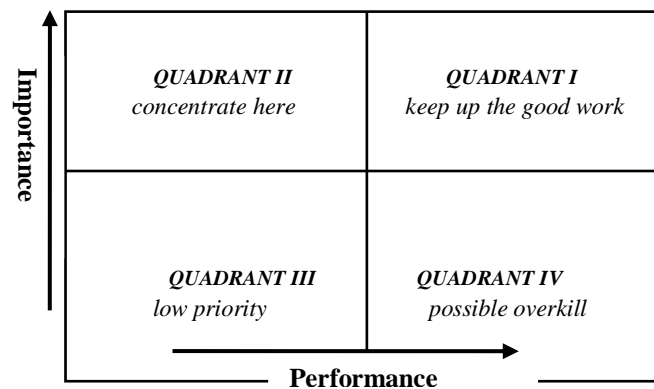
**Introduction**

Tourists travel from far and near to view the fireflies up close due to their ability to flash synchronously, making fireflies one of the potential products of ecotourism in Sabah. Sungai Klias in south-western Sabah, for example, fast gaining popularity for firefly-watching and might even eclipse the proboscis monkey as the main tourist draw in the area (Chey, 2004). Firefly is one of a significant component of biodiversity in terms of their diversity and role in ecosystem functioning. Conservation measures for fireflies are largely inadequate. Conservation efforts can be improved in the context of ecotourism. The benefits include increased awareness of firefly which will result in support for their conservation and improved products and services offered by ecotourism operators. So far in Malaysia, there is a serious lack of detailed and reliable information on the management of firefly tourism. Most studies on firefly have focused on the distribution and abundance of fireflies (see Nallakumar, 2002; Nada *et al.*, 2008; Wan Jusoh *et. al.*, 2010; Foo & Mahadimenakbar, 2015). This situation needs quick rectification as the fireflies and their mangrove habitats are fast becoming endangered by anthropogenic activities (Ohba & Wong, 2004; Wong, 2008; Wan Jusoh *et al.*, 2010).

As such the aim of our study is to add baseline information of the firefly ecotourism. This paper focuses on the human dimensions of the firefly watching experience in Sabah. In particular, it seeks to understand the motivations and satisfaction of the firefly tour participants in order to assess the industry's success in meeting customer expectations of environmental and setting features. Another important goal was to compare the mean tourist's assessments regarding the importance and performance of the important attributes or features using IPA analysis.

### Importance-performance Analysis (IPA)

The IPA proposed by Martilla and James (1977) is one approach that using simple graphical quadrants to compare the mean score for 'importance-performance' of various attribute or feature using a two-dimensional grid. This grid classifies mean scores into four categories to aid in data interpretation and assessing management important priorities: *keep up the good work*, *concentrate here*, *low priority* and *possible overkill*, allowing tourism manager to identify the areas of highest concern. Specifically, as shown in Figure 1, attributes located in Quadrant I have both high performance and high importance and are viewed as the opportunities to achieve or maintain competitiveness for organizations. Quadrant II has high importance but low performance, which indicates that the resources committed to these attributes are the major weaknesses for the tourism. Quadrant III has the characteristics of both low performance and low importance, and these attributes do not require additional efforts. Finally, attributes in Quadrant IV with low importance but high performance are considered as excessive and should be deployed elsewhere (Wu *et al.*, 2010)



**Figure 1.** IPA Matrix (Martilla & James, 1977).

### Research methodology

#### *Data collection*

The methods included site-based distribution of questionnaire to firefly tour tourist's in several firefly-watching location in Sabah such as Klias and Weston river. A total of 245 surveys were collected over the three-month period, resulting in a 5.2 % margin of error (90% confidence interval) (Salant & Dillman, 1994). These questions were developed through a literature review and refined following a pilot study in September 2015 (Ziegler *et al.*, 2012). Questionnaires used are closed-ended

questions regarding the importance of, and satisfaction with, a list of motivations for participating in the firefly tour in Sabah (ten items), environmental and setting features (eight items) and service quality (six items). Questionnaires were distributed to firefly tour participants in Sabah over a twelve-week period from October 2015 to January 2016. Tourists were selected opportunistically as they descended from the boats upon return from the firefly tours. Questionnaires were also left at hotel and/or lodges and travel agencies that offered firefly tours so that available tourists can answer it anytime. Overall, 90% response rates with 245 respondents were sampled. The 90% response rate is already enough to provide an adequate representation of the firefly tour participants in Sabah (Salant & Dillman, 1994).

## Result and discussion

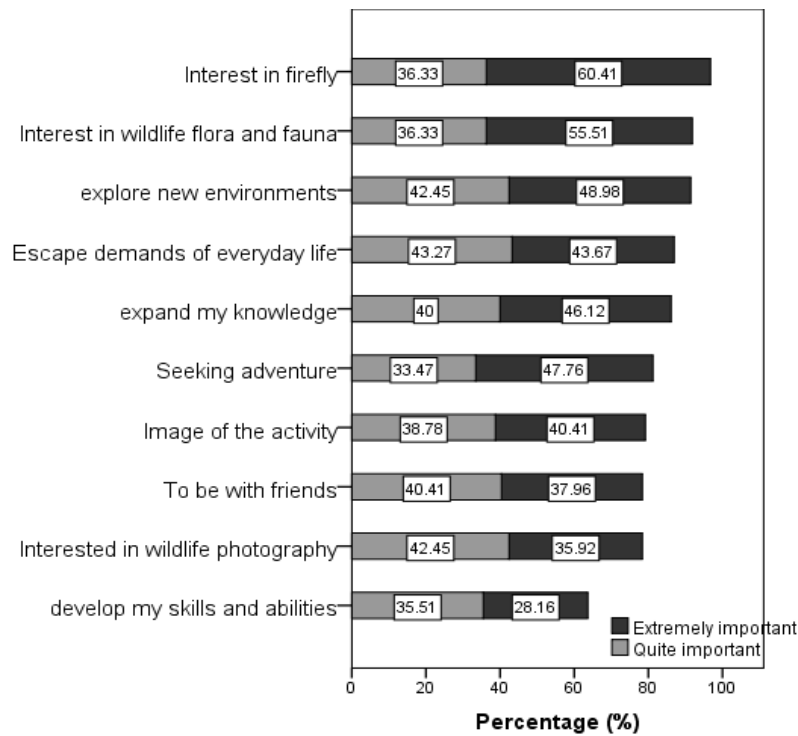
### *Sample characteristics*

Most of the respondents made the decision to participate in firefly watching tour when they arrived in Sabah (52.7%) while others decided before they left home with 47.3%. Package tours were sold by local tour operators and agents collaborated with local communities; with lodges and boats for river cruising. The total respondents collected are 245 tourists. According to the survey results, 60% of tourists were females and 40% males. Considering the country of residence, majority of tourists are from China with 44.9% and 13.9% from Korea. 60.4% of respondents were between ages of 26-35, 17.6% were within the age bracket of 36-45, 10.6% were under 25 years and 4.1% were 54-65 years. The highest levels of respondent's education are 79.2% of college/university and lowest is 6% from grade/primary school.

### *Motivations for participating in the firefly tour on Sabah.*

Firefly tourism in Sabah is an important motivator for travel to the site. Seventy-five percent of respondents stated the important of seeing firefly in their decision to Sabah. Respondents were also asked to rate the importance of a given set of motivations for participating in the firefly tour on a five-point Likert scale with a score of 1 corresponding to *not at all important* and a score of 5 *very important*. Figure 2 shows the rank importance of various tour motivations based on the percentage of respondents who scored a feature as important (score of 4 or 5).

The top three important features that motivated tourists for participating in the firefly tour are their interest in firefly (60.41%) and their interest in other wildlife that includes flora (55.51%). Firefly-watching tour is a package tour that includes evening river cruising for proboscis monkey experience and other flora and fauna watching too. Therefore, high interest in other wildlife than firefly was expected. The third important motivation is interest in exploring new environments (48.98%). Firefly tourism is one of the major night activities that are 'wildlife-friendly', allowing tourists to experience natural phenomenon in the wild during the night (Mahadimenakbar *et al.*, 2009).



**Figure 2.** Importance of social/psychological motivations for participating in firefly tour in Sabah.

#### *Environmental and setting motivations*

To understand the motivations and satisfaction of the firefly, it is important to assess the industry's success in meeting customer expectations of environmental and setting features, therefore, respondents were asked to a score specific environmental and setting features, as well as tour services using Likert scales. Figure 3 illustrates the range of responses of *quite important* and *extremely important* to the specific features. All motivations were at least moderately important, with a minimum of 60% response rate. In the questionnaire, respondents were also asked to name their top two most important environmental features from the provided list. The result for most important environmental features were, in descending order; proximity to fireflies, number of fireflies seen, good visibility, and variety of wildlife life. This order corresponds to the order of the four most important environmental features based on mean scores (although good visibility switched by quality transportation as top three important), confirming the validity of these results.

Respondents were also asked to rate their satisfaction with the environmental, setting features and tour services on a five-point Likert scale with a score of 1 corresponding to *very unsatisfied* and a score of 5 *very satisfied*. Figure 4 shows the results of this analysis in terms of the percentage of respondents who rated the given motivation as *somewhat satisfied* and *very satisfied*. The respondents were very satisfied with the number of fireflies seen, followed by good visibility they experienced and their proximity with the fireflies during the tour.

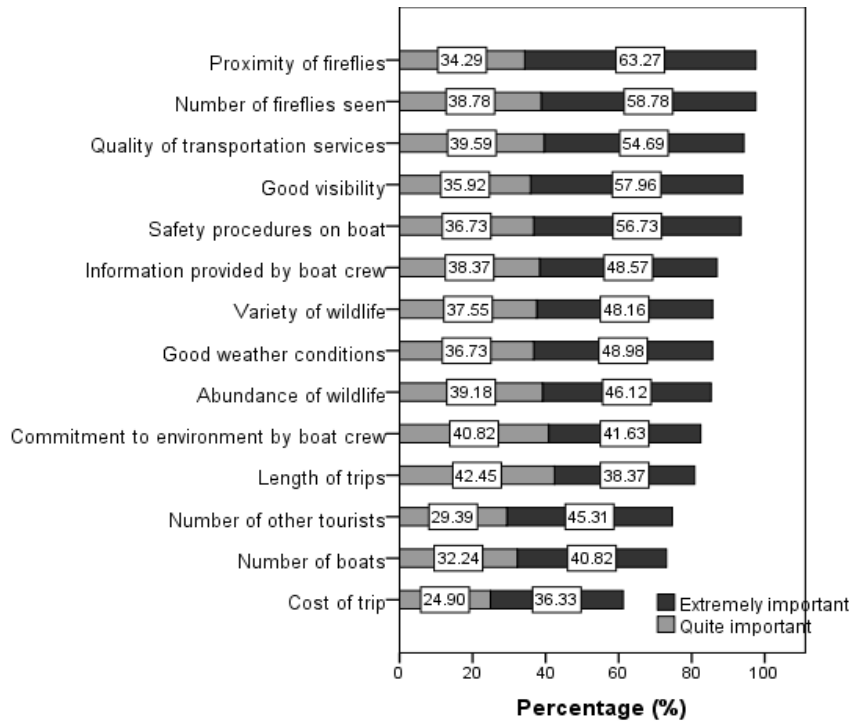


Figure 3. Importance of destination/services for participating in firefly tourism on Sabah.

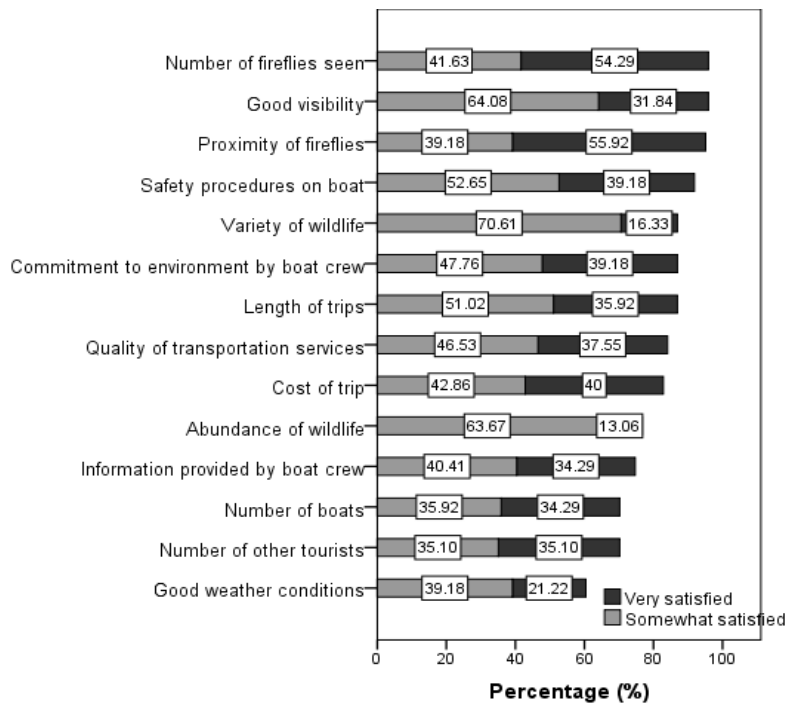


Figure 4. Satisfaction scores for environmental and tour features.

Overall, respondents were very satisfied with fireflies tourism industry in Sabah with nearly all of the respondents stating that they would recommend the tour (88.6%) to friends and family. Looking at the satisfaction for environmental features and tour services, the majority of respondents indicated they were satisfied with conditions encountered in Sabah (79.6%) while the rest are neutral with the overall experience (20.4%).

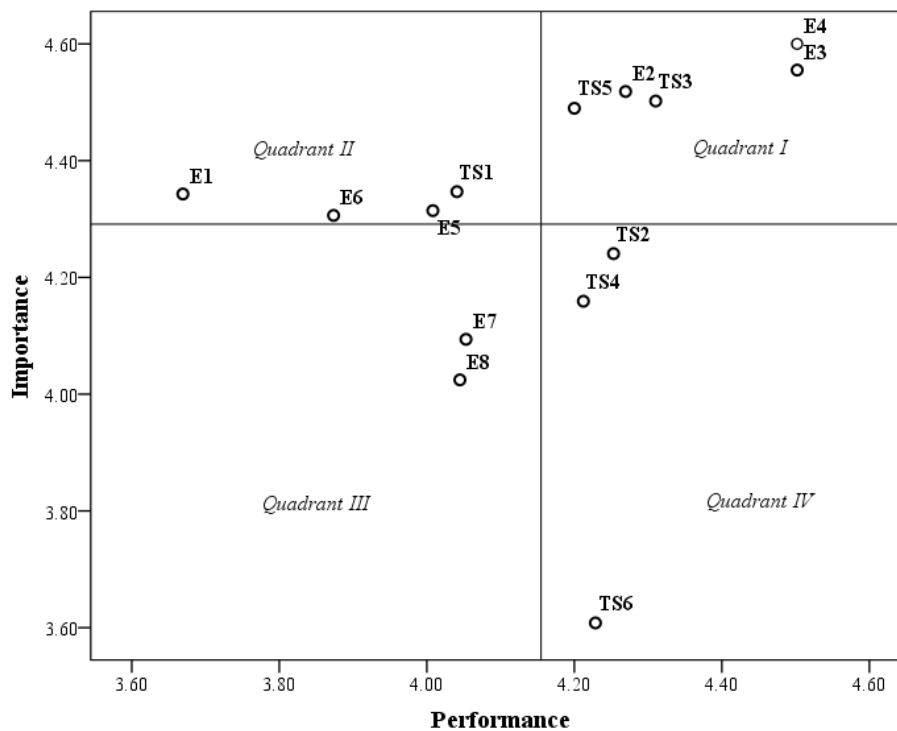
*Importance-performance Analysis (IPA)*

Looking at satisfaction and importance values separately is ineffective in assessing a particular tourism site's success in meeting participant needs and achieving sustainability. Therefore, the research goal to compare the mean tourist's assessments regarding the importance and performance of the important attributes or features using IPA analysis were done.

**Table 1.** Importance-performance analysis of environmental and tour features.

	Mean Importance	sd	Mean Satisfaction	sd
<b>Area of concern (Importance&gt;satisfaction)</b>				
<i>Environmental and setting features</i>				
E1 Good weather conditions	4.342	.727	3.669	.971
E2 Good visibility	4.518	.611	4.269	.558
E3 Number of fireflies seen	4.555	.581	4.502	.577
E4 Proximity of fireflies	4.600	.568	4.502	.618
E5 Variety of wildlife	4.314	.775	4.008	.607
E6 Abundance of wildlife	4.306	.735	3.873	.649
E7 Number of other tourists	4.093	1.049	4.053	.805
E8 Number of boats	4.024	1.051	4.044	.800
<i>Tour Services</i>				
TS1 Information provided by boat crew	4.346	.722	4.040	.862
TS3 Quality of transportation services	4.489	.604	4.200	.738
TS5 Safety procedures on boat	4.502	.618	4.310	.615
<b>Performance satisfactory (satisfaction&gt;importance)</b>				
<i>Tour Services</i>				
TS2 Commitment to environment by boat crew	4.240	.732	4.253	.696
TS4 Length of trips	4.159	.806	4.212	.704
TS6 Cost of trip	3.608	1.400	4.228	.722

\* significantly different at  $\alpha=0.05$ , based on a paired samples t-test  
sd = standard deviation

**Figure 5.** Importance-performance analysis of environmental and tour service features.

As shown in Table 1, the IPA analysis identified ten environmental and tour service features of management concern. Based on Figure 5, the IPA matrix reveals that good visibility, number of fireflies seen, proximity to fireflies, safety procedures on boat, and quality of transportation services in the Quadrant 1 which represents high importance and high performance. These are the services features which could be viewed as the strength of the firefly watching tour in Sabah and where tourism operator marketing activities should focus on. An important observation is that quality of transportation services and good visibility had high importance and even though they fall in Quadrant 1, they are relatively lower in performance as compared to the number of fireflies seen, proximity to fireflies, and safety procedures on boat. Since these two attributes have been rated high on importance, tour operators could focus attention on improving them. Number of fireflies seen has been rated as important and furthermore, its significance suggests that this attraction can be further highlighted in the firefly watching promotion activities. Similarly, the proximity to fireflies as highest on importance as well as performance, these attributes could be used effectively in destination attraction. To maintain the satisfaction, protecting the firefly and its surrounding environment should be highlighted, thus, no harm or threat affecting the species. Conservation awareness is important.

Environmental and tour services features falling in Quadrant 2 representing high importance and low performance, are good weather conditions, variety of wildlife life, abundance of wildlife life and information provided by crew. These are the features where tour operators and marketing efforts need more attention to turning them into areas of perceived strength. However, the only feature that can be influenced is the information provided by crew. Attractive ways of tour guide explaining the info during the river cruise can attract tourists to learn more about firefly and sparks the fun during the tour. Fun and attractive tour will increase the promotion of the firefly watching among tourists. Additionally, a satisfied customer will increase in their loyalty and repeat purchase (Heskett *et al.*, 1997). Quadrant 3 which depicts low importance and low satisfaction are numbers of other tourists and number of boats. These environmental features having low importance rating and a low performance rating suggest that investing resources in these areas may offer only little advantage. Though these elements seem to be unimportant at present, particular segments of tourists with specific needs of attention could be targeted with specific tour packages. But overall, these destination attributes appear less significant for enhancing the destination appeal for domestic tourists compared to other attractions in Quadrant 1 and Quadrant 2 as of now. The fall of these two features in this quadrant proved that the crowded issue within the firefly watching areas was not severed. However, this may not be true at all as the satisfaction of tourist is influenced by several factors. Further research regarding the crowded rate within the areas is needed.

Lastly, Quadrant 4 which represents low importance, high satisfaction is commitment to the environment by boat crew, length of trips and cost of trip. These tour service features attraction elements are perceived to be good but are not an important services element. These features rated low in importance and high in performance are areas providers should continue to maintain the same level

of effort. Customer high satisfaction would lead to a high increase in sales (Drake *et al.*, 1998). High-profit can help in improving the surrounding areas of the firefly watching site as well as improve the economy of the local community.

### Conclusions

Importance-Performance Analysis (IPA) is a useful model that can help managers to identify which features should be improved to increase overall customer satisfaction. Through the model, we concluded that the features: good visibility, number of fireflies seen, proximity to fireflies, safety procedures on boat, and quality of transportation services, are considered most important by firefly-watching tourists. As a conclusion, this study provides a greater understanding of tourists' motivation and satisfaction towards the firefly-watching industry in Sabah with the assist of Importance-performance analysis model.

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### References

- [1] Chey, V. K. (2004). Fireflies of Sungai Klias and their display trees. *Sepilok Bulletin*, **1**, 67-69.
- [2] Drake, C., Gwynne, A. & Waite, N. (1998). Barclays life customer satisfaction and loyalty tracking survey: a demonstration of customer loyalty research in practice. *International Journal Bank Marketing*, **16**, 287 - 292.
- [3] Foo, K. & Mahadimenakbar, M. D. (2015). Diversity of fireflies (Coleoptera: Lampyridae) of Sungai Teratak, Sabah, Malaysia. *Journal of Tropical Biology and Conservation*, **12**, 1-11.
- [4] Heskett, J. L., Sasser, W.E. & Schlesinger Jr., L. A. (1997). The service profit chain. *The Free Press*, New York.
- [5] Mahadimenakbar, M. D., Saikim, F. H. & Godoong, E. (2009). Studies on the potential of Fireflies watching tourism for firefly (Coleoptera; Lampyridae; Pteroptyx Spp.) Conservation. *Proceedings of JSPS-VCC Core University Program International Seminar on Wetlands & Sustainability- Wetland & Climate change: The Needs for Intergration*. 26-29 June, 2009. Kota Kinabalu, Sabah, Malaysia.
- [6] Martilla, J. & James, J. (1977). Importance-performance analysis. *Journal of Marketing*, **41**(1), 77-79.
- [7] Nada, B. & Kirton, L. G. (2007). *The Secret Life of Fireflies*. <http://www.luas.gov.my/irbm/updates>.
- [8] Nallakumar, K. (2004). *Management and Conservation of Fireflies in Peninsular Malaysia*. PhD Dissertation, University of London.
- [9] Ohba, N. & Wong, C. H. (2004). External Morphology and Ecological Study of the Firefly, *Pteroptyx tener* at Kampung Kuantan, Selangor, Malaysia. *Science Report of Yokosuka City Museum 2004*, **51**, 1-33.
- [10] Salant, P. & Dillman, D. A. (1994). *How to conduct your own survey*. New York: John Wiley.
- [11] Wan Jusoh, W. F. A., Hashim, N. R. & Ibrahim, Z. Z. (2010). Distribution and abundance of *Pteroptyx* fireflies in Rembau-Linggi Estuary, Peninsular Malaysia. *Environment Asia*, **3**, 56-60.
- [12] Wong, C. H. (2008). Firefly watching and conservation involving local communities in Malaysia. *International Firefly Symposium*. 26-30 August 2008, Chiang Mai, Thailand.
- [13] Wu, H. H., Tang, Y. T. & Shyu, J. W. (2010). An integrated approach of Kano's model and Importance-Performance Analysis in identifying key success factors. *African Journal of Business Management*, **4**(15), 3238-3250.
- [14] Ziegler, J., Dearden, P. & Rollins, R. (2012). But are tourists satisfied? Importance performance analysis of the whale shark tourism industry on Isla Holbox, Mexico. *Tourism Management*, **33**(3), 692-701.