

Visitor Willingness to Pay using Travel Cost Method at Taman Negeri Gunung Stong, Kuala Krai, Kelantan

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Abstract. Forest Park Recreation is a place that offers a vast experience and scenic views to visitors. However, there isn't a proper market transaction for ecosystem services, so it might not be reflected in market transactions. Therefore, it's critical to consider travel and time expenses when determining what individuals value in the absence of a market price. This study aims to estimate the visitor's willingness to pay for forest park recreation using the Travel Cost Method (TCM) at Taman Negeri Gunung Stong, Kuala Krai, Kelantan. A convenience sampling technique is employed in this study. The data was collected from 379 respondents using face-to-face interviews with the visitors who entered the park. The TCM result revealed that the recreational value at TNGS is RM 1,286,531.80 per year, with a mean of the willingness to pay value is RM4.34 per visitor. The regression analysis results indicated that gender, age, income, total travel cost and time access to the site are the variable effects on the willingness to pay and visit people to the forest park. The findings of this study could be an effective instrument for raising the standard of environmental services and enhancing the infrastructure and services in the studied area.

1 Introduction

Forests are known as the primary habitat that supports various species, providing functions and economic value benefits to humans and serving as places of recreation and spirituality in multiple cultures, religions, and societies. Assessing the recreational value of tourism locations is crucial since natural resources offer services with non-market benefits. [12]. The building of Peninsular Malaysia's recreational forest landscape may be broken down into three distinct stages. The first stage lasted from 1966 to 1979, allowing people to engage in

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simple recreational pursuits, including camping, swimming, picnics, and wildlife observation. The public's demand for appropriate outdoor places for activities like walking in the forest, appreciating the environment, research and educational reasons, and other active pursuits like mountain climbing led to the second phase (1980–1989). Third phase: from 1990 to the present, when the region underwent ecotourism development and launched the inaugural Visit Malaysia Year campaign. [7]. In Malaysia, Kelantan is renowned as a state with several natural environmental landmarks and a rich cultural history that supports the sector's development and boosts local income. Numerous beautiful locations, including Taman Negeri Gunung Stong, Dabong, Kuala Krai, Kelantan, Gua Musang Caves, Taman Negara Kuala Koh, Gua Musang, Lata Keding, Jeli, and Gunung Reng, were ideal for designating as recreational locations. People love to visit recreational parks since being in nature and exposed to natural light can boost one's mood and lessen stress and depression. As the population grows, so does the need for outdoor recreation [9]. People living in the city are exposed to noise pollution, population increase, air pollution, and other environmental pollutants, which tend to leave the cities and cause a rise in demand for ecological nature [10]. Recently, in the aftermath of a pandemic, economic difficulties have brought financial challenges to many government-sponsored programs, including parks and recreation. The availability of enough financial resources for operating and capital needs is a frequently voiced worry among park and recreation administrators [5]. Moreover, low financial resources lead to a lack of accessibility to recreational resources. Due to the recreational resources being necessary for rural infrastructure, there is an urgent need to take drastic measures toward them. After all, a recreation area offers both locals and visitors a place where they can unwind, engage in social activities, create enjoyment, and maximize the potential of forest parks by drawing in people [2][8]. The present research aims to explore the visitors' perceptions towards the recreational resources and estimate the visitor's willingness to pay (WTP) for the recreational forest park using the travel cost method (TCM) at Taman Negeri Gunung Stong, Kelantan.

2 Methodology

2.1 Study Area

Taman Negeri Gunung Stong is a natural forest area covering 21,950 hectares with several prominent mountain peaks that have become one of the most famous ecotourism spots near the small town of Dabong in Kelantan. Situated at the Dabong Forest Reserve, its flora and fauna are still untouched by development. Taman Negeri Gunung Stong's outdoor recreation activities are better-known and much more extensive than any other recreational park in Kelantan. At least seven major climbing peaks and cascading waterfalls, including the accessible waterfall of Jelawang caves, rare animals, birds, and plants.

2.2 Data collection

The researchers collected the data from October to November 2022 through a convenience sampling technique. A total of 379 respondents were surveyed entirely by using a structured questionnaire. To avoid bias, the questionnaire was accomplished only by representatives of the groups or families with the researcher's assistance. The questionnaire was designed in Bahasa Malaysia. The respondents collected demographic information, travel characteristics, visitors' perception of recreational resources and willingness to pay during the survey.

2.3 Data analysis

2.3.1 Travel Cost Method

The travel cost method (TCM) calculates a particular visitor's willingness to pay (WTP). The approach used in this study is the individual travel cost method (ITCM). The ITCM technique is more appropriate than the zone method since it allows for including socioeconomic characteristics as explanatory variables [3] [16]. The information gathered from the surveys was about how often they went to the facility and how much it cost them to get there. The demand function for the site was derived using this cost. With the aid of the individual trip cost demand function, the idea of recreational value may be simply stated. The usage value of the leisure place is determined by multiplying the consumer surplus (access value) by the travel expenses incurred in getting there.

$$V_{ik} = f(P_{ik}, T_{ik}, Q_i, S_k, Y_i) \quad (1)$$

Where V_{ik} is the number of visits made by the individual, next P_{ik} is the travel cost trip for the person to the leading site. Next T_{ik} is time incurred by individual i when visiting site k . Q_i is the vector perceived qualities of the individual. Meanwhile, S_k is a vector of characteristics believed to influence the number of visits they take per season, and Y_i is the household income for a person. With this theoretical theory, the demand for visits to the TNGS can be derived, and the consumer surplus can be derived from the demand. Consumer surplus is a way to compare willingness to pay and what is willing to be paid [15]. Consumer surplus is used to evaluate the recreational value, and CS data can be obtained through the equation:

$$\text{Consumer surplus} = V/P_{ik} \quad (2)$$

Equation 2 estimates the average consumer surplus. The total consumer surplus is the actual data for this study, which is the recreational value for TNGS. For a simple regression model, the equation is:

$$V_{ik} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 \quad (3)$$

where V_{ik} is the number of visits by a respondent, and the others are the same as equation 1. All the theoretical theories in data analysis will be used to calculate the result using Statistical Package for Social Science software (SPSS) version 18.

3 Results and Discussion

3.1 Respondents background

The results in Table 1 revealed that the surveyed respondents' average age was from 21 to 30 years old, mostly male (55.7%). Marital status was included in the question of the demographic profile to identify the different answers between married people and single respondents. Married people need to spend a lot of money compared to single people. Married respondents accounted for 62.3% of the total sample size, equivalent to 236 people. In contrast, single respondents are only 143 people, representing 37.7% of the total number of respondents. More than half of the total respondents (58%) acquired an education level: a degree, a Scholar, or a Ph.D. Meanwhile, the respondents who participated in this study came

from different backgrounds. The number of respondents who served as civil servants is the highest, with 33.5%, followed by the private sector at 28.2%. Only one respondent (0.3%), pensioner and unemployed, was involved in this study. Household monthly income stated in the questionnaire refers to the sum of income of all family members. Most respondents have a household income ranging from RM3510 to RM4500, with 106 respondents or 28% of the total respondents.

Table 1. Respondent's Socio-demographic Profile

Variables	Frequency	Per cent (%)
Gender		
Male	211	55.7
Age		
Below 20	22	5.8
21 – 30	153	40.2
31 – 40	111	29.3
41 – 50	76	20.2
51 or above	17	4.6
Marital Status		
Marriage	236	62.3
Educational Level		
Secondary school	13	3.4
Certificate/STAM/STPM	67	17.7
Diploma	79	20.8
Degree/Scholar/PhD	220	58
Occupation		
Government	127	33.5
Private Sector	107	28.2
Self employed	53	14.0
Student	90	23.7
Not working	1	0.3
Pension	1	0.3
Household monthly income		
Less than RM1,500	1	0.3
RM1,510 – RM2,500	31	8.2
RM2,510 – RM3,500	93	24.5
RM3,510 – RM4,500	106	28
RM4,510 – RM5,500	99	26.1
More than RM5,510	49	12.9

3.2 Travel characteristics

The results in Table 2 showed that most of the respondents are from Kelantan state (33.0%), with the majority travelling with the groups (48.5%) and followed by 178 respondents from family travel. Regarding to the transportation, 237 respondents (62.5%) used their car to reach TNGS. Most respondents take 1-5 hours (70.8%) to travel from their actual place to TNGS since most of the respondents are from Kelantan. In addition, each respondent's travel

distance will differ based on their state. The majority of the respondents' travel distance is 201-300km (27.8%). Basically, the respondents who live outside Kelantan have a high travel distance. The more distance it takes, the more travel cost they spend. In determining the willingness to pay and consumer surplus, on-site-time hours and on-site-time days are essential. Half of the respondents spent at TNGS less than 12 hours (70.8%). On site-time day questions, respondents were given a question stating that if they were to stay overnight, how long would they stay at TNGS? From the survey, 243 respondents stated that they would stay for one night due to the attraction and calmness of the environment provided at TNGS. Moreover, TNGS became famous among hikers (35.4%) as it presented the highest waterfall in Southeast Asia. Last but not least, the purpose of travelling to that place can give other tourists an idea of the speciality of that place. This is presented by 97.6% of the respondents, who cited the natural beauty offered by TNGS as their top draw.

Table 2. Travel characteristics of respondents to Taman Negeri Gunung Stong

Variables	Frequency	Percent (%)
State		
Johor	21	5.5
Kedah	21	5.5
Kelantan	125	33.0
Kuala Lumpur	41	10.8
Melaka	7	1.8
Negeri Sembilan	33	8.7
Pahang	16	4.2
Perak	19	5.0
Perlis	4	1.1
Selangor	42	11.1
Terengganu	38	10.0
Type of visited		
Solo trip	17	4.5
Groups	184	48.5
Family	178	47.0
Transportation		
Own car	237	62.5
Rent car	13	3.4
Motorcycle	50	13.2
Bus	23	6.1
Others: Train	56	14.8
Travel time		
Less than 30 minutes	30	7.9
1 – 5 hours	268	70.8
6 – 10 hours	60	15.8
More than 11 hours	21	5.5
Travel distance		
Below 100km	74	19.6
101km – 200km	55	14.8
201km – 300km	109	27.8

301km – 400km	64	17
More than 401km	77	20.5
On site-time (hours)		
<12 hours	268	70.8
25 – 48 hours	79	20.8
>72 hours	32	8.4
On site-time (days)		
One night	243	64.1
Two nights	108	28.5
Three nights	28	7.4
Aims to TNGS		
Hiking	134	35.4
Camping	21	5.5
Picnic	65	17.2
Bathing	53	14.0
Others	106	28.0
Purposes of visit to TNGS		
Close to the location	8	2.1
Natural beauty	370	97.6
Recreational facilities provided	1	0.3

3.3 Willingness to Pay (WTP)

In this section, the survey presented that 376 respondents (99.5%) declared they were willing to pay for the slight increment of entrance fee at the park. From the price bid, 283 respondents (74.9%) responded that they were willing to pay RM4.00, followed by RM5, represented by 73 respondents (19.3%). However, a few respondents who stated their response were not willing to pay for the increment entrance fee at TNGS. They specify why they do not believe the payment will be used for nature conservation, and one considers that it is not his responsibility to pay that entrance fee, as presented in Table 4. A similar study from [7] & [9] showed that respondents are reluctant to pay since they did not understand the value of protecting the natural environment for living and non-living organism's survival.

Table 4. Frequency of the Respondent's Willingness to Pay

Characteristics	Frequency	Per cent (%)
Willingness to pay		
Yes	376	99.5
No	3	0.8
Price bidding		
a. RM3.00	11	2.9
b. RM4.00	283	74.9
c. RM5.00	73	19.3
d. RM6.00	3	0.8
e. RM7.00	8	2.1

Reason not willing to pay

a. Do not believe the payment will be used for nature conservation	2	0.5
b. It is not my responsibility to pay	1	0.3

3.4 Regression Analysis

Table 5 presented the result of multiple linear regression analysis which determined the factor that influences the value of the willingness to pay. Multiple linear regression is a statistical test used to measure the relationship between dependent and independent variables. The statistical data considered is the correlation (coefficient & significance) and regression to predict the relationship between dependent and independent variables [4]. From the result, The R^2 coefficient explains to what extent the included variables can explain the variation in the number of visits made. The R^2 value of the regression analysis was estimated to be 32.1%. Compared to similar studies, this value can be seen as low but still acceptable. The high correlation is above 70%, whereas a measure below 40% would show a low correlation, implying that the relationship between the number of trips made to the TNGS and the included variables is low. The analysis showed that five variables are statistically significant, which are gender, age, income, total travel cost and time access to the site by p-value at 0.01, 0.05 and 0.10, respectively. The income variable p-value is 0.0419, with a significant value at 95% of a confidence interval presented that the higher the household income, the more visits will be. Despite that, the growth of the country's economy also affects the family's income. This can be shown by the rapid growth of the Malaysian economy in 2016, 2017 and 2018 [6]. In 2019 the country's economy declined due to the COVID-19 epidemic, but the number of visitors increased because most stayed within the Dabong district. The travel cost variable showed a negative coefficient value of -0.273. According to the theoretical framework, this seems correct, that the number of visits decreases as the travel cost increases. This matter can also be considered when visitors make a multi-destination trip, where visitors make trips to many recreational places, and travel costs will increase. Besides, the age variable has a high significant value at 1% (0.0010) for this study. This would indicate that visitors aged 30 years and above will visit frequently. Meanwhile, the result of gender implied a p-value of 0.0625 that was significant at a 95% confidence interval, explaining that male respondents tend to have more visits than female respondents. Most of the activities preferred at TNGS are hiking compared to other activities. Men do most strenuous activities, and the findings show women do fewer outdoor activities [14]. The last variable is time access to the site, which delivers a coefficient value of 0.036 and a statistically significant 1% p-value. This indicates that the less time travel takes, the more visits are made. According to [1], time trips spent are one of the pull factors that increase the recreational area's visit. Visitors frequently go to places with lower prices. Even though it was discovered that trip costs did not significantly affect visits, the time costs associated with trips impacted visits [11].

Table 5. Multiple Linear Regression Model's Result

Variable	Coefficient	Significant p-value
Constant	2.034	0.0010***
Gender	0.052	0.0625*
Total Travel Cost	-0.273	0.0705*
Age	0.145	0.0010***
Income	0.150	0.0419**
Time accesses the site	0.036	0.0010***
R²		0.321

Note : * are significant at 90% of a confidence interval
 ** are significant at 95% of a confidence interval
 *** are significant at 99% of a confidence interval

3.5 Estimation of Consumer Surplus

Consumer surplus represents the recreational use value attached to a recreational site. It also refers to additional value beyond travel costs derived by the people when visiting a recreation site [13]. As described above in the theoretical theory of consumer surplus, the calculation of CS is below:

$$\text{Consumer surplus} = \text{Average visits} / \text{Travel cost} \quad (4)$$

Applying the results in this model gave: $351223.18 / (-0.273)$

Aggregated consumer surplus = RM 1,286,531.80

Table 6. Average Benefit per Year Estimation

Year	Total visitors per year	Mean WTP (RM)	Total Benefit
2016	4173	4.34	RM 18110.82
2017	2398	4.34	RM 10407.32
2018	2493	4.34	RM 10819.62
2019	23211	4.34	RM 100735.74
2020	18529	4.34	RM 80415.86
2021	30123	4.34	RM 130733.82
Total average benefit per year			RM 351,223.18

Consumer surplus is calculated by dividing the average number of visits per year. The aggregated consumer surplus for the TNGS was estimated to be RM 1,286,531.80 million. The value of consumer surplus seems high, possibly due to the low cost of travel because the number of visitors from Kelantan is more than outside visitors, which causes the amount of consumer surplus to be high. Nevertheless, the mean willingness to pay at TNGS is recorded as RM4.34 per person, and the total benefit estimated is RM351,223.18, as displayed in Table 6.

4 Conclusion

The finding indicated that the respondents' travel characteristics are significant to the visitor's choice to enter the forest recreational area. In this study, the age, gender, income, time access to the park and total travel cost are reflected in the value of the willingness to pay at TNGS. In addition, the visitors' willingness to pay for recreational resources has been revealed in this study. The mean value of willingness to pay is RM4.34, and the consumer surplus per year is RM1,286,531.80. The charge for entrance fees can be increased slightly in the affordable range to preserve and conserve recreational resources in Taman Negeri Gunung Stong, Kelantan. This study showed that if the quality of TNGS is improved, it will attract more visitors and, in turn, generate more significant revenue. This study's findings may help clarify how the benefits and costs of recreation are distributed in the study area. Ultimately, the results of this research will eventually assist ecosystem managers in developing a sustainable recreation strategy for land use planning.

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