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# Local visitors' willingness to pay of entrance fee at Taman Negeri Gunung Stong, Kelantan

N H Hassin<sup>1\*</sup>, D A N Abang Jais<sup>1</sup>, M A Abas<sup>1</sup>, Z Hamzah<sup>1</sup>, A N Muhammad Noor<sup>1</sup>, H Hussin<sup>1</sup>, M Abdullah<sup>2</sup>, N Koshy<sup>3</sup>, S Alhaji Dauda<sup>4</sup>

<sup>1</sup>Faculty of Earth Science, Universiti Malaysia Kelantan Jeli Campus, 17600, Jeli, Kelantan, Malaysia

<sup>2</sup> Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor, Malaysia

<sup>3</sup> Faculty of Environmental Studies, Universiti Putra Malaysia, 43400 Serdang Selangor, Malaysia.

<sup>4</sup>Federal University Gashua, Gashua, Yobe State, Nigeria

\*Corresponding author: hizami.h@umk.edu.my

**Abstract.** The forest ecosystem offers plenty of benefits and provisions for the environment and human wellbeing. One of the forest ecosystem's potential advantages is that it serves as a recreational forest area for tourists. However, most tourist destination faces minimal or raising public support for natural attraction maintenance and management. Hence, managing the recreational forest lacks financial resources to provide and restore adequate recreation facilities. This study aims to determine local visitors' willingness to pay an entrance fee in Taman Negeri Gunung Strong, Kelantan, Malaysia. A total of 150 respondents who had visited Taman Negeri Gunung Stong has participated in this study. The sampling techniques employed in this study is a probability stratified sampling approach. A contingent valuation method dichotomous choice was performed in this study to elicit the mean value of willingness to pay. The study found that the mean willingness to pay for an additional entrance fee to enter Taman Negeri Gunung Stong is estimated at RM 5.03 per visit. The variable of socioeconomic which is the only income influences the mean value on acceptance of suggested price. The study is proposed that the entrance fee collections can provide support as supplementary funds for the allocations made of management and maintenance costs in Taman Negeri Gunung Stong.

## 1. Introduction

Forest ecosystems primarily provide a variety of functions and economic values that benefit humanity. Recreational value is a subset of indirect forest and park ecosystem values, encompassing forest, hiking, leisure, recreation, and other activities [1, 2, 3]. Forests in Southeast Asia consist of a high value of biodiversity, habitats, and commercially introduced products [4]. The forests are adequately designated as recreational forests for public use. It was established as part of the program in the First Malaysia Plan (1966 – 1970). The Department of forestry is responsible for managing and designing the recreational forest. Meanwhile, the scenic beauty of recreational areas occupies about 0.05% total of permanent forest in Peninsular Malaysia reserves.

Kelantan is a solely popular place with a natural environment and cultural heritage contributing to tourism growth to increase local economy income. Many attraction places are appropriate for a recreational visit such as Taman Negara Kuala Koh, Gua Musang, Gunung Reng, Jeli, Kolam Air Panas [5], Lata Renyok, Jeli, Taman Negeri Gunung Stong, Dabong, Kuala Krai, Kelantan, and others. The presence of the iconic Rafflesia flower in Lojing highlands has also attracted international tourists



to visit Kelantan [6, 7]. People place a higher value on leisure time and recreation, boosting demand for public recreational resources. Green pace and national park are two examples of public recreational assistance. People may loosen various recreational possibilities and facilities such as picnics with family, sightseeing, and participating in adventure activities [8]. The tourism sector has drawn attention as it is a way to fill the leisure time to reduce the impact of rising stress caused by rapid urbanization. The economic activities development, population increase, high living standard, air pollution phenomenon in cities, noise pollution and other environmental pollutants have caused a rise in demand for environmental nature [1]. People living in urban areas tend to leave the cities and use the natural environment to escape mechanical and hideaway in natural recreational areas and resorts outside the cities.

Recently, most tourist destinations faced minimal or raising public support for natural attraction maintenance and management [9]. Moreover, there is a lack of financial resources for the management of the parks to restore adequate recreation facilities to ensure that the management of natural resources is a measure and uses people's contribution to the conservation and revival of these areas. Recreational forest helps biodiversity loss, maintains the beauty of the landscape, and acts as an ecological function that supplies ecosystems' services [10]. Limited funds have put pressure on forest managers of recreation forests to maximize the revenue by charging entrance fees based on recreation and conservation facilities and public utilities. The present research aims to determine the willingness to pay for entrance fees using the contingent valuation method for conservation purposes at Taman Negeri Gunung Stong, Kelantan, Malaysia.

### *1.1. Factor Influence Visitors' Willingness to Pay*

Several factors affect the determine visitor's willingness to pay. The majority of studies discovered that social and economic factors such as age, gender, occupation, income, education, and others influenced willingness to pay determination. According to Thalany Kamry [11] and Nor Hizami Hassin et al. [12], income and education are the most important elements influencing the amount of willingness to pay in their studies. Meanwhile, Mayuri Dutta [13] discovered that the tested independent variables of sex, educational attainment, distance, and income level of the surveyed tourists have a substantial impact on their willingness to pay for maintaining the natural resources of Assam's Nameri National Park.

## **2. Methodology**

### *2.1. Study Area*

Taman Negeri Gunung Strong (TNGS) is a natural forest reserve in Kelantan that covers 21,950 hectares and is located near the small town of Dabong. It is a pristine forest reserve located west of Kelantan that was gazetted as a state park and ecotourism site in 2007. The park encompasses 61128 hectares (ha), consisting of 28134 hectares (ha) of Southern Gunung Stong Reserved Forest and 11040 hectares (ha) of Northern Gunung Stong Forest Reserve. [14]. TNGS has two management authorities, the Kelantan State Forestry Department for the forest area and a private party at the entrance and recreational or waterfall site. Outdoor recreation activities at Taman Negeri Gunung Stong are more well-known and comprehensive than those in Taman Negara, but they are less well-marketed due to their remote location. At least seven major climbing peaks, cascading waterfalls, including the Jelawang caves' accessible waterfall, uncommon animals, birds, vegetation, and much more [15].

### *2.2. Research sampling*

In order to gather information and respond to visitors, a survey was conducted utilizing a structured questionnaire. The stratified random sampling technique is carried out to limit the possibility of human bias in case selection [12]. As a result, a total of 150 respondents have participated in the research. Only individuals with prior experience at TNGS are selected as respondents. However, because of the worldwide pandemic of Covid-19, the survey was conducted using a web application called google form to collect data from respondents. The google form is a cloud-based data management tool used to

design and develop the web-based questionnaire: the web-based and online survey tools commonly used in data collection instruments in a nowadays networking environment. The collection of data began in October until November 2020. The questionnaire is well organized in the google form to easy the respondents to answer.

### 2.3. Data analysis

The descriptive data is performed to gather the data of demographic collected and analyzed by using the software, namely Statistical Package for Social Science (SPSS), to find the mean and percentage of each data from the respondent. The data extracted is the respondents' preliminary information, including gender, age, race, marital status, formal education, occupation, and monthly household income.

#### 2.3.1. Estimation of Willingness to pay

The mean of respondents' willingness to pay to improve environmental services is elicited using the CVM with a dichotomous choice. When there is no market knowledge regarding a respondent's preferences, the approach is expressly relevant. In this case, the CVM is selected because of the importance of non-use values and the hypothetical significance level [16]. This approach is also commonly used to calculate both use and non-use values. The amount of money or value that an individual is willing to pay for products or services is described as the willingness to pay. It also assesses if people are prepared to forego their earnings in order to assure the availability and maintenance of environmental goods and services [17]. As a result, the binary logit regression technique was applied to compute the respondents' WTP in TNGS. It is used in determining the significant level of the CVM technique. In estimating the WTP of the respondents in TNGS, there are values for 'Yes' or 'No' based on the questions given. The value of 1 represents Yes, and the 0 value represent No. The respondents were asked if they would be prepared to pay certain additional costs for a specific commodity, with 'Yes' and 'No' as options. The amount of each respondent's bid varies. Each respondent is only asked if his or her maximum WTP is more than or lower than the bid. WTP was calculated using the logistic regression technique [18]. The possibility of expressing 'Yes' to a bid is evaluated using this method at various values of the independent variable as follows:

$$P = (1 - e^{-x})^{-1}. \quad [1]$$

At this point, P is the likelihood that the price will be accepted under this probability function, and x is the bid amount (price). This area depicts the fraction of the population that would consume the good at each price level and the utility associated with each price level. Integration techniques are used to calculate the area under the curve, which may be stated as:

$$E(WTP) = \int_L^U (1 + e^{a+bPRICE})^{-1} dPRICE, \quad [2]$$

where,  $(1 + e^{a+bPRICE})^{-1}$  is the probability of saying 'Yes' and Upper and Lower are the integration limits, respectively. In this paradigm, estimating the mean WTP is based on some assumptions regarding the integral upper and lower limits. For example, knowing the price amounts at which the probability of saying 'No' is 0 and saying 'Yes' is 1.

## 3. Result and Discussion

### 3.1. Socio-economic profile

The frequency and percentage of distributions for the socioeconomic profile of the 150 respondents are shown in Table 1. The majority of the respondents (68.0 %) were female, which contributed to the study's outcome. This has a similar finding in a previous study conducted in the recreational forest by Aswad et al. [19] and Kim et al. [20] indicated that female respondents are more active and mainly participate in survey question studies. Meanwhile, the respondents are mostly area single (90.0%). In

terms of race, many of the respondents are Malay (84.0%), followed by the other races come from Bumiputera Sabah/Sarawak (10.0%), Chinese (5.3%) and Indian (0.7%), respectively. The young people become as a majority of the respondents with 84.7% which between 21-29 years old while the rest of the age groups was 30-39 age group (6.7%), 40-49 age group (5.3%), below 20 years old (2.7%) and 50 and above years of age (0.7%). Based on age groups, the result shows that the youth respondents tend to participate more in this survey.

Hence, this study found that most respondents obtained a high level of formal education. It can be expressed as more than half of respondents had formal education. It was found that 80.7% of respondents attained university degrees. 9.3% of respondents had a university diploma, and the rest, with 6.0%, had a certificate of college/STPM. The employment of the respondent's status is an important variable related to the respondent level of income and their willingness to pay. Basically, a higher income is linked with their higher willingness to pay. The results figures that most of the respondents were full-time students (55.3%) while private employees (19.3%), government employees (11.3%), self-employed (8.7%) and unemployed (2.0%). In this study, respondents were asked to state their monthly gross household income level. The results found that most respondents (35.3%) earned a monthly gross household of R.M. 2001- RM 3500, which is categorized under the B40 income group. They were then followed by an income group of RM 1001 – R.M. 2000 (12.7%), RM 6501 – RM 10000 (10.7%) and the lowest number of respondents monthly income with RM 10,001 is 2.3%. Theoretically, the respondents who receive a higher income are willing to pay more for an entrance fee in Taman Negeri Gunung Stong to protect the recreational forests for present and future generations.

**Table 1.** Demographic profile of respondents

Variables	Frequency	Percent (%)
<b>Gender</b>		
Male	48	32.0
Female	102	68.0
<b>Age</b>		
Below 20	4	2.7
21-29	127	84.7
30-39	10	6.7
40-49	8	5.3
50 and above	1	0.7
<b>Race</b>		
Malay	126	84.0
Chinese	8	5.3
Indian	1	0.7
Others	15	10.0
<b>Marital Status</b>		
Single	135	90.0
Married	15	10.0
<b>Level of formal education</b>		
Secondary school	4	2.7
College/STPM	9	6.0
University – Diploma	14	9.3
University – Degree	121	80.7
University – Master/PhD	2	1.3

**Occupation**

Government employee	17	11.3
Private employee	29	19.3
Self-employee	13	8.7
Factory	2	1.3
Unemployed	3	2.0
Students	83	55.3

**Monthly Gross Household Income Level**

Below RM 1,000	24	16.0
RM 1,001 – RM 2,000	19	12.7
RM 2,001 – RM 3,500	53	35.3
RM 3,501 – RM 6500	33	22.0
RM 6,501 – RM 10,000	16	10.7
Above RM 10,001	5	3.3

*3.2. Willingness to pay analysis*

Table 2 displays the frequency of distribution of the respondent's willingness to pay an additional (bid) amount. The results show that 90 (60.0 %) of the 150 respondents said they would be willing to pay for the proposed bid, while 60 (40.0 %) said they were reluctant to pay. The results of this study contain a minimum bidding price, implying that a high number of respondents are willing to pay for an increase in entrance fees [21, 22]. Based on the collected results, most respondents were willing to pay for the offered bid starting at RM1 until RM5. For the first bid level value of RM1 provided to the respondents, the result recorded that 42.2% of the respondents were willing to pay, and the rest were unwilling to pay (11.7%). The second bid level value of RM2 assigned to respondents revealed that 40.0 % were willing to pay for that, though, while 15.0 % would refuse to pay. It implies that a shrinking amount of respondents were willing to spend an additional RM2 for an additional entrance fee. The table illustrates that for the third, fourth and fifth bid level values of RM3, RM4, RM5, the number of respondents willing to pay gradually reduced for the offered bid where the data recorded 11.1%, 2.22% and 4.44%, respectively.

**Table 2.** Percentage of Respond Bidding Price

Additional Price Bid (R.M.)	Yes	No	Total
	Frequency (%)	Frequency (%)	Frequency (%)
1	38 (42.2)	7 (11.7)	45 (30.0)
2	36 (40.0)	9 (15.0)	45 (30.0)
3	10 (11.1)	10 (18.3)	20 (13.3)
4	2 (2.22)	18 (30.0)	20 (13.3)
5	4 (4.44)	16 (26.7)	20 (13.3)
Total	90 (60.0)	60 (40.0)	150 (100.0)

*3.3. Binary Logit Regression*

The binary logistic regression technique was applied in this study to analyze the probability of the respondents' willingness to pay for the rate of increase of entrance fees in TNGS. The binary logit regression model's results were estimated using SPSS software in order to analyze whether there are

significantly different socio-demographic or independent variables that influence the willingness to pay. The majority of research has discovered that economic and socio-demographic factors influence willingness to pay [23, 24]. The result of the logit regression model has been summarized and tabulated in Table 3. The result revealed that price and income had shown a significant value at a 1% level concerning local visitors' willingness to pay for an additional entrance fee at TNGS. In this regression, the goodness of fit test is indicated by Nagelkerke  $R^2$  with a value of 0.221. The percentage of the right prediction is more than half, which is 78.0%. The coefficient for the price is negative as expected at the value of -0.552. The result is consistent with the study performed by Adamu et al. and Hassin et al., indicating a lower probability of willingness to pay by respondents as the increasing value of price bid-offer [25, 26]. According to the analysis, income is only the demographic variable that is significant with 0.000. It can be implied that the higher income groups are willing to pay more compared to the lower-income groups [23]. The rest of the variables are not reported in this analysis due to insignificant results recorded. Overall, the estimated mean of willingness to pay for an additional entrance fee for TNGS obtained from the model is RM 5.03 per visit.

**Table 3.** Result of Binary Logit Regression Model

Variable	Coefficient	Standard Error	Significant
Constant	0.879	1.179	0.000*
Price	-0.552	0.142	0.000*
Income	0.000	0.000	0.015**
Nagelkerke $R^2$	0.221		
Log-likelihood	156.219		
Percentage of right prediction	78.0%		

Note: \* significant at 1% level or 99% of confidence interval

\*\* significant at 5% level or 95% of confidence interval

#### 4. Conclusion

The purpose of the study is to determine how much respondents are willing to pay for a TNGS entrance fee. The value of willingness to pay was calculated using the contingent valuation technique (CVM). Overall, the result shows that most respondents are concerned about taking care of the recreational forest for future generations. The data interpreted showed the local visitors' willingness to pay for an additional entrance fee in TNGS. The respondents are willing to pay an additional RM 5.03 for an additional entrance fee in TNGS. The results proved that the local visitors showed their satisfaction and were willing to contribute their little financial to protect and conserve TNGS. The park's local authorities could be considered implementing a reviewable charge for the park's entrance fee and capable of turning into a fund to protect and conservation of the recreational resources in TNGS. In a nutshell, the finding in this study has shown that the respondent's willingness to pay for it is affected by socio-demographic factors, which are gender and race. Nevertheless, the respondents' satisfaction with facilities and services provided in TNGS is the essential factor that influences their willingness to pay.

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