WILLINGNESS TO PAY FOR BORNEAN ORANGUTAN CONSERVATION IN SARAWAK, MALAYSIA

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ABSTRACT

Although endangered and protected by the strongest regulations on the island of Borneo, Bornean orang-utans are threatened by forest loss, habitat degradation, and poaching. The overall population of Bornean orangutans is estimated to be only 104,700 in total, which is less than half of the population a century ago. Thus, this study aims to measure the non – market value of the conservation of Bornean orangutans in Sarawak, both in Matang Wildlife Centre (MWC) and the Semenggoh Wildlife Centre (SWC). Applying the contingent valuation method (CVM), non - visitors' willingness to pay (WTP) for the entrance fee of SWC and MWC in order to conserve Bornean orangutans were measured. Overall, the respondents show positive attitude towards conserving Bornean orangutans. 90% of the 600 respondents vote in favour of Bornean Orangutan Conservation Program, while the mean WTP is RM206.98. They also believe that it is everyone's duty to ensure that plants and animals today will exist for the future generations. The results of this study will be useful for the Sarawak Forestry Corporation (SFC), government and researchers alike to manage and conserve Bornean orangutans and other endangered species more efficiently.

Keywords: Bornean orangutan, Willingness to Pay, Contingent Valuation, Economic Valuation,

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1. INTRODUCTION

Preserving endangered species is a crucial undertaking to sustain biodiversity and ensure the stability of ecosystems, guaranteeing the resilience of ecosystems and the supply of critical necessities like unpolluted air, water and rich soil. Furthermore, safeguarding these species ensures the maintenance of genetic variety, which is crucial for adapting to evolving environmental circumstances and ensuring ecological well – being for future generations. Bornean orangutans, an extremely endangered species, confront significant perils due to the degradation of their habitat, illegal hunting and the impact of climate change. Protecting these primates is crucial, not just for their survival but also for the conservation of the rainforest habitats they live in.

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The Bornean orangutan is a red-orange haired orangutan that can weigh up to 200 pounds and stand 3.5 to 4.5 feet tall with arms that can extend up to 8 feet (WWF, 2022). The population is assumed to be made up of three to four sub-populations, with the possibility of more undiscovered sub-species (Morrogh-Bernard, Husson, Page & Rieley, 2003). Native to the Borneo Island, the population of Bornean orangutans is estimated to be 57,350 individuals, with a small population (estimated to be less than 2,000 individuals) of the north-western subspecies surviving in woodland near the Indonesian border of Sarawak, on the Malaysian side of Borneo (Acrenaz, Gumal, Marshall, Meijaard, Wich & Hussons, 2018). The exact estimation of total population of the Bornean orangutans is difficult to obtain, as the numbers dwindle due to numerous factors that cause their population to decline drastically since mid-20th century.

The world's three orangutan species, Sumatran (pongo abelii), Bornean (pongo pygmaeus) and Tapanuli orangutans (pongo tapanuliensis) are all critically endangered, according to the International Union for Conservation of Nature's (IUCN) Red List of Threatened (Ancrenaz et al., 2018). Other than the proboscis monkey, the Bornean orangutan is one of the intriguing animals on Borneo Island (Meijaard & Nijman, 2003). The Bornean orangutan is thought to be the largest remaining species of orangutan, however, there is no accurate figure for its overall population. In 2016, the IUCN projected that the overall population of the Bornean orangutan would be approximately 104,700 individuals, down by over half of the total population in the year 1973, which was 288,500 individuals. The overall number of Bornean orangutans is expected to plummet to only 47,000 by 2025 if the current trends continue. This indicates that the Bornean orangutan population is declining at an alarming rate despite the ongoing conservation efforts.

The increasing rate of environmental modification has a substantial impact on the population of endangered species in the wild. It goes without saying that exploitation of natural resources is frequently one of the factors of the economic success of a nation. Sugardjito and Schaik (1992) suggested three main risks to orangutan populations: a) hunting for meat and pet trade, b) mass deforestation of orangutan habitats, and c) the continuous exploitation of the remaining forest. The behavioural and reproductive concerns that are unique to each species are also included as the main factors for the declining population of the Bornean orangutans. Due to habitat degradation, their population has decreased by more than half in the last 60 years (Gregory et al., 2012). The clearing and fragmentation of forests for oil palm plantations and to accommodate an increasing human population has led to more significant habitat loss, which is exacerbated by wildfires and climate change (Sodhi, Koh, Brook & Ng, 2004; Wich, Gaveau, Abram, Ancrenaz & Baccini, 2012; Gregory et al., 2012).

Moreover, orangutan numbers are under threat from killing and capture for pet trade (Ancrenaz et al., 2018; Wich et al., 2012). One of the most serious dangers to biodiversity conservation is human-caused wildlife mortality (Hoffmann et al., 2010). Unsustainable 'use' of wildlife resources such as animals has led to 26% of all known species being ranked as endangered globally. Overexploitation causes population declines, which can lead to local or global extinctions if not properly managed. Moreover, policies aimed at preventing or limiting exploitation can be difficult to enact and enforce, especially when wildlife is slaughtered illegally by rural populations (Lyons & Natusch, 2012). The Bornean orangutans are especially vulnerable to these risks as they require

a vast forestation habitat to ensure their shelter and food source, and their reproduction rate is relatively low compared to other species.

Besides that, they are also killed at a high rate for a variety of reasons, the most common of which being the orangutan meat trade and because defensive farmers whom believe that they are a threat to their crops (Brubaker, 2010). Therefore, it is important for the responsible authorities and policymakers to enact laws and regulations in order to conserve their habitat besides stopping poaching activities to ensure the protection of Bornean orangutans. The remaining Bornean orangutans in Malaysia are housed at Matang Wildlife Centre (MWC) and Semenggoh Wildlife Centre (SWC) in Sarawak, and Ulu Segama Forest Reserve in Sabah, among other places. These parks are available to the public and feature wildlife as well as ecotourism activities like jungle trekking. Entry fees into these protected areas can assist to compensate for the lack of public finances available to protect and conserve the species.

Hence, it is crucial to conduct economic valuation of Bornean orangutan conservation in efforts to make sure the longevity of the species. It aims to quantify the products and services provided by non – market resources, such as environmental resources. The economic worth of an environmental resource is often determined by the price that resource consumers or society as a whole are prepared to pay. When an environmental resource just exists and products and services provided at no cost, the consumers and non – consumers' desire to pay alone indicates the resource's worth in delivering such commodities, regardless of whether actual payments are made. Economic valuation is a method that assists in making difficult decisions as environmental resources are intricate and multifunctional, and it is unclear how the plethora of products and services they give impact human welfare.

Thus, this study aims to determine the economic value of Bornean orangutans by estimating the willingness to pay (WTP) among ecotourism non-visitors and identifying factors influencing the ability to pay for the conservation of one of the threatened species, Bornean orangutans at the MWC and SWC. Using questionnaires, the contingent valuation method (CVM) is used to elicit the respondents' WTP. CVM gauges the significance of non – visitors' WTP for conservation objectives by explicitly inquiring about the amount they would be ready to donate monetarily to endorse particular conservation initiatives. This approach commonly entails conducting surveys in which participants express their willingness to pay for hypothetical situations related to conservation initiatives.

The acquired WTP data from these surveys is subsequently analysed to evaluate the overall economic worth that tourists assign to conservation activities, so emphasising the importance and public backing for these endeavours. The projected values will be used by the conservation site operator to make decisions regarding the threats of endangered species extinction. By examining the perspectives of ecotourism consumers, this study contributes to the understanding of the concerns regarding the conservation of Bornean orangutan in Sarawak, Malaysia. Furthermore, the findings may be utilized by policymakers in reacting to national agendas to conserve national historical and natural assets in order to sustain the Bornean orangutans' considerable endemic and aesthetic worth.

2. LITERATURE REVIEW

2.1 Economic Valuation of Natural Resources

The economic valuation method is a method for determining the monetary value of public goods and services, as well as natural resources. It is used to determine the economic value of public goods such as natural resources in the environment. The valuations must be estimated using non-market valuation methodologies. Non-market valuation is defined by Batement, Carson, Day, Hanemann, Hanley and Hett (2002) as the process of assessing the monetary worth of products and services in the absence of a market system, a limited market, or an incomplete market. The methods for determining the value of non-market goods and services are commonly through the revealed preference and stated preference approaches. Disclosed preference or revealed preference is based on actual market behaviour of ecosystem goods and services users (Boyle, 2003).

According to Asafu – Adjayye, Brown and Straton (2005), the revealed preference approach demonstrate individuals' behaviour in actual or simulated marketplaces to infer the worth of an environment good or service. This hypothesis was first credited to Samuelson (1948), who conducted consumer behaviour research in the methodology of revealed preferences. The advantage of the revealed preference technique is that it is based on actual decisions made by individuals. Representative approaches in revealed preferences are the travel cost method (TCM) and the hedonic price method (HPM). On the other hand, stated preference method evaluates the worth of non-market items by examining consumers' stated behaviour in a hypothetical situation. Not only may stated preference be applied to the majority of goods and services in an ecosystem, but they can also be used to estimate the consumers' preference structure (Kroes & Sheldon, 1988).

According to Mitchell and Carson (1989) the core aspect of the stated preference technique is the use of questionnaire to ask individuals directly about their economic values for the natural resources in question. Other key data categories for the assessment of ecosystem services such as stated perceptions, attitudinal scales, previous knowledge and so on are easily obtained using stated preference methodologies. Thus, stated preference methods can be a good approximation of the relative importance that stakeholders attach to different ecosystem services, reveal potential conflicts between stakeholders and provide alternative management options (Nunes, 2002; Nunes, Silvestry, Pellizzato & Boatto, 2008). Choice modelling (CM) and contingent valuation method (CVM) are among the methods used in stated preference approach (Bateman & Turner, 1992). Individuals will be asked about their WTP as well as their preferences for goods and services, which will then be used to calculate the entire economic worth of both use and non-use value of an environmental good or service.

2.2 Analysis of WTP for Conservation and Environmental Purposes

Aside from CVM, various other methodologies are employed to assess the public's WTP for conservation and environmental objectives. These methods include choice modelling (CM), travel cost method (TCM), hedonic pricing method (HPM), benefit transfer method (BTM), experimental

auctions, discrete choice experiments (DCM), multi – attribute utility theory (MAUT) and contingent ranking. Each of these methodologies possesses unique advantages and constraints, and the selection of a method relies on the particular circumstances, the nature of the conservation endeavour, and the resources accessible for carrying out the investigation. Utilising several approaches can enhance the overall comprehension of the public's WTP for conservation initiatives.

CM is a popular method in marketing and transport fields, as well as in environmental applications that mainly focus on usage values and is often utilized along with other non – market valuation methods to obtain more information regarding individuals' preferences. CM has the capacity to offer significantly more comprehensive insights into individuals' preferences compared to CVM (Morrison & Bennett, 2000). It is sometimes referred to as Conjoint Analysis, entails presenting participants with a collection of alternative situations, each characterised by distinct features (such as the degree of conservation effort, cost, and environmental impacts). Participants select their favoured scenario from each group. Through the examination of these options, researchers can deduce the significance individuals assign to particular characteristics and their willingness to pay for modifications in these characteristics. Other non – valuation methods such as DCM and experimental auctions are also often paired with CM in order to gather individuals' preferences for specifically.

According to Armbrecht (2014), while the CVM enables a separate evaluation of the core experience (of cultural or environmental) from other experiences of visiting a place, the TCM is restricted to an overall assessment. Therefore, the TCM is not a suitable indicator of the value of core experiences when the overall experience encompasses multiple other experiences and should be paired with other non – market valuation methods. If travellers are seeking a single core experience, TCM may be suitable due to its practicality and cost – effectiveness. However, it may be difficult to disentangle the travel cost specifically for only one core experience, since trips often have multiple purposes.

2.2.1 Application of Contingent Valuation Method in Malaysian Environmental Studies

Despite initial criticism, the CVM technique is now widely used in health, cultural and environmental economics. Yacob, Radam and Awang (2008) emphasized that the CVM's simplicity, straightforwardness and flexibility make it widely used in environmental economics valuation as it can be used to quantify the use and non – use values of natural resources, making it one of the best techniques for valuing them. Davis (1963) was one of the first to use CVM to evaluate environmental resources by calculating hunters' and tourists' value of a wilderness location. In the 1980s, trustee government entities in the United States of America (U.S.) were given the authority to sue for natural resource damages and the Exxon Valdez was the first oil disaster in the U.S. to employ CVM to assess damage.

Since then, CVM has gained international importance in assessing environmental values or adjustments. Both the Exxon Valdez oil spill and Kakadu Conservation Zone, Australia are remarkable due to the in – depth analysis of the CVM, which incorporates a step – by – step process

and hypothetical scenarios to reflect environmental quality. Meanwhile, CVM studies in Malaysia began in the late 1980s, which is sluggish compared to other emerging countries (Yacob et al., 2009). Initially, Malaysian CVM studies focused on non – timber items such as rattan, bamboo, wildlife and medicinal plants (Yacob, Radam, Wahidin & Shuib, 2009). Since then, environmental valuing has included non – use advantages of forest products such as biodiversity conservation, leisure and tourism.

In one of the earliest CVM studies in Malaysia, Abdullah (1993) used CVM to estimate environmental values in Malaysia and found that Taman Tasik Perdana's outdoor recreational resources have a median WTP of RM36. Recent Malaysian CVM studies include air quality, marine life, wetland protection and waste management (Afroz, Hassan, Awang & Ibrahim, 2005; Yacob et al., 2009; Siew, Yacob, Radam, Adamu & Alias, 2015; Yacob, Kabir & Radam, 2015). In health and cultural economics, CVM is widely used to determine respondents' WTP for vaccination and historical preservation (Rajamoorthy et al., 2009; Chiam, 2019). Nevertheless, most economic valuation studies in Malaysia that utilizes CVM are in the field of environmental economics, while few are in others. Overall, the environmental resources valuation in Malaysia revealed high WTP values, which shows that the public highly values conserving natural resources (Yacob et al., 2009). Many CVM elicitation approaches have been developed to measure the economic worth of Malaysian environmental products and services.

In the case of Sarawak, CVM is not yet widely used to economically valuate the environmental resources. Some of the recent existing studies include economic valuation of sustainable terubok fisheries and conservation of species in protected areas (Ghanie, Marikan, Edman & Abdullah, 2019; Bakar, Marikan, Edman & Ali, 2021). According to Ghanie et al. (2019), the respondents' average willingness to accept (WTA) in order to protect the population of terubok is RM301.08. Meanwhile, Bakar et al. (2021) found that the minimum mean increase in WTP to conserve flora and fauna in KNP is 4.38% or RM0.44, while the maximum estimated mean increase is 200.24% or RM20.24. Additionally, employment status, educational achievement and income demonstrate favourable and substantial outcomes. Similar findings were also found among the non – visitors of KNP in Sarawak, Malaysia (Bakar, Marikan, Edman, Ali & Adam, 2023). These findings show that there is awareness among the Sarawak citizens to conserve environmental resources.

2.3 Matang Wildlife Centre and Semenggoh Wildlife Centre

Matang Wildlife Centre (MWC) and the Semenggoh Wildlife Centre (SWC) are the two wildlife centres that care and protect the Bornean orangutan, located in the city of Kuching, Sarawak. The main draw for visitors to Semenggoh is its wildlife centre, where endangered creatures that were once illegally held as pets are trained to fend for themselves before being reintroduced into the forest. A number of orangutans have been trained and released throughout the years, forming a feral colony in the reserve. Semenggoh Nature Reserve is home to a semi-wild orangutan colony that has been trained and is accustomed to human interaction. Figure 1 and Figure 2 below show the maps of MWC and SWC respectively.

Figure 1: Map of Matang Wildlife Centre (MWC)

Figure 2: Map of Semenggoh Wildlife Centre (SWC)

On the other hand, the MWC, which is located within the Kubah National Park (KNP), keeps endangered wildlife in vast enclosed rainforest regions or spacious cages. The orangutan adoption programme, which teachers juvenile orangutans that have been orphaned or rescued from captivity to thrive in the wild, is the main attraction of MWC. Moreover, ecotourism projects aimed to conserve orangutans such as "Heart to Heart With Orangutans" and the "Orangutan Junior" programmes are being implemented. However, the main revenue of both of the wildlife centres comes from the entrance fees. The number of total visitors and entrance fees to MWC and SWC are provided in Table 1 and Table 2 below.

Table 1: Total Visitors in MWC and SWC

Year	MWC		SWC		Grand Total
	Domestic	Foreigner	Domestic	Foreigner	
2015	33,162	3,690	46,304	30,335	113,491
2016	35,408	4,014	48,779	34,330	122,531
2017	30,707	3,546	50,182	37,881	122,316
2018	32,438	4,434	45,983	43,255	126,110
2019	25,463	4,909	46,306	49,691	126,369

Table 2: Entrance Fees to MWC and SWC

Category	MWC		SWC	
	Local (RM)	Foreigner (RM)	Local (RM)	Foreigner (RM)
Adult	10	20	5	10
Senior Citizen	5	10	3	5
Disabled Person	5	10	3	5
Children (6 - 18 years old)	3	7	2	5
Children (below 6 years old)	Free	Free	Free	Free

Source: Sarawak Forestry Corporation (SFC)

3. METHODOLOGY

3.1 Data Collection

A designed questionnaire was employed as a research tool in this study. The questionnaire designated consist of six sections: Section I (Introduction), Section II (Problems Facing the Country), Section III (Attitudinal & Perception Questions), Section IV (Attitude Toward Conservation & Knowledge of Bornean Orangutans), Section V (Contingent Valuation Questions) and Section VI (Background Information). Respondents are invited to complete the questionnaire based on their own personal perceptions, perspectives and opinions. The general population of citizens in Malaysia is the source of data analysed in this study. Data collection for the study was conducted within 6 weeks, from May to July of 2022. The questionnaire surveys were undertaken online instead of face-to-face interviews. The questionnaires were distributed by trained enumerators to the residents in the vicinity of the wildlife centres and in the city of Kuching, Sarawak.

According to Mitchell and Carson (1989), the wide range in WTP answers demands large sample sizes (200 to 2500) for the CVM in order to achieve an adequate level of precision in sample statistics. There are sample sizes for various combinations of relative error (V), confidence levels

$(1-\alpha)$ and the difference between genuine WTP ($\overline{TWTP}$) and calculated WTP ($\overline{RWTP}$) that a researcher is prepared to tolerate (Δ).

$$n = [\frac{t \times V}{\Delta}]^2$$

As suggested, with a V of 2.0, Δ of 0.18, and a two – sided 90% $(1-\alpha)$ confidence interval ($t = 1.96$), a sample size of 474 useable WTP quantities would be adequate. Hence, this study proposes a total sample size of 600 respondents, with the answers coming from non – visitor sample from MWC and SWC. It is imperative to study non – visitors' WTP along with visitors as they are considered as possible future visitors of the wildlife centres.

3.2 Validity and Reliability

To evaluate the validity and reliability of the CVM employed in this research, various essential measures were implemented to guarantee strong and trustworthy outcomes. In order to improve the accuracy of the results, the survey instrument was meticulously crafted to include unambiguous and realistic scenarios that closely mirror the conservation efforts in question, for which respondents were asked to indicate their WTP. Preliminary testing and pilot surveys were carried out to detect and correct any uncertainties or prejudices in the questions. In order to guarantee reliability, the survey was conducted on a sample of the target population that accurately represents the whole, and uniform techniques were utilized throughout all stages of data collecting. Besides that, statistical tests, such as Cronbach's alpha, were used to assess the internal consistency of the data, while test-retest reliability checks were conducted to confirm that the responses remained constant over time.

3.3 Data Analysis

The data analysis for the CVM in this study was performed using a systematic manner to obtain complete insights into non – visitors' WTP for conservation of Bornean orangutan reasons. Likert scale is employed to measure the extent to which respondents agreed with different statements regarding the significance of conservation efforts and the advantages they perceived. The respondents were asked to assess each statement on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). The average score for each statement was then calculated to ascertain the general levels of sentiment and agreement among the respondents. Subsequently, the non – visitors' WTP is assessed by analyzing their answers to a sequence of hypothetical bid prices. These prices were set at an increment of 20%, 40%, 60% and 80% of the entrance fees to MWC and SWC. Respondents expressed their willingness to pay the specified amount for each bid price. The likelihood of willingness to pay (WTP) at each bid price was subsequently computed by determining the proportion of respondents who agreed to the bid. Table 3 presents the proposed entrance fees to MWC and SWC according to the bid prices.

Table 3: Proposed Entrance Fees to MWC and SWC

Bid Prices	Proposed Entrance Fees			
	MWC		SWC	
	Local (RM)	Foreigner (RM)	Local (RM)	Foreigner (RM)
20%	12	24	6	12
40%	14	28	7	14
60%	16	32	8	16
80%	18	36	9	18

4. FINDINGS & DISCUSSION

4.1 Sociodemographic Characteristics

The overall description of all respondents is tabulated in Table 1 below. The respondents are heavily represented by the female gender group, with 62.7% and 37.3% of them are female and male respectively. During the data collection, enumerators were instructed to recruit working respondents whom are over the age of 18 years and receive monthly income. Furthermore, enumerators were also informed to ensure that only 10% of the survey should be conducted with individuals with no fixed monthly wage, not working or earning money from part-time jobs at home, such as sewing or babysitting. As a result, only 7% of the respondents are either unemployed, working part time or still studying while 0.33% are retired veterans. 92.67% of the respondents are either self – employed, working part – time or working full – time and earning monthly wages during the survey was conducted.

Age is a categorical variable in the sample. This survey uses six different age groups that apply to anyone who are 18 years old or older. As there were no responses among respondents under the age of 18, the findings of this study are only applicable to adults above the age of 18. The majority of the respondents is represented by the age group of '18 to 25 years old' (44.3%) followed by the age group '26 to 35 years old' (28%). The age groups ’36 to 45 years old’, ’46 to 55 years old’ and ’56 to 64 years old’ were represented by 12.3%, 12% and 3.3% of the respondents respectively. There are no respondents above the age of 65 years old. The bulk of those who willingly volunteered to participate in the study are in their twenties and early thirties. The older age group of late thirties to sixties, on the other hand, was more likely to refuse to participate or exhibit no interest in taking part in the study.

More than half (71%) of the respondents were Malays, followed by Bumiputera (14.8%) and Chinese (11.5%). Non - Bumiputera respondents make up the least portion of those who were willing to participate in the study, which is only 2.7%. In the variable for education, the respondents' highest level of formal education is recorded. All respondents verified that they had at least completed secondary education, with the majority of the respondents had attained undergraduate degree (67.8%) and postgraduate degree (20.2%). Only 12% of the respondents

have either ended their educational attainment at secondary school or are currently pursuing their undergraduate degree.

Lastly, the questionnaire used four income categories to represent total monthly income: 'low' for total income under RM3,000, 'medium' for total income between RM3,001 to RM6,000, 'high' for total income between RM6,001 to RM9,000 and 'very high' for total income above RM9,001. The majority of the respondents earn low income (48%), followed by medium income (40.83%). More specifically, this finding indicates that the mean and median income of the respondents in this study are RM3,376.82 and RM3,000 respectively. The complete socioeconomic profile for the total sample is represented in Table 4 as follows:

Table 4: Socioeconomic Profile for Total Sample

Variable		Total (N=600)	
		Frequency	**(%)**
Gender	Male	224	37.3
	Female	376	62.7
Age group	18 - 25 years old	266	44.3
	26 - 35 years old	168	28
	36 - 45 years old	74	12.3
	46 - 55 years old	72	12
	56 - 64 years old	20	3.3
	More than 65 years old	0	0
Ethnicity	Malay	426	71
	Chinese	69	11.5
	Bumiputera	89	14.8
	Non - Bumiputera	16	2.7
Education level	Did not go to school	0	0
	Primary school	0	0
	Secondary school	72	12
	Undergraduate degree	407	67.8
	Postgraduate degree	121	20.2
Work status	Employed	556	92.67
	Not working	29	4.83
	Retired	2	0.33
	Other (Students)	20	3.33
Income	< RM3,000 (Low)	288	48
	RM3,000 - RM6,000 (Medium)	245	40.83
	RM6,001 - RM9,000 (High)	61	10.17
	> RM9,000 (Very high)	6	1

4.2 Attitudinal Information Towards Conservation of Bornean Orangutans

Table 5 shows the proportion and weighted mean for conservation of Bornean orangutans in MWC and SWC. Over 80% of respondents agreed with 6 out of 9 statements (a, b, c, f, g and i) on a scale of moderate to strong agreement. These 6 statements were strongly associated with the conservation of endangered species as well as raising funds to conserve endangered species. Besides that, 90% of the respondents voted in favour of Bornean Orangutan Conservation program and the majority of them believe that the Bornean orangutan is a special animal that needs to be protected (69.5%). These findings indicate that non – visitors of the MWC and SWC view the conservation of Bornean orangutans positively.

4.3 Respondents' WTP for Conservation of Bornean Orangutans

In a CVM study, the quantity of the bid price is regarded as the most significant variable for understanding the bid response and the replies to the bid levels serve as the foundation for this study's analysis. The payment vehicle utilized in this study is the entrance fees to MWC and SWC. In the discrete choice of CVM, the respondents were required to answer either "Yes" or "No", which are coded as "Yes = 1" and "No = 2" respectively. Table 5 indicates the likelihood of a respondent's WTP towards Bornean orangutan conservation improvements. The majority of the respondents (61.67%) replied positively, indicating that they are prepared to pay and agree with the increase in entrance fees to MWC and SWC in order to have improvements in the conservation of Bornean orangutans. Meanwhile, only 38.33% of the respondents opposed the concept of paying more entrance fees for an upgrade in Bornean orangutans conservation. These findings show that overall, the non – visitors of MWC and SWC are willing to pay more entrance fees to contribute towards the improvements for the conservation of Bornean orangutans.

Following that, Table 5 shows the respondents' WTP according to the proposed bid price levels. In the case of MWC, 20% increment results to RM12 and RM22 entrance fees for Malaysians and foreigners respectively, while 40% increment results to RM14 (Malaysians) and RM28 (foreigners), 60% increment results to RM16 (Malaysians) and RM32 (foreigners), and 80% increment results to RM18 (Malaysians) and RM36 (foreigners). Meanwhile, in the case of SWC, 20% increment results to RM6 (Malaysians) and RM12 (foreigners), 40% increment results to RM7 (Malaysians) and RM14 (foreigners), 60% increment results to RM8 (Malaysians) and RM16 (foreigners) and 80% increment results to RM9 (Malaysians) and RM18 (foreigners).

According to the Table 7, the percentages of respondents fall as bid prices rise. In other words, the rate of rejection increases as bid prices grow. It was observed that 57% of the respondents rejected the highest bid price, which is 80% of the current entrance fee increment, and that only 43% of them were willing to pay the offered price for the improvement in the conservation of Bornean orangutans in MWC and SWC. In contrast, only 25.6% of the respondents rejected the lowest level of bid price, which is 20% increment of the current entrance fees, while 74.4% of them accepted it. These findings show that the non – visitors of MWC and SWC are only willing to pay for 20% or 40% increment of entrance fees. Moreover, the questionnaire included an open – ended (OE) question to obtain the respondents' maximum WTP to contribute to the conservation of Bornean orangutans for them to receive better treatment, food supply and habitat. It is found that the mean value of maximum WTP of the respondents is RM206.98.

Table 5: Respondents Attitude to Conservation of Endangered Species

No.	Statement	% of Respondents		Mean
		MA	SA	
a	The government should raise more funds to deal with environmental programs in this country.	37.5	56	4.45
b	Endangered species are important even if I don't get to see them.	25.7	71.5	4.66
c	We should provide better habitats for the endangered species.	29.5	67.2	4.62
d	Endangered species conservation should not be a high priority concern of the government.	9.5	5.2	1.98
e	There are more important environmental concerns than endangered species conservation.	24.5	4.8	2.76
f	Poaching of wildlife species should be punishable by law.	19.7	77.5	4.72
g	It is everyone's duty to ensure that plants and animals as we know them today will exist for mankind in the future.	23.2	73.5	4.67
h	The government should raise taxes to pay for more endangered species protection.	25.8	17.2	3.25
i	Citizens should contribute to endangered species conservation by making cash donations to this cause.	50.2	29.5	4.01

Note: MA and SA denote mildly agree and strongly agree respectively.

Table 6: Respondents' Responses on Probability of WTP

Response	Frequency	Percent (%)
Yes	370	61.67
No	230	38.33
Total	600	100

Table 7: Respondents' Responses to Offered Prices

		WTP		
		No (0)	**Yes (1)**	**Total**
Bid Price	**20%**	25.6%	74.4%	180
	40%	28.8%	71.2%	170
	60%	52%	48%	150
	80%	57%	43%	100
			Total	600

4.3 Recommendations

The CVM has evolved as a viable method for assessing the worth of non – market goods and services. Diversity of value categories and valuation methodologies provides a chance to evaluate the merits and shortcomings of the CVM approach as a tool for evaluating the demand for and the values of natural resources, as well as policies and programmes. In addition, the data acquired from the CVM study was derived from actual market behaviour. The information received comes from the respondents' expressed preferences. It is essential for obtaining the most accurate estimates of the values of products and services when it is reasonably simple to determine the values in discrete units. In this study, non – visitors of MWC and SWC were able to indicate the value of Bornean orangutans conservation with the support of a well – designed hypothetical market and obtaining their WTP for improvements in the attributes of the market.

According to this survey, the non – visitors of MWC and SWC are prepared to pay more than the existing entrance fees. Specifically, they are willing to pay up to 40% increment of the entrance fees. In summary, their WTP values may be used to revise the pricing regulations in MWC and SWC in order to improve the conservation of Bornean orangutans. The best pricing approach is a blend of policy objectives and visitor information. Thus, based on the findings of this study, three solutions are offered to modify the entrance fees to MWC and SWC:

i. To preserve the status quo option for both Malaysian and foreign visitors. This approach is economically unproductive and would result in a pricing regime that is inefficient. In addition, it was found in this study that both Malaysian and foreign tourists are prepared to pay greater entrance fees up to 40% increment.

ii. To retain the status quo for Malaysian visitors, while increasing the costs for overseas visitors. Utilizing this alternative will boost the revenue for MWC and SWC. However, this strategy will emphasize problems regarding discrimination that may deter visitors.
iii. Increase the entrance fees for all tourists, regardless of nationality. Clearly, this approach will maximize income, allowing for an effective pricing strategy to be implemented.

5. CONCLUSION

The preservation of endangered species is vital for the preservation of biodiversity, the well-being of ecosystems, and the overall equilibrium of nature. Bornean orangutans, an extremely endangered species, have a crucial impact on their rainforest surroundings by actively participating in forest regeneration and promoting biodiversity. Preserving these apes necessitates substantial financial resources to counteract dangers like habitat degradation and illicit hunting. Implementing new measures, such as modifying access costs at conservation areas, can help secure the required money. Enhanced financial backing from visitors, as demonstrated by their readiness to pay elevated costs, is crucial for maintaining efficient conservation endeavours and guaranteeing the survival of Bornean orangutans.

Securing independent funding is crucial for national parks due to various reasons. Dependence on government support can result in financial instability caused by shifts in political objectives, reductions in budget allocations, or economic downturns, all of which can undermine ongoing conservation initiatives. National parks can provide reliable and enduring income for their programmes and maintenance requirements by generating their own revenue. Obtaining external money can help improve the quality of visitor services and infrastructure, so enhancing the parks' appeal and enjoyment for visitors. This include enhanced amenities, meticulously maintained pathways, and an expanded array of educational and recreational initiatives. Moreover, when parks are able to cover their own expenses, they may allocate their earnings towards conservation initiatives and community engagement, thereby augmenting their significance for both wildlife and individuals.

Visitors may experience a minor increase in entrance fees or payments for specific services as a result of parks generating their own revenue. Nevertheless, these expenses are frequently seen reasonable due to the enhanced encounter and the awareness that their contributions directly bolster conservation endeavours. This can result in a more involved and encouraging group of visitors, cultivating a feeling of collective accountability for conserving natural resources. In general, the provision of autonomous finance can result in a more robust and efficient approach to conservation, which in turn benefits both the natural environment and visitors to the park.

This study emphasises the effectiveness of the CVM in measuring public support and WTP for the conservation of Bornean orangutans. The CVM is a recognised and efficient approach for assessing the worth of commodities and services that do not have a market value. By leveraging respondents' expressed preferences, it enables the evaluation of the demand for natural resources and the efficacy of associated policies. The results suggest that those who have not visited MWC and SWC

are more inclined to pay higher admission fees, with a potential increase of up to 40%, in order to contribute to conservation initiatives. These observations highlight the possibility of modifying existing pricing techniques to increase revenue for conservation without discouraging visitors.

The augmented cash can be utilised to directly bolster conservation initiatives, restore habitats, combat poaching, and enhance the general management of the parks, so guaranteeing the safeguarding of endangered species such as the Bornean orangutan. By applying the recommended pricing solutions, national parks can enhance their financial stability and achieve independence from the volatility of government budgets. Financial independence guarantees a stable and dependable source of finance, enabling long-term strategic planning and continued conservation initiatives without being susceptible to political or economic fluctuations. The parks will also have the opportunity to upgrade facilities, infrastructure, and educational programmes, so enhancing the entire experience for visitors. Lastly, this study offers empirical data on the inclination of visitors to pay, enabling policymakers to make well-informed decisions grounded in real market behaviour and preferences. Adopting this strategy based on evidence can result in policy improvements that are more efficient and widely embraced. To summarise, the study's results and pricing recommendations provide a strategic approach to enhance conservation efforts, guarantee financial sustainability for national parks, and enhance the overall tourist experience, while still upholding fairness and accessibility.

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