RESEARCH PAPER

Economic Valuation of Borneo Orangutans at Kemaman Zoo and Recreation Park in Terengganu, Malaysia

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Abstract

The orangutan is a famous and unique species of big ape living in arboreal forests and can only be found in Borneo and Sumatra Island. The orangutans are divided into two subspecies; Borneo orangutan and Sumatra orangutan. They are critically endangered species due to uncontrolled, rapid development activities. In Malaysia, there is an estimation of 12,300 Borneo orangutans undergoing rehabilitation in Ulu Segama Forest Reserve, Sabah, and Lanjak-Entimau Wildlife Sanctuary, Sarawak. These parks are open to the public and have attractions like exotic plants and wildlife, and interesting activities like elephant riding. The introduction of entrance fees to these places may overcome the inadequacy of public funds for conservation and preservation efforts. This study determines the economic value of Borneo orangutans by obtaining an estimated value of willingness to pay (WTP) from visitors and identifies the factors affecting the ability to pay for the conservation of Borneo orangutans in Kemaman Mini Zoo at Terengganu. The method used is the Contingent Valuation Method (CVM) by asking visitors' WTP using a questionnaire. Results show that visitors' WTP is heavily influenced by the bid price, income, and age. Visitors put a higher value on the orangutan and the mini zoo compared to the current entrance fee. This value can be used by zoo operators to make decisions related to the threats of the extinction of endangered species.
Keywords: Conservation, Contingent Valuation Method (CVM), Economic Value, Orangutan, Willingness to Pay (WTP).
JEL Classification: Q01, Q5, Q56.

Introduction

Orangutan is the world's largest tree-climbing mammal endemic to the islands of Borneo and Sumatra. The mammal is categorized as endangered due to habitat degradation, habitat fragmentation, poaching, and forest burning. The orangutans in Sabah and Sarawak, Malaysia are possibly best classified as vulnerable according to the IUCN Red List. Most of their habitats have been transformed into plantations and their forest habitat is rapidly disappearing, hence placing the apes in danger. There is almost no hunting of this species in Malaysia, and most of the remaining populations are found in forests that are protected or under natural forest management. Orangutans are also dubbed as "gardeners of the forest" as they have a significant role in seed dispersal and in maintaining the health of the forest ecosystem. This is important for humans and other animals like tigers, Asian elephants, and Sumatran rhinos. Thus, conserving the habitat of orangutans also helps the indigenous and other species.

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Orangutan is categorized into two sub-species which are Borneo orangutans and Sumatran orangutans. Both subspecies are critically endangered and are on the IUCN Red List of threatened species. Habitat loss is the greatest threat to animals and many parts of forests have been cleared for logging and plantation, especially for palm oil. Unsustainable logging, human settlement, and agricultural activity contribute to habitat loss and degradation of orangutans. Some protected areas however are not well-secured for failing to be following rules, hence this hinders effective patrolling. Many parks are also understaffed and underfunded, therefore oil palm companies and logging firms have intruded on the parks. In some cases, young orangutans are hunted for the illegal pet trade (World Wild Life, n.d.). In doing so, mother orangutans are killed and are separated from their infants. This kind of trade poses a big threat to the survival of orangutans.

Thus, it is important to focus on the need to develop effective conservation strategies that specifically address the problems underlying the decline in the population of orangutans. Maintaining natural forests with feasible wild breeding populations and restoring degraded forests are significant for the continuous survival of orangutans in Malaysia. The future of orangutans will be very much reliant on the long-term security of large, strictly-protected forests with effective control to curb illegal logging and hunting. Conservation efforts are needed to protect orangutans in Malaysia. Meijaard et al. (2011) found that approximately 27% of the people in Kalimantan, Indonesia were not aware that orangutans are protected by law, indicating the lack of awareness among the public warranting for intensive campaigns and awareness programs to support any conservation efforts. On the other hand, conservation efforts for endangered species incur an astounding amount of costs.

Endangered and threatened species are not commonly traded in the open market in comparison to most environmental amenities and natural resources, hence it is a struggle to measure the demand for such goods and services. Most studies relied on the Contingent Valuation Method (CVM) to estimate willingness to pay (Mitchell and Carson, 1989). CVM is a survey-based approach that relies on the economic welfare theory (Boyle, 2003) and has been applied in numerous contexts to elicit the monetary valuations of environmental resources (Damigos et al., 2017). The approach has been used widely as a basis to propose policy reforms and is not limited to projects related to recreational value and protection of open access resources. Additionally, it mainly observes the health impacts of exposure to pollutants and pollutions, provision of water services, hunting and fishing permits in national parks, and biodiversity protection (Carson, 2012; Hanley et al., 2013).

Previous studies were conducted to elicit the willingness to pay (WTP) for conservation of targeted species, and this study is the first to monetize and place value on orangutans or apes via CVM, where the location of the study is not endemic to the species and there is no direct connection to the orangutans. Kerstin et al. (2014) conducted Choice Experiment (CE) assessment on orangutans in Sarawak (East Malaysia) where the place is endemic to the species. The study calculated about USD6.6 million per year could be obtained for wild orangutan conservation from voluntary contributions by tourists; about 60% of tourists are willing to pay for the survival of the wild orangutan population. Martín-López et al. (2008) listed previous studies estimating people's WTP for species conservation using CVM for birds, fish, invertebrates, mammals, and reptiles. Generally, the estimation from CVM studies is acquired from either WTP to evade loss of species or WTP for a proposed gain in quantities. For other species, Nabin et al. (2007) applied the contingent valuation survey to estimate households' WTP for the conservation of white-rumped vulture *(Gyps bengalensis)* in South Asia which is categorized as critically endangered (severely declining population). The estimated aggregate benefits of vulture conservation at local, district and national levels were NRs 125,994, NRs 5,989,882, and NRs 510,117,491, respectively. Meanwhile, Catherine et al. (2013) estimated the WTP for proposed wolf management and damage plans

in Minnesota using CVM.

Previous CVM studies were criticized for their monetary valuations to be biased through information and eliciting effects, hypothetical bias, starting-point bias, and strategic bias (Duffield and Patterson, 1991; Hausman, 2012). Nevertheless, the weaknesses of CVM can be solved if a survey is carefully designed particularly in sampling procedures, the realism of scenario, a clearly defined scope, inclusion of appropriate validity check, incentive compatibility, and consequentiality of selected payment vehicle (Carson, Kling, Phaneuf, and Zhao, 2012; Haab et al., 2013; Johnston et al., 2017; Mitchell and Carson, 1995). Moreover, experts from National Oceanic and Atmospheric Administration (NOAA) justified that CVM is reliable based on its estimations which were brought in a court in the case of Exxon Valdez oil spill (Arrow et al., 1993). This shows that WTP estimation through CVM has vital information for authorities and policymakers. Moreover, the use of CVM in biodiversity conservation policies offers valuable information regarding conservation strategies if questionnaires are carefully constructed, respondents are appropriately informed, and determinants affecting willingness to pay are estimated.

This study concentrates on the conservation of Borneo orangutans in Kemaman Zoo and Recreation Park, Terengganu since the mammals are listed as critically endangered species under the IUCN Red List. The objective of this study is to estimate visitors' WTP for the conservation trust fund of Borneo orangutans and investigate the determinants that significantly affect the visitors' WTP for the trust fund. This study may valuably add to the growing literature on the non-market valuation of wildlife conservation. The novel contribution of this study is the idea of public experience in terms of depletion of species which they would be able to evade by allocating a certain amount of money to mitigate the effect, to prevent the welfare change from occurring, and to promote conservation. This leads towards policy reform in terms of including the public to participate in conserving the country's endangered species.

This paper is organized as follows: Section one describes the status of orangutan species, the importance of conserving the animals, and previous studies on the economic valuation of endangered species. Section two demonstrates the site sampling and methods employed to estimate the visitors' WTP. Next, section three reports the data and analysis of the survey outcomes performed on 252 visitors, and finally, section four summarises the findings of this study and recommendations to the government.

Study Site and Survey Methodology

Kemaman Zoo and Recreation Park, Terengganu

Kemaman Zoo and Recreation Park (TRZK) is the only zoo located on the east coast of Peninsular Malaysia. With a breadth of 35 acres, the park is a combination of a mini zoo, garden, fruits, herbs, orchids, tropical plants, bonsai, and a water theme park. The park plays a vital role as an ex-situ center for wildlife conservation and reservation for lions, tigers, tapirs, orangutans, and many more. It also provides knowledge about flora and fauna to visitors. In this study, a map of TRZK is provided to respondents during the contingent valuation survey to give a clear illustration of animal distribution at the park as shown in Figure 1.

Figure 1. Map of Kemaman Zoo and Recreation Park (TRZK), Terengganu
Source: Kemaman Zoo Map (2020).

Borneo orangutan *(pongo pygmaeus)* is one of the attractions at the park. The Borneo orangutans differ in appearance from the Sumatra orangutans, in which the former has a broader face, shorter beard, and slightly darker color. The lives of Borneo orangutans are at stake at the moment. The species is listed as endangered under the IUCN Red List of threatened species and is protected under the law because of forest or habitat loss and illegal hunting. Currently, a statistic by the IUCN Red List shows that Borneo orangutans have decreased by more than 60% between 1950 and 2010, and a further 22% decline is projected to occur between 2010 and 2025 (World Wild Life, n.d.).

Presently, the zoo entrance fee to TRZK is RM10 for adults and RM7 for kids. The significant establishment and maintenance cost per se brings the question of what is the conservation value generated from the park? Although as claimed by the zoo management that its role has grown to prioritize more in education and conservation, the entrance fee is mainly seen to cater for operational costs. Since the price imposed does not truly depict the satisfaction obtained by visitors from the conservation value of the animals, an estimated WTP among the visitors based on their awareness and conservation interest, therefore, gives a better estimation of the conservation value of the Borneo orangutans.

Survey Design

A final field survey was conducted between January and February 2018 among visitors of TRZK, Terengganu who anticipated seeing orangutans. This study does not separate the local and foreign visitors as the entrance fee is similar for both groups. Furthermore, the number of foreign visitors at the zoo is very low because they mostly prefer to visit the biggest zoo in Malaysia situated in the capital city of Malaysia, Kuala Lumpur which is Zoo Negara. Approximately 252 respondents were selected randomly for the field survey using face-to-face interviews and a structured questionnaire. Mitchell and Carson (1989) highlighted that it is appropriate and reliable to conduct CVM if the sample size comprises between 200 and 2500. The survey and its design were thoroughly tested before the implementation. Dividing and randomization of offered price bids were tested in a pre-test survey to avoid confusion

and bias. The WTP scenario and certain elements of the survey were pretested, together with a pilot survey on 50 visitors of the park. After the pilot survey, the survey time was shortened and instructions for answering the questions were improved. Respondents in the pre-test were excluded from the final survey. The payment vehicle used to elicit WTP was the entrance fee which is a mandatory payment to the park. Contradictory to other surveys, the CVM surveys involved the detailed description of a scenario that constructs a hypothetical market for the respondents (Carson, 2000). Nonetheless, the hypothetical situation needs to be maintained as close as possible to the real situation (Cummings and Taylor, 1998). Examples of the flow of contingent valuation questions are presented in Figure 2.

Implications of Improvements in Conservation of Borneo Orangutan
We would like to know how strongly you may support an increase in the entrance fee to Kemaman Zoo & Recreation Park (TRZK) for improvements in conservation efforts and activities of endangered species, Borneo orangutan, which may introduce additional costs to your visit. Let's focus on the possible actions in the race against time to save the species from becoming extinct such as operation and maintenance costs for food, medicine, breeding programs, park facilities, and awareness campaigns. It is also significant to conserve the species for the sake of our curiosity and aesthetic appreciation.

Costs of the Implementation Plan
The management of the park has an essential role in conservation programs which entail a substantial increase in costs. Financial constraints and limited budgets will distort the efficiency of conservation plans for the species. On the other hand, huge annual investments are needed to reduce the extinction risk for threatened and endangered species.

Implementation of Plan
The management of the park would request visitors to pay a new proposed entrance fee to the park to implement the conservation plan. The new entrance fee's sole purpose would be to finance the efforts for positive actions towards conservation efforts of Borneo orangutan, as benefits of conservation accrue to the global community and significant costs are associated with the plan.

WTP Questions
Bearing in mind your current income, besides your expenses for housing, food, utilities, clothing, entertainment, saving, and etcetera, please think about how much you would be willing to pay to support the conservation program. Kindly assume that your new entrance fee would be collected by the management of the park.

In this scenario, the visitors of the park have the opportunity to vote for such a plan but they need to bear the associated costs. If a majority of visitors vote for the plan, the plan would go into effect and every visitor would have to pay for the new increment in the entrance fee. If a majority of visitors vote against the plan, no one would have to pay the new entrance fee but the current situation for Borneo orangutans would continue to decline. Remember that the sum collected would be used entirely for implementing the plan.

*If you were asked to pay an entrance fee to the park of approximately **RM12**, would you vote for a new entrance fee to fund the conservation of Borneo orangutans?*

       Yes_____ (go to Question a.1)   No _____ (go to Question a.2)

*a.1. If Yes, would you be willing to pay **RM14**?*
        Yes _____   No_____

*a.2. If No, would you be willing to pay **RM10**?*
        Yes _____   No_____

Figure 2. Examples of Contingent Valuation Questions in Questionnaire
Source: Research finding.

Contingent Valuation Design

This study employed a discrete choice contingent valuation scenario for the visitors of TRZK to infer their willingness to pay for the conservation trust fund of Borneo orangutans. The trust fund covers activities and conservation efforts to maintain the endangered species. The scenario estimated an aggregated value for all these benefits. Nevertheless, a regression analysis of the answers to the contingent valuation questions could disaggregate the contribution of singular components to this aggregated value.

This study used a double-bounded question format which is a method that improves a second binary question based on the answer in the first round. The single-bounded question asked visitors to state whether they would pay (give up) or would not pay a specific amount of money for the conservation of Borneo orangutans. The double-bounded question, following the same scenario, offered a higher amount of money if the answer to the single-bounded question was "Yes", and a lower amount of money if the answer to the single-bounded question was "No". The double-bounded dichotomous choice approach is more efficient than the single-bounded method (Kanninen, 1995). The second bid relies on the first bid, while the two bid levels are dependent, leading to the first bid "anchoring" the WTP (Cameron and Quiggin, 1994).

This study designed the proposed price bid based on the analysis of the single-bounded question included in the pre-test survey. To increase the accuracy of WTP distribution across the survey sample as a whole and to decrease the likelihood of starting point bias, the procedure also randomly varied the price bid amounts (Veronesi, Alberini, and Cooper, 2011). This study offered five groups of proposed price bids for the entrance fee which were made up of a 20% increase and decrease from the current entrance fee of RM10 to the park. The proposed price bids for new entrance fees were RM12, RM14, RM16, RM18, and RM20.

The double-bounded CVM conveyed the respondents' preference for the conservation of Borneo orangutans based on their replies in two binary questions. In particular, their true WTP (y_i) was reflected in one of four possible ranges for $L_i \leq y_i \leq U_i$, where L_i and U_i signified the lower and upper limits. The probability responses in the double-bounded CVM are as follows:

Probability (*Yes, Yes*) $= \text{Prob } (t_2 \leq y_i \leq \infty)$ (1)

Probability (*Yes, No*) $= \text{Prob } (t_1 \leq y_i \leq t_2)$ (2)

Probability (*No, Yes*) $= \text{Prob } (t_2 \leq y_i \leq t_1)$ (3)

Probability (*No, No*) $= \text{Prob } (0 \leq y_i \leq t_2)$ (4)

The above equations demonstrate y_i as the respondent's true WTP for Borneo orangutans' conservation programs, t_1 is the first price bid offered in the first round, and t_2 is the second price bid offered in the second round of the contingent valuation study. Consecutively, this study assumed that the model can be represented as follows:

$$y_i = x_i \beta + \varepsilon_i \tag{5}$$

According to Hanemann (1984), the upper bid values for "Yes, Yes" responses were not truncated, as a "Yes" answer to the second bid did not portray the maximum WTP, but instead was a lower bound for WTP of that value. The maximum likelihood equations are as follows:

$$L_i (\mu|t) = \text{Prob } (\mu + \varepsilon_i > t_2)^{Yes, \, Yes} \tag{6}$$

$$L_i (\mu|t) = \text{Prob } (t_2 - \mu > \varepsilon_i > t_1 - \mu)^{Yes, \, No} \tag{7}$$

$$L_i (\mu|t) = \text{Prob } (t_1 - \mu > \varepsilon_i > t_2 - \mu)^{No, \, Yes} \tag{8}$$

$$L_i (\mu|t) = \text{Prob } (\mu + \varepsilon_i < t_2)^{No, \, No} \tag{9}$$

where:

L_i = the maximum likelihood of a WTP result

μ = mean

ε_i = a random error component

t_1 = first bid

t_2 = second bid

YY = (Yes, Yes) bid responses

YN = (Yes, No) bid responses

NY = (No, Yes) bid responses

NN = (No, No) bid responses

This study followed Hanemann (1989b) that the integration should not be extended to include negative WTP values because the WTP studies offered poor approximations of negative WTP or willingness to accept (WTA) compensation. Moreover, Loomis and Ekstrand (1998) pointed out that participants may have a negative WTP if there are any issues related to a misconception of the good or context.

Results and Analysis

The sample of this study consisted of 252 visitors to the TRZK. This study applied *Stata* econometric software to regress and analyze the data. The socioeconomic characteristics of the respondents are summarised in Table 1. Notably, the respondents were informed that this study will benefit the species via planned conservation activities.

Table 1. Demographic and Socioeconomic Characteristics of Respondents (n=252)

Characteristics	Frequency	Percentage (%)	Mean	SD
Gender				
Male	170	67.3		
Female	82	32.7		
Race				
Malay	235	93.3		
Chinese	17	6.7		
Age				
≤20	2	0.7	35.02	8.358
21-30	77	30.7		
31-40	111	44		

Characteristics	Frequency	Percentage (%)	Mean	SD
41-50	47	18.7		
51-60	13	5.3		
>61	2	0.7		
Education				
Primary/ Secondary	55	21.83		
Diploma	45	18		
Bachelor Degree	110	44		
Master/PhD	42	16.6		
Occupation				
Government	98	38.7		
Private	77	30.7		
Business	49	19.3		
Student	15	6		
Retired	2	0.7		
Unemployed	11	4.7		
Monthly Income (RM)				
Less than RM1,000	27	10.7	3185	1717.38
RM1,001 – RM2,000	30	12		
RM2,001 – RM3,000	71	28		
RM3,001 – RM4,000	50	20		
RM4,001 – RM5,000	42	16.7		
> RM5,001	32	12.7		

Source: Research finding.

Preferences for and against the Conservation of Borneo Orangutans

Following the survey's scenario description, all 306 participants were requested to state whether they had a preference for or against the conservation of Borneo orangutans. A total of 19 participants failed to state their preference for or against conservation or did not provide important socio-demographic details in the final part of the survey, and thus, their responses were omitted from the results, leaving 287 remaining observations. The omission is significant to precisely replicate the proportion of participants who were against the conservation of Borneo orangutans, and consequently, the impact of these participants with genuinely zero WTP on the mean and total WTP. Table 2 explains the total number and proportion of the responses. A total of 252 visitors (87.7%) of the total respondents who provided a complete response stated a preference to conserve Borneo orang-utans. Only these individuals were subsequently invited to take part in the bidding process to express their WTP for the newly suggested entrance fee to the park to conserve Borneo orangutans.

Table 2. Visitors' Preferences for and against the Conservation of Borneo Orangutans

Response	Frequency	Percentage (%)
For conservation of the species	252	87.7
Against conservation of the species	35	12.3
Total	287	100

Source: Research finding.

Visitors who rejected the idea to impose a new entrance fee for the sake of conserving Borneo orangutans were asked to provide reasons as presented in Table 3 to examine their negative responses towards the idea of the program. Most of the visitors (36%) believed that

the role to conserve endangered species falls on the government. They rejected the idea of public participation in protecting and conserving endangered animals. In contrast, the least cited reason (4%) stated by the visitors as they did not believe that the conservation trust fund will solve the problem. Notably, several respondents were curious about the fund utilization in reality.
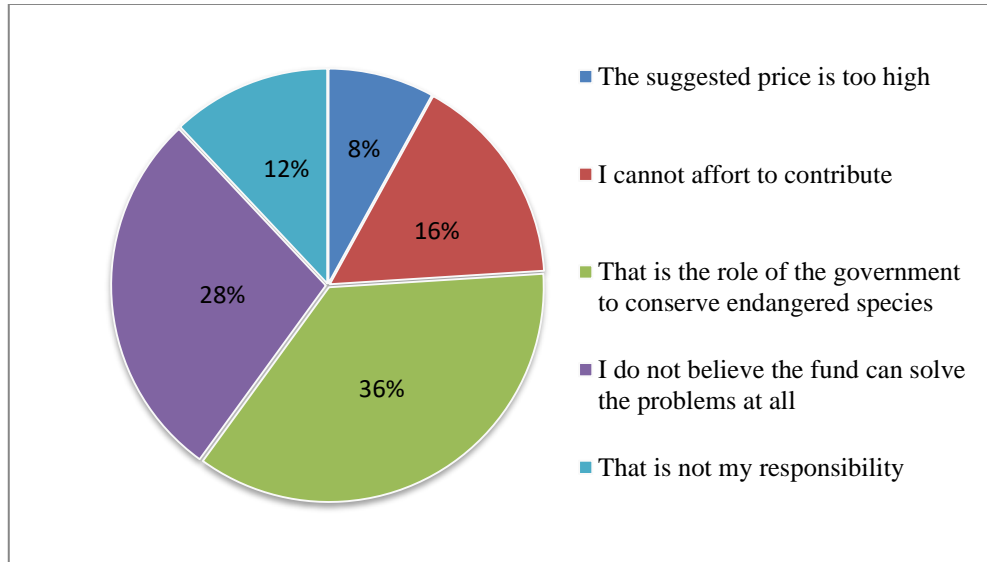

Figure 3. Reasons the Visitors are not Interested to Contribute to the Conservation Trust Fund
Source: Research finding.

Survey and Bid Elicitation Responses

The double-bounded CVM offered four outcomes such as "Yes/Yes", "Yes/No", "No/Yes", and "No/No" in two rounds of bids. In the first round, as expected, the bid amount of the new entrance fee increased as the proportion of individuals responding with positive answers went down. This was in line with the demand theory that states as the price increases, the quantity demanded decreases. It shows that the respondents were sensible to the bid amounts offered during the survey as shown in Table 3.

Table 3. Visitors' Responses on the First Bid in the Survey in Percentage

Responses	First Bid					
	RM12	**RM14**	**RM16**	**RM18**	**RM20**	**Total**
Yes	86.67	90	56.67	46.67	43.33	64.67
No	13.33	10	43.33	53.33	56.67	35.33
Total						100

Source: Research finding.

Table 4 classifies the percentages of those who accepted or rejected the first bid, and the proportion of the sample proceeding to either accept or reject the second bid based on the 252 observations expressing a preference for the conservation of Borneo orangutans. Approximately 64.7% of the respondents in favor of conserving orang-utans answered "Yes" to the first bid, but only 40.7% of these respondents accepted the second; a higher bid. Apart from that, 24% of respondents rejected the first bid, while 22% of the whole sample responded "No/No" to both binary questions. Respondents who answered "No/No" to the two rounds of questions were recognized as the protesters towards the execution of a new entrance fee to the park.

Table 4. Visitors' Responses to Two Rounds of Price Bids

		Second Price Bid		
		Yes	**No**	**Total**
First Price Bid	**Yes**	124 (40.7%)	39 (24%)	163 (64.7%)
	No	69 (13.3%)	20 (22%)	89 (35.3%)
	Total			252 (100%)

Source: Research finding.

First, this study estimated WTP econometrically using the Logit model for single-bounded CVM in the first round with no control variables as shown in Table 5.

Table 5. Logit Model Regression on First Bid in the CVM

Response 1	Coefficient	Std. Err	P > |z|	[95% Conf. Interval]	
First Bid	-1.9125	0.0410	0.002	-0.2717	-0.1107
Constant	3.4949	0.6863	0.004	2.1497	4.8400

Source: Research finding.

The Logit model regression demonstrated that the first price bid variable was statistically significant at a 5% level and in line with the bid price increase which decreased the probability of a positive response, signifying a negative relationship. Usually, WTP is estimated using the formula in Equation 10. However, the WTP in the current research was calculated as per Equation 11.

$$\text{Willingness to Pay} = \check{z}\text{'} \left[-\frac{\alpha}{\bar{\delta}} \right] \tag{10}$$

$$\text{Willingness to Pay} = -\hat{\alpha} / \hat{\delta} \tag{11}$$

No explanatory variable was included in the model, where α is a scalar and z is equal to one, hence, the formula was simplified as shown in Equation 11.

Table 6. Estimation of the WTP's first bid in the CVM

Response 1	Coefficient	Std. Err	P > |z|	[95% Conf. Interval]	
WTP	18.2670	0.6825	0.001	16.9292	19.6047

Source: Research finding.

Table 6 indicates that when no control variable was included in the estimation in the first round of CVM, the result shows that those visitors were willing to pay an average of RM18.26 for the entrance fee to the park. On the other hand, the application of the double-bounded approach allowed the efficient use of the data to determine WTP with the assumption that a single valuation function existed behind both answers (Cameron and Quiggin, 1994). The regression in double-bounded CVM with control variables, namely income and age, is revealed in Table 7.

Table 7. Regression of Double-bounded CVM

		Coefficient	Std. Err	P > |z|	[95% Conf. Interval]	
Beta	Income	0.0032	0.0003	0.001	0.0025	0.0038
	Age	0.1415	0.0468	0.002	0.0498	0.2333
	Constant	3.4249	2.0027	0.087	-0.5006	7.3501
Sigma	Constant	3.5520	0.3681	0.001	2.8307	4.2735

Source: Research finding.

Income and age were statistically significant at a 5% level with a positive relationship; as the price bid offered increased, both variables increased in the second round of CVM. As income increases, visitors can pay at higher prices, thus they are willing to pay a new suggested price to support conservation activities. Figueroa et al., (2016) mentioned that the income of respondents brought a major impact on their commitment to pay for a conservation program in Mexico. The determinant of income demonstrates a positive motive to commit to a conservation program. Determinant of age demonstrates as age increases, visitors realize the importance of conservation of Borneo orangutans, thus their willingness to pay to support positive actions towards orangutans increase. The socioeconomic determinants are in line with Sengkhamyong, Kyophilavong, Pommavong, Chanthasene, and Chanthanivong, (2018) findings which mentioned that the determinants are relevant to individual decisions to protect wildlife protected areas.

Table 8. Estimation of the WTP's Second Bid in the CVM

Response 2	Coefficient	Std. Err	P > |z|	[95% Conf. Interval]	
WTP	18.59	0.4022	0.001	17.8005	19.3774

Source: Research finding.

Table 8 shows that WTP estimation in the second round of the CVM using the mean values for explanatory variables was RM18.59 and significant at 5% level.

Conclusion and Policy Recommendation

An increase in the entrance fee can improve the welfare of animals, zoo management, sufficient facilities, and services to visitors. By suggesting new prices, at least the animals can live in proper condition towards promoting their conservation status. Zoo operators are not making business to look after the animals which involve extravagant cost and huge investment. This study portrays the estimation of single-bounded and double-bounded approaches of CVM. The single-bounded CVM estimated the visitors' WTP for Borneo orangutans' conservation fund as RM18.26. Moreover, in the second round of double-bounded CVM, the estimation of average WTP slightly increased from the previous value at RM18.59. The double-bounded CVM was able to improve the efficiency of WTP estimation with two rounds of dichotomous questions. The study demonstrated that the visitors were willing to pay more for the entrance fee to the park compared to the current fee of RM10. The difference between the current fee and the new calculated current fee was RM8.59, based on the second round of bidding price. The estimation of WTP with the new suggested entrance fee indicates the visitors' effort to contribute to conserving the Borneo orangutans. The valuation methods proved that the visitors realized that Borneo orangutans are critically endangered species and more precautious steps should be taken immediately to conserve the mammals.

As one of the oldest rainforests in the world, the natural treasure functions as the earth's "lungs" and is home to fascinating plants and animals including endangered local species like Borneo orangutans. The conservation trust fund is a platform for conserving the natural heritage for the future generation. Orangutans exhibit unique and rich personalities as they provide models for human behaviors in terms of physiology, cognition, and evolution. Conservation of the species is essential as the orangutans are an underpinning species. As the orangutans disappear, it indicates the disappearance of thousands of other animals and plant species in the fragile tropical rainforest habitats. In this sense, saving orangutans and their habitats mean saving other species that co-exist with them. The decline of these animals may cause a chain reaction that changes the entire ecosystem. The proposed conservation trust

fund can at least provide for capacity building, training, law enforcement, and on-the-ground enforcement and monitoring to assist the state rangers towards ceasing the poaching and trafficking of the species. Hence, growing societal awareness for research and development, as well as changes in policy, practice, and law are vital to support a sustainable ecosystem and optimal use of natural resources.

Although orangutans are not endemic to the state of Terengganu where the study was conducted, or to Peninsular Malaysia, the views shared by the TRZK's visitors are nonetheless important because they represent the general public who are willing to spend money to visit and enjoy the zoo where the Borneo orangutans are kept and conserved. Hence, it is important to keep the species healthy and well-maintained in East Malaysia which is endemic to the Borneo orangutans. The findings on their WTP the new entrance fees to include conversation funding is vital to show that although the majority of visitors are still thinking that conservation is not part of the public responsibilities and it should fall back on the government, some are more than willing to contribute. Their willingness to pay extra exhibits their inclination to participate in the conservation of orangutans and other endangered species. On the other hand, the government should make some policy changes to make conservation a part of the public contribution. The new suggested price at least will help to determine the future of Borneo Orangutans as their population is decreasing about 25% over 10 years. Following the establishment of wildlife conservation legislation as a political priority, policymakers then can decide or at least influence decisions to put resources, such as funding, and its conservation, which if successful would safeguard long-term conservation efforts. Increased education and awareness programs must be carried out to get more public participation in conservation efforts. Contribution from the public, whether the local communities or the general public, whether in monetary forms or otherwise, is part and parcel of the collaborative management approach which is an essential element in achieving the Sustainable Development Goals (SDGs). This approach should be embraced and adopted by Malaysia to ensure that the sustainability efforts are not just for the endangered species but the whole ecosystem. Besides, the federal government has portrayed a great interest in formulating various policies and mechanisms to protect endangered species, but it is also required the cooperation of the state governments to protect the ecosystem too. The cooperation between the parties is effective if the related department admits the fact that there are weaknesses and loopholes in their legislation and strong political will to advocate the changes. The key point that requires to be addressed for policymakers is to ascertain proper conservation management backed by an economic rationale for the endangered species.

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