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# VISITOR'S WILLINGNESS TO PAY FOR CONSERVATION AND IMPROVEMENTS OF HUTAN LIPUR ULU BENDUL, NEGERI SEMBILAN

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**Abstract:** Hutan Lipur Ulu Bendul is a recreational forest that serves as a place to escape from hustle and bustle of city life. However, the excessively large number of visitors has affected the forest, as the tourists lack conservation awareness. The main objectives of this study are (i) to analyse the visitors' Willingness to Pay (WTP) for conservation and environmental protection of Hutan Lipur Ulu Bendul and (ii) to observe the determinants of visitors' WTP such as education level, income, and age. This study involved about 150 randomly selected visitors at Hutan Lipur Ulu Bendul, Kuala Pilah. About five sets of questionnaires were distributed to 150 respondents during data collection. From the three variables tested, only household income had a significant effect on the WTP for conservation, estimated with a hypothetical method, double-bounded Contingent Valuation Method (CVM). The findings are crucial in understanding the value that visitors place on forest conservation and improvements by describing the level of environmental awareness among visitors.

**Keywords:** Recreational forest, Willingness to Pay (WTP), forest conservation, Contingent Valuation Method (CVM), environmental awareness.

## Introduction

Natural forests contribute to the economy and provide numerous social advantages, as well as being essential for human well-being and survival. According to the World Wide Fund for Nature (WWF), forests provide livelihoods, medicine, fuel, food, and shelter to approximately 1.6 billion people, including indigenous people. The more than 200 World Heritage Forest sites today now cover about 69 million hectares, roughly twice the size of Germany, and all of them have unique forest ecosystems (Carvalho Resende *et al*., 2021).

Malaysia's total land area is 33.0 million hectares, of which 55.3% is natural forests. In Negeri Sembilan, 23.8% of its area in natural forest (Azman, 2015). However, forests in Malaysia are increasingly threatened by many factors. Malaysia is a developing country and many forests have been turned into residential areas, development projects, agriculture, tourism, and many more. From 2001 to 2019, about 95% of tree cover loss in Malaysia occurred in areas where deforestation was for commodity purposes (GWF, 2022).

### *Background of the Study Area*

Hutan Lipur Ulu Bendul (HLUB), also known as Taman Eko-Rimba Ulu Bendul is a Lowland Dipterocarp Forest and Hill Dipterocarp Forest on the southern edge of the Titiwangsa Range in Peninsular Malaysia, and on the edge of Sungai Batang Terachi, about 20 minutes' drive from the town of Kuala Pilah, Negeri Sembilan (Negeri Sembilan Forestry Department, 2015). Then, ruler of Negeri Sembilan, Tuanku Muhammad, popularised the forest as a recreational location in 1920 after it was created in 1917. The history of Ulu Bendul is often associated with some myths. In ancient times, the Sungai Terachi was deep enough to allow boats to navigate. However, a large rock in the river caused a boat to break upon it and leave the bend. This incident occurred upstream of a village leading to the area being called Ulu Bendul (Negeri Sembilan Forestry Department, 2015). Another opinion is that the recreational forest is named Ulu Bendul because it is located upstream of the river or "*Ulu*" in the local dialect, and a nearby mountain is considered a barrier, or "*Bendul*".

An array of activities can be enjoyed in the recreational forest, such as camping, hiking, trekking, fishing, bathing, and swimming. For those who are interested in mountaineering can start explore the hills around HLUB. Since HLUB is in Hutan Simpan Gunung Angsi, the forest is popular among climbers for the breathtaking views from atop Mount Angsi (Figure 1). Mount Angsi's varied terrain that attract visitors includes rivers, rapids, and waterfalls. Apart from Mount Angsi, visitors can also enjoy Jeram Kak Lang (Figure 1). Climbers usually take a break at the rapids before continuing their journey to the summit of the mountain.


Figure 1: Hiking trail to Mount Angsi
Source: Azis & Abas, 2021

However, when the environmental goods and services, namely biodiversity, atmosphere, river, water, and air, are available for free use, market failures happen. This is because no one owns and holds the property rights to these environmental goods, and, therefore, cannot be bought or sold. The environmental goods and services hold public goods characteristics, that are nonrival in consumption and yields nonexcludable benefits. There are no costs for their use or misuse by law. As a result, an excessive number of visitors at HLUB causes congestion. So, one person's use will affect others outside the market. Based on the characteristics of public goods, nonrivalness is the indivisible benefits of consumption such that one person's consumption does not preclude that of another. Nonexcludability is the characteristic that makes it impossible to prevent others from sharing in the benefits of consumption. Externalities that harm the environment, water supply, natural resources, and overall quality of life are of interest to environmental economists.

Thus, in the case of the HLUB, there is a negative externality when the consumption of an individual reduces the well-being of others who are not compensated by the individual (Figure 2). For instance, trash left behind by a visitor will affect other individual's comfort. According to Utusan Malaysia (2021), an outbreak of COVID-19 and other illnesses at HLUB was triggered by some visitors leaving trash behind and not following Standard Operating Procedures (SOPs). As result, 13 people who visited Ulu Bendul waterfall suffered fever, diarrhoea, nausea, vomiting, body aches, and other symptoms (Shafawati, 2021). Two cases of COVID-19 infection, two cases of Leptospirosis (rat urine), and one case of rotavirus have been identified, with another eight cases awaiting test results (Kosmo, 2021). Since there will be no consequences on litterers, and they are not obliged to pay compensation for resource mismanagement, there is no incentive for individuals to keep an area clean. Therefore, this study was conducted to determine the visitors' willingness to pay for the conservation of HLUB area and indirectly conserve and protect the biodiversity in the area. This study will deliver valuable information for future research that will explore various environmental economic valuations for conservation purposes.

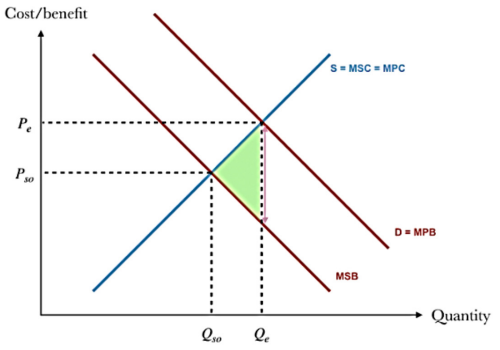


Figure 2: Negative externalities of consumption (market failure)
Source: Blitz Notes, 2022

***Willingness to Pay for Conservation***

In a review article, Mamat *et al*. (2013) examines the willingness of tourists to pay for the conservation of Pulau Redang Marine Park, Malaysia (PRMP). According to the dichotomous-choice CVM, there was willingness to protect the park. The study showed that the average WTP for 2008 was between RM10.86 and RM28.69, which is equal to a revenue collection of between RM1.65 million and RM4.36 million in total. It is suggested that PRMP charges be increased from the existing RM5.00 for adults and RM2.50 for children under the age of 12. Similarly, a study by Siew *et al*. (2015) found that visitor income levels and offer prices were important factors influencing visitor WTP for conservation at Paya Indah Wetlands using the Logit model to estimate entrance fees. Based on the findings, the average WTP amount earned is RM7.12 per visitor and the expected benefit of the conservation programme at Paya Indah Wetlands (PIW) is estimated at RM630,768 in 2012. Therefore, with the collection of entrance fees, the increased availability of funds means better environmental preservation.

A study by Hassin *et al*. (2020) found that the development of ecotourism had the potential to attract tourists in Gelam Forest, Kelantan. To estimate the economic value of Gelam Forest, the CVM method was used to find out the WTP of the local community that sourced ecotourism services from Gelam Forest. The results showed that the total bid (price), income, and education of respondents is a significant forecaster of the level of WTP for the conservation of ecotourism resources. The minimum WTP was estimated at RM4.20 per head a year. In contrast, research on Sarawak's Gunung Gading National Park (GGNP) using randomized surveys by Kamri (2013) found that the average WTP for improvements in environmental conservation is RM16.14 for international visitors per visit and RM7.38 for local visitors per visit. Gender, education, and income have a significant impact on the WTP for the protection of GGNP. Overall, most studies on conservation of environmental goods and services find that people are willing to contribute in order to protect and conserve the goods/services, since people realize the significant function of environmental goods and services to their life and its existence to future generation.

***Stated Preference Method (SP)***

There are two types of methods which are under the umbrella of Stated Preference Method (SP) based on hypothetical market, namely, (i) Contingent Valuation Method (CVM) and (ii) Choice Modelling (CM). CM is further divided into four types, i.e., (i) Choice Experiment (CE), (ii) Contingent Ranking, (iii) Contingent Rating, and (iv) Paired Comparisons.

***Contingent Valuation Method (CVM)***

In this study, to determine the economic value of ecosystem and environmental services,

the Contingent Valuation Method (CVM) is employed. The CVM is a questionnaire-based method for assessing environmental commodities. The gist behind the method is that people have hidden preferences for environmental goods (Hoevenagel, 1994). The irreplaceable merits inherited from CVM studies demonstrate that there is no need for a correlation between economic market price and non-market commodities. The researchers should create a hypothetical situation to explore the respondents' opinions and insights on services or goods (Tao *et al*., 2012).

According to Lee and Han (2002), CVM has been widely employed for determining the economic value of non-market goods such as recreational resources, wildlife, and the quality of environmental goods. They further claimed that this strategy has two benefits. First, it can assess an individual's WTP for potential changes in the quality of recreational activities as well as the current scenario. Second, while the travel-cost method (TCM) can be used to assess travel with a single purpose or a single destination, CVM can assess travel with multiple purposes or multiple destinations. A study by Venkatachalam (2004) argued that if the outcomes followed basic economic principles, the CV decisions may be considered 'theoretically valid'. To put it another way, the validity of the CV method's WTP value can be determined by reversing it against standard economic variables.

***Choice Experiment (CE)***

Choice experiments (CE) are a new method of valuing environmental resources (Christie *et al*., 2009). It is a relatively new addition to the SP analysis tool that is now being studied not only in environmental economics but also in health, transportation, and marketing (HM Treasury, 2003). CE is a type of stated preference valuation technique that can be used to calculate the economic benefits associated with different aspects of an environmental policy (Hensher *et al*., 2005). CE is appealing because it can value the component aspects of forest recreation (Christie *et al*., 2007).

According to Hanley *et al*. (1998), the method has recently evolved to define various aspects of environmental policy design rather than the characteristics of the environmental goods themselves. Although many design difficulties remain unresolved, choice experiments have significant advantages over other environmental valuation methods, such as contingent valuation and travel cost type models (Hanley, 1998). Because it is concerned with modelling choices that change over a range of indicators rather than the estimation of the WTP for a single option, CE has promise for measuring various economic values (Ku & Yoo, 2010). CE also involves applying statistical design theory to create option sets that can produce coefficient estimates that are unaffected by other variables (Yoo *et al*., 2008).

Therefore, after comparing CVM and CE's in SP methods, the CVM was found to be the best standard approach for determining WTP values for conservation as it is a well-known method for evaluating the types of landscape and wildlife benefits. The CVM presented a dichotomous choice format and incorporated a new part-whole bias correction. As an environmental valuation technique, choice experiments are rarely employed.

The CVM is the simplest and most straight forward, as respondents will be questioned directly about their maximum WTP. The CVM has the advantage of not only capturing use value, but also eliciting existence and bequest values. In theory, it can be used to assess the impact of environmental changes. Another advantage is that calculating the mean and median of WTP is simple. While this method is easy, though, it has been challenged for the inability of respondents to assess non-marketed commodities and services. This could be why respondents are rarely, if ever, asked to do so. Second, people may exaggerate or underestimate the worth of something. It is probable that they're stating a high WTP in the hopes of a change in management policy.

**Research Methodology**

The CVM was utilised for data analysis in this study. This method is an approach to assess WTP of economic good/services that have no clear market price. The market does not own the products and services created in the HLUB, such as wildlife habitat, hydrological functions, attractive scenery, and other tourist prospects. Since there is no effective market for these resources, a variety of economic evaluation approaches for non-market assets have been created. The dependent evaluation technique is the most extensively utilised.

Since there is no real market for the environment to represent its true economic value, a hypothetical market had to be constructed to analyse the public's perception of natural resources. Respondents were asked questions about the conservation of the HLUB. Basic socio-economic data, such as income, origin, and occupation, were also collected. A financial value is collected using CVM and consumer WTP surveys to analyse how well customers are ready to pay for enhanced environmental conservation in HLUB.

Furthermore, the respondent's decision to pay a different price upon entering HLUB can be identified using the contingency assessment method (CVM). Each respondent's responses will be sorted into four categories: "Yes/Yes", "Yes/No", "No/No" and "No/Yes". This CVM approach is appropriate for this study, as it easily determines the level of willingness to pay for conservation in HLUB.

***Random Utility Theory (RUT)***

The CVM is based on Random Utility Theory (RUT), which accepts individual actions and offers options at the maximum degree of utility, where an individual is maximising utilities. Utilities (U) are observable decisive components, utility functions (V), and random components, which an individual obtains from the usage of products or services. Individual utilities have the following functions (3.1.1):

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad (3.1.1)$$

$$V_{ij} = \alpha_{ij} + \beta(Bid_j) + \mu Z_i \quad (3.1.2)$$

where Z is the characteristic of respondents. In addition, WTP minima is calculated based on the formula used by Cameron (1988) as follows;

$$WTP = \alpha / \beta(Bid_i) \quad (3.1.3)$$

***Contingent Valuation Method (CVM)***

The contingent valuation survey uses the following design of the WTP dichotomy option referendum question:

> "*Do you agree to pay the entrance ticket charge for the conservation and improvement purposes of Hutan Lipur Ulu Bendul? Yes or No?"*

$$\log [\text{Prob Yes}/ (1\text{-Prob Y})] = \beta_0 - \beta_1 (\text{RMBid}) + \beta_2 X_2 + \beta_3 X_3 \quad (3.2.1)$$

Xs is a bid value, not a price, from an independent variable that shows taste and preference for the source of interest, where RMBid is the number of pricing tiers inquired of respondents. It should also be mentioned that the following factors can influence visitors' willingness to pay for recreational forest conservation activities:

$$\text{Prob } \{\text{Yes}\} = \text{Prob } \{WTP_{max} > \text{Price}\}; 1(\text{Agree}) \quad (3.2.2)$$

$$\text{Prob } \{\text{No}\} = \text{Prob } \{WTP_{max} < \text{Price}\}; 0 (\text{Disagree}) \quad (3.2.3)$$

$WTP_{max}$ is an individual maximum willingness to pay, whereas Price is bid price proposed for conservation at the HLUB. Because the dependent variable was a dichotomy with a value of 0-1, the study used the Cumulative Distribution Function (CDF) to model regression.

Equations (3.2.2) and (3.2.3) present that if the bid amount offered is greater than a visitor's maximum WTP, then the visitor is unwilling to pay for the proposed amount. If the offer is less than their maximum WTP, they agree to pay the amount in order to maximise the benefit that they can obtain from the area. The estimation presented by Cameron (1988), as cited by Sumambri *et al*. (2020) can be used to assess the average willingness to pay of individuals:

$$\text{Mean WTP} = \frac{\beta 0 + \beta iX}{-\beta 1} \quad (3.1.7)$$

where:

$\beta_0$ = Constant

$\beta_i$ = Socio-demographic variables

$\beta_1$ = Bid price variables

Estimation of visitors' WTP from the environment, this study used a closed-ended technique. Each responder was asked whether they would be WTP an extra fee for the environmental service, with the option of answering "Yes" or "No". Five distinct bid values were allocated to five sets of 30 respondents at random. This offered price bid's purpose is to get the highest WTP for each respondent, either above or below the bid value. As a result, the WTP was calculated using the logistic regression technique (Hanemann, 1984). The probability of a "Yes" answer to a different offer price as one of the independent variables is assessed using this method as below:

$$P = (1 - e - x)^{-1} \quad (3.1.8)$$

where:

P = Prob of answering "Yes" to bid price

x = Budget equation logit regression model

Furthermore, the average WTP will be calculated using the equation below. This equation will result in a curve that depicts the proportion of the study's sample WTP a specific price. The following equations can be used to calculate the area below the curve:

$$E(WTP) = \int_L^U (1 + e^{a+bPRICE}) \quad (3.1.9)$$

$(1+e^{a+bPRICE})^{-1}$ = Prob equation of answering "Yes"

U = Highest bid price

L = Lowest bid price

***Econometrics Model***

A basic model was developed in this study to describe the relationship between dependent and their determinants. The dependent variable is visitor's WTP while the explanatory variables are bid price, income, education level, and age. Multiple regression functions will be employed in the creation of models. A function that determines the relationship between Y and X can be published based on the variables used. As a result, the function of the equation that can be constructed is as below:

$$WTP_i = \beta_0 + \beta_1\chi_{\text{bid price}} + \beta 2\chi_{\text{edu}} + \beta 3\chi_{\text{age}} + \beta 4\chi_{\text{income}} + \mu \quad (3.2.1)$$

where:

WTP = Willingness to pay

$\beta_0$ = Fixed value

$X_1$ = Proposed price to enter HLUB

$X_2$ = Education level

$X_3$ = Age

$X_4$ = Household income

$\mu$ = Random variables

In this case, the visitors were proposed with the bid price, RM *X* for the conservation and improvement and of the HLUB area, besides to determine the worth of WTP.

## Result and Discussion

### *Demographic Background*

The first set of questionnaires aimed to find out the demographic profile of the 150 respondents who visited Hutan Lipur Ulu Bendul (Table 1). Gender, age, education, employment, and household income were among the data collected. Table 1 shows that out of 150 respondents, men comprised 42% of them while women made up 58%. Most of the respondents (72%) were between the ages of 16 and 30. The next most numerous set of respondents were those between 31 and 45 years old (16%), followed by those aged between 46 and 60 (15 respondents or 10%). There were 3 respondents older than 61.

The respondents' educational levels are separated into five categories. Most of the respondents (39.3%) have a university degree and above, followed by those who have completed STPM/Technical/Vocational/ Diploma (38.7%). Only 29 respondents (19.3%) have high school/SPM as their top educational certificate, 2 respondents are in primary school (1.3%) and 2 have no formal education (1.3%).

This study divides respondents into four fields of employment, those who work in the environment field, those who work outside the environment field, those who are still pursuing formal education and those who are unemployed. Only 2 respondents (1.3%) work in the field of environment and 71 respondents (47.3%) work outside the field. 62 respondents are still students (41.3%) and 15 respondents are unemployed (10%).

As shown in the Table 1, most of the respondents (58 or 38.7%) earn RM2,000 and below every month, 38 earn more than RM5,000 a month (25.3%), 32 earn RM2,001-RM3,000 per month (21.3%), 15 earn RM4,001-RM5,000 per month (10%) and 7 earn RM3,001-RM4,000 per month (4.7%).

Table 1: Demographic profiles of the respondents (n=150)

| Variables | Attribute/Value | Number (n) | Percentage (%) |
|---|---|---|---|
| Gender | Male | 63 | 42 |
| | Female | 87 | 58 |
| Age | 16-30 years | 108 | 72 |
| | 31-45 years | 24 | 16 |
| | 46-60 years | 15 | 10 |
| | 61 years and above | 3 | 2 |
| Educational level | Primary school | 2 | 1.3 |
| | SPM/high school | 29 | 19.3 |
| | STPM/Technical/Vocational/Diploma | 58 | 38.7 |
| | University degree and above | 59 | 39.3 |
| | None | 2 | 1.3 |
| Employment sector | Working in the field of environment | 2 | 1.3 |
| | Working outside the field of environment | 71 | 47.3 |
| | Not working | 15 | 10 |
| | Student | 62 | 41.3 |
| Household income [Ringgit Malaysia (RM)] | 2,000 and below | 58 | 38.7 |
| | 2,001-3,000 | 32 | 21.3 |
| | 3,001-4,000 | 7 | 4.7 |
| | 4,001-5,000 | 15 | 10 |
| | 5,000 and above | 38 | 25.3 |

***Knowledge and Awareness of Recreational Forest Conservation***

Table 2 shows the breakdown of the knowledge and awareness of recreational forest conservation among the respondents. The result shows that most of the respondents are knowledgeable about recreational forest conservation. Only 19 (12.7%) respondents said they were unaware of forest conservation while the remainder (131 respondents) heard about it from television, radio, newspapers, publications, magazines, journals, Internet, social media, chat rooms, and other sources. The number of "yes" answers on the awareness of the deterioration in HLUB is presented in Table 2. A total of 126 respondents were aware of the role of recreational forests. However, only 107 respondents knew that forests are a source of carbon and help in carbon creation. Forests contribute to the earth's carbon balance on a global scale. Forests are considered a carbon source if they release more carbon than they absorb. Forests primarily absorb or store carbon in the form of trees and soil. Trees extract carbon from the atmosphere to generate sugar during photosynthesis but they also release carbon dioxide back into the atmosphere during decomposition. Forests collect and release carbon and other gases in a cycle (Kreye, 2020).

For the level of satisfaction with HLUB, 85 (56.7%) out of 150 respondents were satisfied with the condition and environment there while the remaining 43.3% were not. Most responders were unhappy with HLUB's waste management and sanitation. The next question enquires about d the improvements that must be made based on respondents' displeasure. It was suggested that HLUB improve the food stalls and toilet management.

Table 2: Knowledge and awareness of recreational forest conservation and improvement

| | Number (n) | Percentage (%) |
|---|---|---|
| *Have you heard of recreational forest conservation and where did you hear it from?* | | |
| Television/radio | 25 | 16.7 |
| Newspaper/article/magazine/journal | 34 | 22.7 |
| Internet/social media/chat room | 63 | 42.0 |
| Never heard of it | 19 | 12.7 |
| Others | 9 | 6.0 |
| *Are you aware that the quality of recreational forests in Malaysia is deteriorating due to weaknesses by all parties?* | | |
| Yes | 130 | 86.7 |
| No | 20 | 13.3 |
| *Do you know about the role of recreational forests in protection and conservation?* | | |
| Yes | 126 | 84 |
| No | 24 | 16 |
| *If "Yes" (question 3), did you know that recreational forests are a source of carbon and also help in carbon creation?* | | |
| Yes | 107 | 84.9 |
| No | 19 | 15.1 |
| *If "No" (question 3), would you like to know about the role of recreational forests in protection and conservation?* | | |
| Yes | 22 | 91.7 |
| No | 2 | 8.3 |

| | | |
|---|---|---|
| *Are you satisfied with the environment and conservation that has been done at Ulu Bendul Recreational Forest?* | | |
| Yes | 85 | 56.7 |
| No | 65 | 43.3 |
| *If "No" (question 7), what improvements need to be made?* | | |
| Facilities | 8 | 5.3 |
| Garbage management | 32 | 21.3 |
| Conservation of flora and fauna | 3 | 2 |
| Cleanliness of the environment and river water | 10 | 6.7 |
| Others | 2 | 1.3 |

### *Analysis of Stated Willingness to Pay*

Further research was conducted to find out what amount respondents were willing to pay to visit HLUB. Using the dichotomy model in Stata, five data sets were distributed to estimate WTP. As mentioned in the literature review, the percentage of positive responses decreases as the bid amount increases, consistent with the demand theory, which is that, as the higher bid price will lower the WTP. Figure 3 demonstrates that at a price of RM4.00, 63.3% were willing to pay while only 36.7% were not willing. When the offer price was upped to RM6.00, 60% of respondents were willing to pay while 40% were unwilling. When the offer price was increased to RM8.00, the number of respondents willing to pay remained at 60% while 40% were unwilling to pay. The number of respondents willing to pay RM10.00 was only 23.3% and 76.7% were unwilling. When the price was increased to RM12.00, the number of respondents willing to pay dropped to 10%. Thus, it is clear that WTP fell as the price increased.

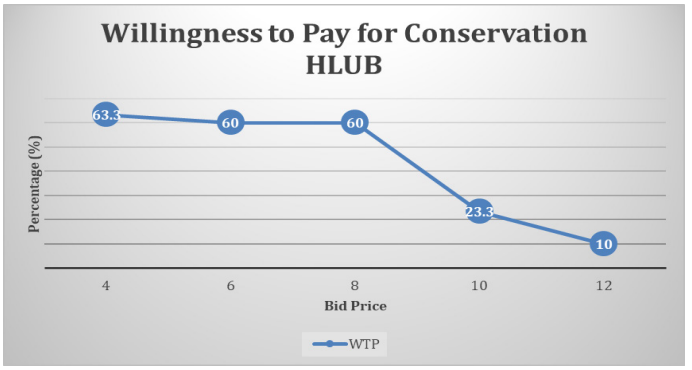


Figure 3: The bid price demand curve demonstrates the probability "yes" to the price offered

### *Regression Analysis*

The regression analysis shown in Table 3 showed that the pseudo $R^2$ for Single Bound CVM is 1.0000, indicating that the independent variables in the model explain 100% of the variance in the dependent variable, but the value for double-bounded CVM is 13.17% which is getting smaller. When McFadden's pseudo value of R-squared is 0-1, a large Pseudo R2 value indicates a higher model fit. As a result, single-bound CVM performed admirably.

Respectively, the discussion that follows is based on the latter. Only income which is one of the three factors examined in double-bound CVM was found to be significant. This indicates that, even though bid1 and bid2 were included in the model, they were not included in the analysis, as shown in the table (Lopez-Feldman,

2012). The bid variable, on the other hand, can be characterised as a connection of a single-bound CVM (Mohd Sharif *et al.*, 2021). The variable bid1 (-.2049) had negative coefficients, which is in line with demand theory. In this case, the lower the WTP, the greater the bid price is.

The positive coefficient values for the income variable indicate that the higher the household income, the higher the WTP for recreational forest conservation and improvement. This finding was also reported by Sumambri and Kamaludin (2020) who tested the affordability of paying for the conservation of the Sungai Sedim Amusement Forest, Kedah and found that the floor income had a significant value of 0.010 below the significance level of 0.1.

Same goes to the education variable, which also had a positive coefficient, implying an inverse relationship with the WTP. As a result, the higher the respondents' level of educations, the higher the WTP, based on the idea that the higher the respondents' level of educations, the greater their knowledge of recreational forest conservation and improvement (FAO, 2021). Hence, they will be more aware of the damage caused by large numbers of visitors. These findings are consistent with Wang and Jia's study (2012), which investigated tourists' WTP for biodiversity conservation and environmental protection of the Dalai Lake protected area. They found that the higher the visitor's education, the higher the WTP.

On the other hand, because age has a negative association with WTP, younger respondents place a higher value on recreational forests. These results reflect those of Dardanoni and Guerriero's (2021) study, which also examined the willingness of young people to pay for environmental protection. They claim that in Italy, young people's marginal WTP is higher and thus, the benefit of environmental preservation is larger for teenagers.

Table 3: Contingent Valuation Method (CVM)

| **Single-bound** | | | | **Double-bound** | | | |
|---|---|---|---|---|---|---|---|
| | **Coefficient** | **Standard Error** | **Significant** | | **Coefficient** | **Standard Error** | **Significant** |
| Bid price | -.2049 | .0427 | 0.000 | | | | |
| Age | -.0230 | .0125 | 0.066 | Age | -.0687 | .0540 | 0.203 |
| Income | .0002 | .0000 | 0.000 | Income | .0007 | .0002 | 0.000 |
| Education | -.0625 | .1512 | 0.679 | Education | .2494 | .6780 | 0.713 |
| Constant | 1.5899 | .7667 | 0.038 | Constant | 5.2247 | 3.0214 | 0.084 |
| $R^2$ | 1.0000 | | | Wald Chi2 (3) | 13.17 | | |

***Estimation of Willingness to Pay (WTP)***

Table 4 shows the estimation of the WTP value. According to the calculation, the respondents' mean WTP for the conservation and protection of HLUB recreational forest area is approximately RM6.81.

Table 4: Estimation of the willingness to pay

| | **Coefficient** | **Standard Error** | **Significant** |
|---|---|---|---|
| WTP | 6.8112 | 0.5247 | 0.000 |

## Conclusion

The purpose of this study is to observe if visitors are willing to pay for the conservation and improvement of HLUB in Kuala Pilah, Negeri Sembilan. The findings show that income has a significant impact on willingness to pay. By using CVM double-bound, the estimated willingness to pay per vehicle entering is RM6.81. Approximately 84% of the 150 respondents were aware that recreational forests like HLUB have a role in environmental protection and conservation, especially as a carbon source and as a carbon producer.

A study in Sungai Sedim, Kedah by Sumambri (2020) found that the tourist income was positively and significantly correlated with the tourists' WTP, which was in line with the finding of this study. Contrary to the results of this study, the visitors' education and age had a significant positive impact on their WTP. According to a survey conducted in the Gelam Forest in Kelantan (Hassin *et al*., 2021) income was strongly linked with WTP. The WTP of the visitors for environmental preservation and forest conservation was RM4.20, which was less than the WTP in this study.

Based on the findings, due to their understanding of forest conservation, respondents with greater levels of education were willing to pay higher entrance fees. Furthermore, there was a negative relationship between age and willingness to pay as younger visitors appreciate recreational forests more. The positive coefficient of income, on the other hand, indicates that high-income households were more willing to spend on HLUB conservation and improvement.

More research is needed to corroborate the findings of this study's WTP estimates (Mohd Sharif, 2021). The role of the study's location in Negeri Sembilan has not been put to the test. Hence, a similar study can be done in others areas with similar socioeconomic features. Furthermore, it will bring several benefits by prioritising recreational forest protection and assessing the possible effects of unsustainable removal and development of recreational forests using alternative research approaches. In addition, the respondents' socio-demographic profile played a significant effect in determining their WTP. Different demographics of respondents, on the other hand, may have an impact on the WTP. The study also shows that to protect recreational forest ecosystems, it is critical to gain support from communities that are directly and indirectly reliant on forest value.

This study also emphasises community conservation awareness and the role of the environment in daily life and ecosystems. As a result, increasing public awareness on the necessity of forest conservation is critical. Furthermore, increased government funding for conservation as well as support is likely to inspire increased domestic efforts and contributions. Also, teaching the younger generation will have a big impact on their willingness to protect the environment, particularly in Malaysia's forests.

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