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Abstract

Kuala Kubu Bharu (KKB), located in the northeastern part of Selangor, is a popular ecotourism site among visitors from Klang Valley and the neighbouring states. Visitors participate in several outdoor recreational activities in the surrounding Permanent Forest Estate (PFE) in KKB. The increasing number of tourists visiting KKB has raised the attention of local authorities to justify sustaining the natural recreational resources in KKB. However, the value of the benefits of recreational use of the forest has not been determined. Using the Travel Cost Method (TCM), data from visitors to KKB were collected to estimate the value of the natural recreational resources in KKB using consumer surplus. Based on the total number of visitors to KKB in 2019, the estimated consumer surplus is RM1,179,094.18. On the other hand, the estimated consumer surplus per tourist for each visit to KKB is RM6.38. The estimated consumer surplus per tourist per visit can be applied as the price for conserving the PFE in KKB.

Keywords: Travel Cost Method, Ecotourism Activities, Consumer Surplus, Permanent Forest Estate, Entrance Fees

Introduction

The Permanent Forest Estate (PFE) surrounding Kuala Kubu Bharu (KKB), Selangor, has become one of the popular ecotourism sites for the population in Klang Valley and the neighbouring states. KKB is located in the state's northeast corner, in the Hulu Selangor District. The total number of tourists who arrived at Hulu Selangor from January 2018 to September 2018 was 35,595, comprising 32,633 domestic tourists and 2,962 international tourists (Tourism Selangor, 2019). KKB is a historical town well known as Asia's first garden city. The town provides visitors with several budget accommodation facilities, recreational and daily provisions shops, restaurants and eateries serving local dishes, souvenir shops, and security and health services.

The increasing number of tourists to ecotourism sites has created several advantages for the local communities (Syamsul et al., 2012). Rural communities benefit from developing

facilities and other infrastructures like highways, accommodation, recreational, and health and security services. In addition, the expenditure of visitors creates income and employment multipliers to the economy of the local communities. Therefore, the participation of the local communities becomes an integral part of the ecotourism development in KKB (Johari et al., 2015). Several indigenous Orang Asli communities (Temuan, Semai and Jakun) are located in the district; the involvement of the Orang Asli communities in the ecotourism development has complemented the ecotourism products in KKB and PFE through the production of cultural and traditional products; besides, the participation of the Orang Asli communities helps to improve their livelihood (Siow et al., 2014).

Developed as a public good, the ecotourism site of KKB does not impose any entrance charges; therefore, it has led to the challenges faced by the management in the form of insufficient funding for maintenance and management of the site (Nair et al., 2012). The main source of funding for the maintenance of the site comes from the allocation by the Selangor State government. Therefore, there is a need to justify the budget allocation by determining the benefits in monetary values obtainable from the development of the ecotourism site. Several techniques can be employed as payment vehicles to measure the economic value of the ecotourism site to justify the funding for the maintenance of the ecotourism sites (Nair et al., 2013). The main objective of this study is as below

> *The Travel Cost Model is used to determine the economic values of the ecotourism resources at the PFE surrounding KKB using the concept of consumer surplus.*

Method

Study Site

The PFE surrounding KKB (Figure 1) has become an important ecotourism site in the Klang Valley since it provides nature-based ecotourism activities for citizens in Klang Valley. Visitors to KKB can participate in adventure activities such as jungle trekking, mountain hiking, off-track cycling, paragliding, white water rafting, and activities for families with young children such as photographing, fishing, camping, tubing, swimming, bathing in the shallow rivers and picnicking. The proximity of KKB to the population centre in the Klang Valley and neighbouring states has created KKB a substitutional opportunity for other ecotourism sites in the valley. Furthermore, the north-south highway and other state highways that connect KKB to the Klang Valley and the surrounding areas enable visitors to reach KKB in less than an hour's drive.

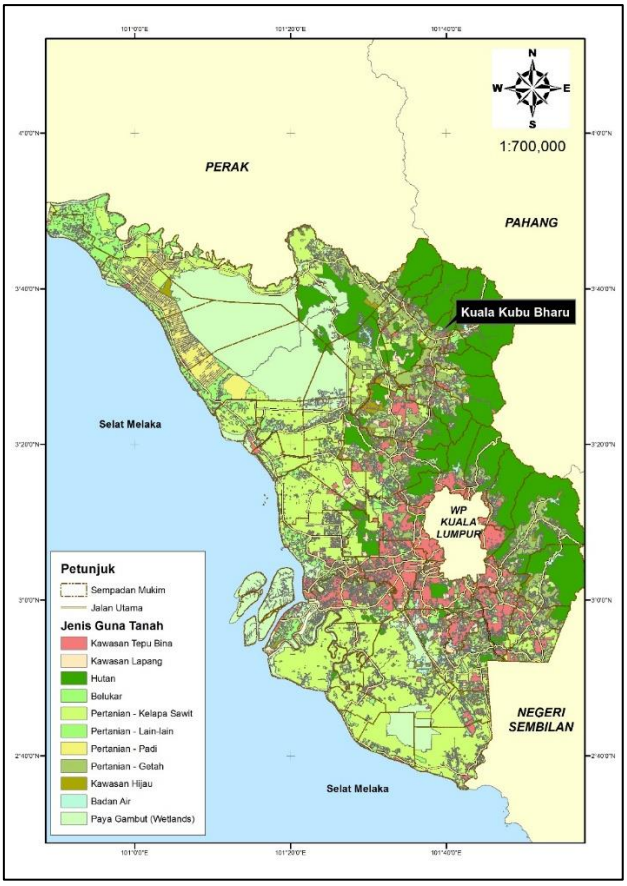

Figure 1. Location of the study site

Data Collection

A total of 500 sampled visitors were successfully interviewed to collect the data in the period of June to November 2020. Data were collected at the site using structured questionnaire during the face-to-face surveys. A non-probability purposive sampling technique was used to select the respondents. Only one member of the visiting group, the head of the family or leader, was chosen to respond to the survey to avoid duplication (Nur Syuhada et al., 2013). Data collection was mostly done on the weekends since most visitors come to the ecotourism sites; a small proportion of the visitors were interviewed during the weekdays. All interviewees were Malaysians, as during the data collection period, the Malaysian border was not open to foreign tourists due to the Covid 19 pandemic.

Travel Cost Model

One of the techniques that can be used to estimate the value of benefits or satisfaction of ecotourists at an ecotourism site is the indirect method of the Travel Cost Model, other techniques include the direct preference techniques (Razak et al., 2015). The model relates the distance travelled to the ecotourism site with the frequency of site visits. The relationship between distance travel and frequency of visit is hypothesized to be inverse, that is, the closer the ecotourist is to the site, the more frequent the visit; this physical relationship can be transformed into an economic relationship. When multiplied by the cost of travel per km, the distance travelled will indicate the Total Travel Cost. Thus when the Travel Cost is associated with the frequency of visits per period, this association creates the Demand for Ecotourism Activity (Ahmad, 1990)

With the formation of the demand curve for the ecotourism activity at the ecotourism site, the benefits of developing the ecotourism site could be estimated. Each point on the demand curve derived from the association of the frequency of visit (quantity) and cost for each travel (price per unit) reflects the maximum value that the ecotourist is willing to pay to obtain satisfaction from the activities carried out at the ecotourism site (Syamsul et al., 2013). The area under the demand curve measures the consumer surplus that indicates the benefits of protecting the resources through the gazettement of the area as a permanent forest.

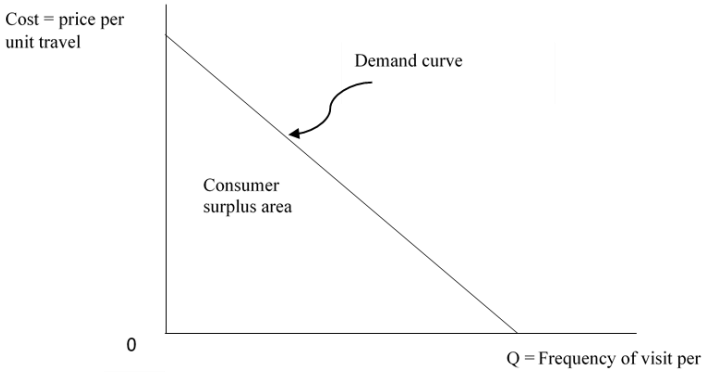

Figure 2. Demand curve for visit to an ecotourism site

The demand for ecotourism activity is estimated using the following function:

$$Frequency\ of\ visit\ per\ year\ =\ f(Cost\ of\ travel)$$
$$V\ =\ f(Cost) \qquad (1)$$

The travel cost from the origin (home) to the ecotourism site is the main factor that the ecotourist considers to decide whether to visit the site in question and the frequency of visits. The Total cost for each trip to the site includes several components such as fuel, toll, food and drinks during the travel, and accommodation rental (if the ecotourist breaks the trip and spends the night during the trip). The time taken from the origin to the site is included as a part of the Total Travel cost (Hagerty and Moeltner, 2005). The demand for ecotourism activities is influenced by travel costs and other factors known as the determinants of demand. These include the income of the ecotourist, services provided at the site, other ecotourism sites that the ecotourist could visit, and socio-demographic characteristics such as age, gender, accompaniment, education, etc. The determinants will shift the demand curve to the right or left depending on the determinant type, thus affecting the frequency of visits at a particular price level.

A general demand function to estimate the benefit to the ecotourist for the visit to the ecotourism site can be shown as follows:

$$V_i = \beta_0 + \beta_1 C_i + \beta_2 X_{1i} + \cdots + \beta_{n-1} X_{n-j} + e_i\ , i = 1,2,3,\cdots,N \qquad (2)$$

where:

V_i = frequency of visits by the ecotourist to the ecotourism site;
C_i = i^{th} travel cost and time cost per visit to the site,
$X_{1i},\cdots,X_{n-j}$ = other factors as determinants of demand for the i^{th} individual;
$\beta_0,\cdots,\beta_{n-1}$ = coefficients to be estimated; and
e_i = error term.

In general, travel expenses (the travel cost of the tourist in the ecotourist sites) are inversely proportional to the frequency of visits: the higher the travel expenses, the lower the frequency of visits (Ezebilo, 2016; Hanauer and Reid, 2017). This study's dependent variable is the number of times tourists visit KKB in a year. An Individual Travel Cost Method (ITCM) model will be applied in this study by following the double log model by (Menendez-Carbo et al., 2020).

$$\log V_i = \beta_0 + \beta_1 \log C_i + \beta_2 \log Gender_i + \beta_3 \log Age_i + \beta_4 \log Education_i + \beta_5 \log Income_i + \varepsilon_i \quad (3)$$

where

V = frequency of visits to KKB in a year;
β_0 = constant;
C = cost of travel and time;
$Gender$ = ecotourist gender; measured as a dummy variable
Age = ecotourist age;
$Education$ = ecotourist highest education level;
$Income$ = ecotourist gross monthly income; and
ε = error term.

Consumer surplus is a measure of consumer welfare, defined as the social value of a product in excess of the price actually paid (Menendez-Carbo et al., 2020). It is measured by the triangle area above the price observed below the demand curve. According to Menendez-Carbo et al. (2020), the personal benefits of CS are as follows:

$$CS = -\frac{1}{\beta_1} \quad (4)$$

where

CS = consumer surplus; and
β_1 = the coefficient of the cost of travel and time.

Results and Discussion

Regression Result

The double-log regression results are shown in Table 1. The education level and the gender of the ecotourist have no significant impact on the frequency of visits to KKB. The income of the ecotourist has no significant impact on the frequency of visits to KKB. As the tourist income increases or decreases, the tourist will not substitute KKB as an ecotourism activities site for other ecotourism activities sites. It means that tourists are satisfied with their experiences at the KKB ecotourism site.

On the other hand, as the travel cost and time cost of the ecotourist to the site increases, it will reduce the number of visits to KKB by 1% significant level. It is in line with the demand theory. Finally, as the age of the tourists increases, they are more willing to revisit KKB in the coming future.

TABLE 1
Estimated TCM model

Variables	Coefficient
C	-0.1586***
	(0.0273)
$Income$	-0.0520
	(0.0439)
$Gender$	0.1385
	(0.1743)
Age	0.2174**
	(0.0903)
$Education$	-0.0304
	(0.0765)
β_0	0.5703***
	(0.2015)
Adjusted R^2	0.0737
F-statistic	8.94***
Log Likelihood	6.5672
Durbin-Watson	1.8032

Note: The corresponding standard error is given in (…). *, ** and *** indicate significance at the 10% level, 5% level and 1% level, respectively.

Economic Value Estimation

Based on the estimation in Eq.5 below, the estimated consumer surplus for the KKB ecotourism site per visit is RM6.38. As discussed in the methodology section, consumer surplus measures consumer welfare, defined as the social value of a product in excess of the price actually paid. Therefore, it also reflects the recreational services values of the PFE in KKB. The total consumer surplus for the KKB ecotourism site is RM1,179,094.18 (based on a total number of tourists of 184,811 in 2019) in a year.

$$CS = -\frac{1}{\beta_1} = -\frac{1}{(-0.1586)} = \text{RM}6.38 \qquad (5)$$

Based on the estimated consumer surplus per trip per tourist to KKB above, a proposed starting price of RM5.00 per tourist per visit can be imposed on the KKB ecotourism sites. Based on the estimated consumer surplus per tourist per visit being RM6.38, it also means that tourists are willing to pay RM6.38 more on top of what they are paying now. A RM5.00 per tourist per visit is below the estimated consumer surplus; therefore, it was reasonable to impose a starting price. At the same time, the tourists are willing to pay RM5.00 for the recreational services they enjoyed in the PFE of KKB.

The proposed RM5.00 can be used as a baseline for the price for ecotourism activities in KKB. The collection of the RM5.00 per tourist per visit will help the Selangor Government generate about RM924,055.00 annually (based on a total number of tourists 184,811 in 2019). The collated funds can be applied to the conservation of the KKB and the maintenance of the KKB ecotourism sites. It will help improve tourist satisfaction during their experiences in the ecotourism sites surrounding KKB.

At the same time, KKB's PFE protection has also attracted the attention of the Selangor State Government. On 11 November 2021, Menteri Besar of Selangor State Datuk Seri Amirudin Shari announced that KKB is located in Hulu Selangor, now the Central Forest Spine (CFS) area in Selangor (BERNAMA, 2021). Menteri Besar of Selangor State also stated that the PFE is a continuation of the central mountain ranges near Perak and Pahang, suitable for a site similar to CFS Selangor (BERNAMA, 2021). Finally, the CFS region is an essential catalyst for protecting national ecological corridors.

Conclusion

In conclusion, RM5.00 can be charged as the entrance fee for the ecotourism sites surrounding KKB. The local authorities can use the collected fee to maintain and conserve the ecotourism sites. The entrance fee collected was also in line with the vision of the Selangor State Government, where PFE in KKB was the CFS of Selangor. Identifying the economic values of the ecotourism services in this study will help up the development and conservation process of the CFS Selangor. At the same, the conservation of the PFE in KKB through ecotourism activities will help raise the publics' awareness about the importance of CFS. The consumer surplus estimated the consumer surplus, the economic values of the ecotourism activities will be able to be priced. The fees that have been collected will help for the conservation of the ecotourism sites around the KKB.

Finally, it can help in the conservation of the CFS Selangor.

Travel cost method offers a theoretical framework that can unlock the social and environmental values associated with ecotourism destinations. TCM's theoretical contribution to ecotourism goes beyond valuation. It offers vital information for developing policies and managing sustainable tourism. Policymakers may make educated judgements about tourist capacity, infrastructure development, and income allocation by assessing the social and environmental values of ecotourism locations. By exposing the potential trade-offs between economic growth, environmental preservation, and community well-being, this strategy also emphasises the need for long-term sustainability.

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