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Assessing Visitor Preferences for Ecotourism and Wildlife Management in Tropical Wildlife Centres: A Choice Experiment Approach

Abstract

Wildlife tourism has become an important mechanism for financing biodiversity conservation, yet limited empirical evidence exists on how visitor preferences can be translated into effective conservation funding, particularly for endangered species such as the Bornean orangutan. This study addresses this gap by economically valuing conservation-related attributes at two key orangutan conservation sites in Malaysia, which are Matang Wildlife Centre (MWC) and Semenggoh Wildlife Centre (SWC). The primary research objective is to estimate visitors' willingness to pay (WTP) for conservation-oriented improvements that support Bornean orangutan conservation at these wildlife centres. A choice experiment (CE) was conducted using survey data from 352 visitors to elicit preferences and marginal WTP for key site attributes, including amenities, information availability, park guide services, and hedonistic experience. Entrance fee charges were used as payment vehicle in this study. Results indicate that visitors generally prefer intermediate levels of amenities (AMT2) and information availability (INFO2), with diminishing marginal returns at higher levels. Park guide availability emerged as a particularly valued attribute, with respondents demonstrating a willingness to pay higher entrance fees for enhanced guided services. Preference heterogeneity was evident across socioeconomic groups, with age, income, and gender significantly influencing attribute preferences. Overall, the findings suggest that strategically designed service enhancements and differentiated pricing structures can enhance visitor satisfaction while generating sustainable revenue for conservation. This study demonstrates the usefulness of discrete choice experiments as a decision-support tool and highlights the potential for wildlife tourism to contribute meaningfully to the long-term conservation of Bornean orangutans.

Keywords: Matang Wildlife Centre, Semenggoh Wildlife Centre, Choice Experiment, Ecotourism & Management, Choice Modelling

1.0 Introduction

Ecotourism plays a critical role in achieving sustainable development by balancing environmental conservation with economic benefits. Protected areas serve as keystones for ecological functioning and the provision of ecosystem services, and their preservation is central to national and international conservation policies (Dudley, 2008). In the context of tropical forests, one of the most iconic and ecologically important species is the orangutan.

The decline in orangutan populations has significant environmental consequences. Orangutans are known as "gardeners of the forest" due to their critical role in seed dispersal, which helps maintain forest composition, regeneration, and biodiversity. Their disappearance disrupts these ecological processes, potentially leading to the loss of plant species and long-term ecosystem instability. Moreover, orangutan habitats are home to other endangered species such as the Sumatran tiger, Asian elephant, and rhinoceros. The degradation or loss of these habitats threatens broader biodiversity, underscoring the importance of conserving orangutans not only for their own sake but also for the survival of other species and the stability of entire ecosystems.

Recognizing this, ecotourism development that emphasizes orangutan conservation can serve as a dual-purpose strategy: generating sustainable revenue and promoting environmental stewardship. In Sarawak, Malaysia, two prominent ecotourism destinations – Semenggoh Wildlife Centre (SWC) and Matang Wildlife Centre (MWC) – are widely recognized for their efforts in conserving the critically endangered Bornean orangutans. These centres not only function as wildlife sanctuaries but also serve as major tourism attractions that highlight the synergy between conservation and recreational activities.

The SWC, located within the Semenggoh Nature Reserve, is known for its semi-wild orangutan population, many of which were previously kept as illegal pets and have since been trained to survive in the wild. Similarly, the MWC, situated within Kubah National Park (KNP), houses endangered species in both natural and semi-natural enclosures and runs programs such as "Heart to Heart With Orangutans" and "Orangutan Junior" that promote environmental awareness and conservation. These centres attract a significant number of both domestic and international visitors annually, as reflected in Table 1, which shows total visitor numbers to MWC and SWC from 2015 to 2019. While these facilities generate income primarily through visitor entrance fees (Table 2), increasing tourist inflows and rising expectations for service quality highlight the need for upgraded ecotourism infrastructure and improved conservation management.

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)

Despite the vital ecological and educational roles of these centres, limited financial resources constrain their ability to improve services and enhance conservation outcomes. This underscores the importance of understanding tourists' preferences and willingness to pay (WTP) for improved ecotourism services and management. In particular, assessing whether tourists are willing to accept higher entrance fees in exchange for improved services offers insights into sustainable financing strategies for protected areas. Revenues from increased fees can be used not only to upgrade facilities and enrich visitor experiences, but also to support conservation programs such as habitat restoration, wildlife research, and species protection. This approach aligns ecotourism with environmental stewardship by linking visitor satisfaction with long-term conservation financing.

Economic valuation frameworks such as the Total Economic Value (TEV) concept offer a comprehensive perspective for assessing the full range of benefits derived from environmental resources. TEV includes both use and non-use values. Use values, which include direct, indirect, and option values, reflect the tangible and intangible benefits from direct interaction with nature, such as eco-recreational services and environmental protection (Pearce & Moran, 1994; Fausold & Lilieholm, 1996; Munasinghe, 1993). Non-use values, encompassing existence and bequest values, reflect the intrinsic value individuals assign to conserving biodiversity for current and future generations, even without direct usage (Bishop, 1978; Klemperer, 1996; Nunes, 2002).

To empirically assess tourist preferences and WTP, this study adopts the choice experiment (CE) method, a stated preference technique originating from conjoint analysis (Louviere & Hensher, 1982; Louviere & Woodworth, 1983). The CE method allows researchers to evaluate trade-offs made by respondents when presented with hypothetical scenarios containing varied ecotourism service attributes. In Malaysia, CE applications remain relatively limited but have shown growing potential. Past CE studies include Othman (2007) on mangrove management in Perak; Muhamad, Radam, and Yacob (2014) on tourist satisfaction in Kenyir Lake; and Asri and Musa (2021) on attitudes toward mangrove conservation in Langkawi. CE has also been utilized for benefit transfer applications (Hasan–Basri & Karim, 2016), making it a robust tool for ecotourism valuation.

More recently, the choice experiment on Malayan tiger conservation demonstrated that visitors to Taman Negara National Park placed greater value on increases in the tiger population than on other attributes, such as prey abundance or ranger staffing levels (Mzeq, Samdin & W.

Mohamad, 2022). Similarly, contingent valuation studies conducted in 2023 and 2024 found that visitors were willing to pay higher entrance fees to support biodiversity conservation at the Kuala Lumpur Forest Eco Park and Gunung Mulu National Park, respectively (Musa & Shahrudin, 2023; Ibrahim et al., 2024).

Across a range of valuation studies, public preferences consistently favoured broader environmental and ecosystem benefits over narrowly defined conservation targets. Respondents demonstrated a strong preference for megafauna, such as beluga whales and woodland caribou, with WTP estimates substantially higher for megafauna-focused programs (approximately $160 per year) than for initiatives targeting birds, insects, or fish (around $12 per year), while multispecies approaches attracted broader support than single-species strategies (Lévesque, Gagné & Dupras, 2022). In parallel, individuals were willing to pay an average of €128 annually for enhanced ecosystem services, including improved water quality and recreational opportunities, although WTP varied spatially within the watershed (Hernandez & Costa, 2022). Similarly, evidence from the United Kingdom indicates robust public WTP for reducing health risks from lead and for improving overall environmental quality, with these attributes eliciting more prominent and consistent values than increases in bird populations alone (Brock et al., 2024).

Given the increasing relevance of sustainable financing mechanisms for conservation, this study seeks to fill an empirical gap by focusing on the WTP for improved ecotourism services and management at SWC and MWC, particularly through entrance fee adjustments. Specifically, the objectives of this study are twofold: (i) to examine tourists' preferences for various enhancements in ecotourism service delivery and conservation efforts at these two centres, and (ii) to assess their willingness to financially support such improvements through revised entrance fees.

The contributions of this study are threefold. First, it advances the understanding of tourist preferences within the context of wildlife-based ecotourism in Malaysia—a relatively under-researched area. Second, it applies a robust CE methodology to quantify trade-offs and derive policy-relevant WTP estimates. Third, the findings are expected to inform policymakers and park management authorities in designing targeted ecotourism strategies that align financial sustainability with conservation outcomes. Ultimately, this research enhances the integration of tourism economics, environmental valuation, and sustainable development in protected area management.

The remainder of this paper is organized as follows: The next section presents the methodology**,** detailing the choice experiment design and data collection procedures. This is followed by the empirical results section, which reports and interprets the findings from the analysis. The final section offers the conclusion and policy implications**,** highlighting actionable insights for ecotourism and conservation management in Sarawak.

2.0 Methodology

Model Specification

This study utilizes the choice experiment method, as it is optimal for analyzing trade-offs among various traits and for determining marginal willingness to pay within the TEV framework. According to Hanley *et al.* (2001), a typical CM design consists of six stages, which begin with choosing specific features or attributes to enhance or preserve, followed by determining the

levels of these attributes, selecting an experimental design, creating choice sets, measuring preferences and identifying the estimation technique. On the other hand, Rolfe *et al.* (2004) suggest that CM research should be identified in three stages, which are policy concerns, framing issues and statistical challenges. The policy stage focuses on core problems and organization of the study, while the framing phase focuses on how respondents can be presented with critical trade – offs. The final stage emphasizes predicting decision structures and building an iterative experimental design approach. The design process is iterative due to interdependencies across phases, making it a flexible approach.

The theoretical foundation of CE is complex, as it combines various economic ideas. Yacob *et al.* (2008) state that CE aligns with Lancaster's economic theory of value and neoclassical economics, as it is founded on the random utility theory (RUT), which is a decision theory based on probabilities. The Lancaster theory defines the value of a good or service as a function of its traits, while the RUT facilitates the estimation of the unknown true utility function. The conditional logit, also known as McFadden's logit, is typically used to estimate the CM method. To illustrate, supposed a respondent *i* is presented with *k* amount of alternatives in a choice set, where the levels of attributes are characterized by 'low, medium and high' and *n* is the vector of . The probability of respondent *i* choosing alternative *j* is influenced by the observable characteristics of option *j* compared to the other available choices. In this study, there are three accessible options: Option 1, Option 2 and the status quo. Therefore, the probability of receiving a response is depicted as follows:

(1)

Where is the probability of respondent *i* choosing option *j*, is a vector that reflects the observable qualities of alternative *j* provided to respondent *i*, whereas is a vector that provides the observable attributes of alternatives *k* supplied to respondent *i*. Furthermore, the *f* function is available for use with an anticipated vector of preference parameter values, . Calculating the marginal value of each conservation attribute in the respondent's set of options can be utilized to calculate the parameters.

To obtain a CE model or a specific function *f* in Equation (1) above, the utility acquired by the respondent from each alternative is analysed. Let be the vector that represents all the attributes of alternative *j* as perceived by respondent *i*. Based on Lancaster (1966), the level of utility that respondent *i* derives from alternative *j*, referred to as can be expressed as:

(2)

According to the utility hypothesis, individuals tend to choose the alternative that maximizes their overall satisfaction or benefit. The model representing the behaviour of respondent *i* in choosing option *j* is given by , where . Hence, the respondent *i*'s utility can be written as:

(3)

The known utility of the respondent *i* is represented by the utility function in the equation (3), which determines the deterministic component. According to the RUT principle, an individual's indirect utility function (), which is not directly observable, can be divided into two components, which are the deterministic or systematic element (V) and a stochastic component (ε) (Hanley *et al.*, 2001). The random component in the quantitative characteristics of the object or service

being evaluated represents the element of unpredictability in their preferences. Unaccounted factors in the utility function can lead to inadequate data, making ε an arbitrary term or variable of mistake. The utility function of respondent *i*, given *k* possibilities can be expressed as:

(4)

Where represents the utility that respondents *i* obtains from the collection of alternative options *j*. denotes a utility function that is predictable, while denotes a random component or error term. Equation (4) defines the deterministic component (V) as a linear function of the attributes (X) of the *j*th alternative in the collection. However, the stochastic component is represented by the unobservable influences on individual decisions (Hanley *et al.*, 2001). It can also be restated as:

(5)

Socioeconomic factors may not be considered in the decision set properties of the equation, as they are consistent across decision occasions for a given individual. Hanley *et al.* (2001) suggest that variables like household income can only be counted as interaction terms, similar to interactions with specific choice attributes. In a scenario where an individual is asked to choose between two alternatives, represented by *g* and *h*, they are asked to select the option with the most utility. The choice set is the group of choices from which a respondent chooses, and the likelihood of choosing option *g* over other options is expressed as the chance that the utility associated with option *g* is greater than with all other alternatives, such as follows:

(6)

Equation (6) illustrates that the probability of choosing option *j* over alternative *k* is determined by the disparity in utility between the deterministic components, which is greater than the disparity between the random or error elements. In order to derive a precise mathematical representation for this equation, it is necessary to have knowledge about the probability distribution of the error terms, . Therefore, it is often assumed that error terms adhere to the Weibull distribution, indicating that they are distributed independently and identically (IID) with an extreme – value distribution.

(7)

The given equation (7) above suggests that the likelihood of alternative *g* being selected as the most preferred option can be described using the logistic distribution (McFadden, 1974). The derivation of this logistic distribution is commonly referred to as the conditional logit model and may be expressed as follows:

(8)

The parameter μ exhibits an inverse relationship with the standard deviation of the error distribution in (8). Usually, this scale parameter cannot be recognized as a separate entity and is instead considered as a single unit. The definition of the parameter highlights the need that the error terms associated with the choice set must conform to the Independence from Irrelevance Analysis (IIA) criterion. The IIA property states that the likelihood of choosing between two options remains the same regardless of the presence or absence of other choices. The

characteristic is similar to the Weibull error terms in that they are uncorrelated across the different options in a decision set.

(9)

Assuming that varies linearly with the parameter, the functional form of the respondent's systemic component of the utility function can be expressed as:

(10)

The utility function's variables, *X*s and s, are used to calculate coefficients. The utility impact of a modification in attribute *X* is reflected in the estimation of s. Socioeconomic variables can be added to option set attributes, but they are constant across decisions for a given individual. Income is considered as interaction terms, interacting with specific choice attributes. After acquiring estimated parameters, a WTP compensating variation welfare measure conforming to demand theory can be produced for each attribute using the formula (Hanemann, 1984).

(11)

The utility of the initial state is denoted as , while the utility of the alternative state is denoted as . The coefficient of the characteristics is represented by . where as represents the coefficient on the cost attributes, which measures the marginal utility of income. The linear utility index in equation (5) can be simplified to the ratio of coefficients. The WTP value for a marginal change in an attribute is commonly determined by dividing the value of each non – monetary attribute by the monetary attribute, . According to Hanley and Barbier (2010), these factors are commonly known as implicit pricing or marginal rate of substitution (MRS). The ratio of an attribute's price coefficients to its own price coefficients is the marginal implicit price of the attribute, as follows:

(12)

Equation (12) indicates the change in implicit price of qualities relative to the existing situation or status quo alternative. The utility maximization and demand theory are consistent with the CE exercise if the status quo option is included in the list of options. To establish welfare measurements that agree with the demand theory, a status quo option must be included in the set of alternatives. If respondents are not given the opportunity to maintain the status quo, they are compelled to select one of the suggested options, which they may not want at all.

Hanley *et al.* (2001) noted that if the most preferred alternative is the existing baseline state, any model based on a design in which the baseline is absent will provide erroneous estimates of consumer welfare. Determining standard errors for implicit pricing ratios is more challenging and complex due to the non – linear function of the parameter vector. If a breach of the IIA hypothesis is discovered in a CE study, more advanced statistical analysis models are necessary to loosen some underlying assumptions. These models include multinomial probit, nested logit and random parameters logit models.

With respect to the first objective, which aims to investigate visitors' preferences for improvements in ecotourism service delivery and conservation-related experiences, the CE model includes a range of non-monetary attributes: amenities, information accessibility, availability of park guides, and hedonistic experiences. Meanwhile, pertaining the second

objective, which seeks to evaluate tourists' readiness to financially endorse enhancements in ecotourism services and conservation initiatives, the entrance fee charge is incorporated as the exclusive monetary variable in the CE model. Thus, following equation outlines the specifications of the basic conditional logit model (Model 1) employed to assess improvements in ecotourism and management attributes (EMT) for the visitors of MWC and SWC:

Where:

– Medium level of amenities
– High level of amenities
– Medium level of information availability
– High level of information availability
– High level of park guide availability
– Medium level of hedonistic experience
– High level of hedonistic experience
– 20% increase in entrance fee charges
– 40% increase in entrance fee charges
– 60% increase in entrance fee charges
– 80% increase in entrance fee charges
to – Coefficient of each of the explanatory variables
– Error term

The simple conditional logit model is further extended by incorporating visitors' socioeconomic characteristics, specifically the age of respondents (), income (), and gender (), to account for preference heterogeneity, with only statistically significant attributes retained in the model. Consequently, the following conditional logit model (Model 2) is specified:

In summary, the simple logit model (Model 1) captures visitors' average preferences towards ecotourism and management characteristics, directly fulfilling the primary purpose of assessing preferences for service and conservation improvements. The inclusion of the monetary attribute, , fulfils the second objective. The conditional logit model (Model 2), by integrating statistically relevant socioeconomic indicators, facilitates the evaluation of choice heterogeneity and offers enhanced insights into differences in willingness to pay, thus reinforcing the secondary purpose of assessing financial support. Collectively, these models provide the CE framework utilized in this study, facilitating a thorough and objective assessment of ecotourism and conservation characteristics.

Sample Size & Survey Design

The sample size for this study was calculated by considering the target population of visitors to MWC and SWC in Sarawak, Malaysia. In order to conduct a reliable and statistically significant analysis, this study employed a sample size of 352 respondents. This amount was selected to guarantee a suitable degree of accuracy and certainty in the outcomes, taking into account the wide range of visitor preferences and behaviours as well as suggestions by previous studies (Mitchell & Carson, 1989; Pearmain *et al.,* 1991). Stratified random sampling is also utilized due to the large population size and to minimize difficulties in identifying each individual in the population.

Data was collected through face – to – face interviews at both MWC and SWC, with guides given to the enumerators to ensure the most accurate WTP values were collected. Within each stratum, respondents were selected randomly, taking into account their availability and the opportunity to participate. The enumerators were also given instructions to interview the visitors once they have finished their visitation and activities to guarantee that they have firsthand witnessed and experienced the values they perceive while visiting MWC and SWC. Every respondent received clear information about the objective of the study and were provided with guidance throughout the survey to ensure its completion. In the start of each interview session, participants were briefed on the objective of the survey, which aimed to assess their WTP for enhancements in the quality of ecotourism and management (EMT) features offered in the park.

Additionally, they were notified that their feedback has the potential to enhance the formulation of policies and decision-making processes concerning the park in the future. In addition, the survey was conducted in both Malay and English in order to minimize language barriers. A pilot test was conducted in the first week of October 2023, before the formal field survey took place in the following weeks. Conducting a pilot test is crucial to identify and address any possible problems in creating the final set of questionnaires. 30 respondents, selected in a random manner, were involved in the pilot test, to assess the suitability of the attribute levels in CE. Following that, the questionnaire was revised as needed. It was segmented into several sections, including an introduction and study background, attitudinal information of the respondents, questions related to visitors' preferences and the choice experiment, and inquiries about the respondents' background information.

Choice of Experimental Design

This study has established a set of multiple choices to assist respondents in selecting their desired features and levels for SWC and MWC. The available alternatives for ecotourism and management attributes (EMT) differ depending on the choice sets supplied. Every choice set consists of three components: attributes, alternatives and their corresponding levels (determined by their attribute). These decision sets comprise of three management options, including the status quo option. A status quo choice signifies that the respondents choose to maintain the current situation if they do not expect any modifications or enhancements to the existing management alternatives.

An experimental design is usually orthogonal, ensuring that the attributes presented to participants are modified separately and that the impact of each feature on the responses can be more easily identified. Orthogonality prevents multicollinearity among the attributes. Therefore, the SPSS statistical software was utilized to enable the construction of the orthogonal design in this study. The orthogonal design comprises of both a complete factorial design (CFD) and a fractional factorial design (FFD). As the alternatives in this study are determined by the combination of three attributes with three levels, one attribute with two levels and one attribute with 5 levels, the total number of options calculated resulting in 270 possibilities included in the CFD.

Meanwhile, in the FFD, certain interactions are excluded or emphasized, with the exception of the main effects. A number of 'ineffective' options were eliminated, resulting in a total of 10 possibilities for the EMT qualities. Useless options are determined by the following assumptions: (i) If the combination of each attribute exhibits low levels but higher charges for entrance fees, and (ii) if the combination of each attribute exhibits high levels but lower charges for entrance

fees. The EMT choices are further categorized into five distinct decision sets, with each set consisting of two proposed ecotourism and management solutions, along with a status quo option. This implies that there are three distinct alternatives in a set of choices, each differing in terms of their attribute levels and costs. Option 1 and 2 demonstrate various combinations of EMT attributes, accompanied by slight modifications in the entrance fees. Option 3 represents the status quo, where there are no modifications to the EMT attributes and entrance fees. Table 3 below presents the selected EMT attributes and their levels.

Table 3: Selected Ecotourism and Management Attributes (EMT) and Levels for MWC and SWC

Attributes	Attribute Levels	Current State
Amenities	Low (AMT1)	
	Medium (AMT2)	Low
	High (AMT3)	
Information availability	Low (AMT1)	
	Medium (AMT2)	Low
	High (AMT3)	
Park guide availability	Basic (PG1)	Basic
	High (PG2)	
Hedonistic experience	Low (HE1)	
	Medium (HE2)	Low
	High (HE3)	
Entrance fee charges	No change (MPRICE1)	
	Increase by 20% (MPRICE2)	
	Increase by 40% (MPRICE3)	No change
	Increase by 60% (MPRICE4)	
	Increase by 80% (MPRICE5)	

3.0 Empirical Results

Socioeconomic Characteristics

The study examines the socioeconomic characteristics of the 352 participants to provide a thorough insight of the visitor demographics at MWC and SWC. Understanding the preferences connected to ecotourism and management attributes relies heavily on the distribution of these features when evaluating the findings of the choice experiment. Table 4 shows the socioeconomic profile of the respondents who participated in this study. The sample consists of 167 male respondents, accounting for 47.44% of the total, and 185 female respondents, making up 52.56% of the total. This equal gender representation guarantees that the collected preferences accurately reflect the preferences of both male and female visitors.

The majority of responses belong to the age range of 26 to 35 years (38.92%). This demographic constitutes a substantial proportion of the ecotourism industry, followed by the younger age group of 18 to 25 years old (30.11%). Significantly, there were no participants who were 65 years old or older, suggesting that the majority of the visitors are from a relatively younger age group. In the aspect of ethnic composition, the respondents exhibit a varied ethnic mix. The percentage of Malay individuals is 32.67%, followed by percentage of other Bumiputera (31.53%) and 26.14% Chinese respondents. The distribution of visitors emphasizes the multicultural composition, with Malays being the most populous group, closely followed by other Bumiputera communities and Chinese.

Moreover, all participants said that they had completed at least a secondary education, and a notable percentage (46.02%) had obtained an undergraduate degree. The visitors' high level of

educational attainment implies that they are generally well – educated, which could impact their choices and awareness about ecotourism and conservation activities. All participants are currently employed, which accurately represents the economic activity and employment status of the visitor demography. The income levels are classified into the following categories: median income (52.27%), low income (42.05%) and high income (5.68%). Merely a minuscule proportion (0.85%) of participants receive a monthly income over RM9,000. The presence of a significant number of individuals in the medium income category suggests that the visiting demography is predominantly middle-class. This has consequences for their capacity to spend and their willingness to contribute financially towards conservation initiatives.

Local residents constitute the majority of the respondents, accounting for 78.69% of the total, while non-Malaysians make up the remaining 21.31%. The distribution of visitors to the wildlife centres suggests that although they do draw international tourists, their main focus is on serving the local community. In general, the socioeconomic attributes of the sample indicate a largely young, highly educated, and mostly local group of visitors with intermediate income levels. The demographic profile offers important information for understanding the preferences and attitudes towards ecotourism and conservation projects in the study.

Table 4: Socioeconomics Profile for Overall Sample

Variable		Visitors (n = 352)	
		Frequency	%
Gender	Male	167	47.44
	Female	185	52.56
Age group	18 – 25 years old	106	30.11
	26 – 35 years old	137	38.92
	36 – 45 years old	59	16.76
	46 – 55 years old	30	8.52
	56 – 65 years old	20	5.68
	More than 65 years old	0	0
0Ethnicity	Malay	115	32.67
	Chinese	92	26.14
	Other Bumiputera	111	31.53
	Non – Bumiputera	34	9.66
Education level	Did not go to school	0	0
	Primary school	0	0
	Secondary school	23	6.53
	Diploma	77	21.88
	Certificate of Excellence	45	12.78
	Undergraduate degree	162	46.02
	Master's degree	36	10.23
	PhD	9	2.56
Working status	Employed	352	100
	Not working or seeking for work	0	0
	Retired	0	0
	Others	0	0
Total monthly income	< RM3,000 (Low)	148	42.05
	RM3,000 – RM6,000 (Medium)	184	52.27
	RM6,001 – RM9,000 (High)	17	4.83
	> RM9,000	3	0.85
Nationality	Local (Malaysian)	277	78.69
	Foreigner	75	21.31

Choice Experiment Results

Table 5 shows the results of Model 1 (simple model) and Model 2 (interaction model) of the conditional logit models. This study discusses the factors influencing visitors' selection of EMT features. The table also included the coefficient for the monetary attribute of EMT services, which was marked as MPRICE. The joint significance of the variables was tested using a likelihood ratio test, which yielded a result of 915.47 at a significance level of 1% from the visitors' simple model. These findings invalidate the null hypothesis that the marginal effects are collectively equal zero.
To enhance the precision of the simple model, the specification was augmented by include the socioeconomic characteristics of the respondents. Rolfe *et al.* (2004) proposed that incorporating socioeconomic data is not only straightforward but also crucial in developing a more accurate decision model. Furthermore, with the choices of alternatives 1, 2, or 3, participants were also presented with similar socioeconomic inquiries for each of the choice questions. Therefore, this study employed a 'generic to specific' method to provide a thorough estimation. The decision was made to eliminate the insignificant variables for future model estimate, until the EMT interaction models included only significant variables in the final model. However, the main EMT features were preserved until the conclusion.

To further analyse the data for the management CLGT models, the overall goodness-of-fit was assessed. The adequacy of fit of the simple EMT model can be assessed using McFadden's (1974) statistics. Pseudo statistics have a range of values between 0 and 1, but they never actually reach or approach either of these extremes due to the way they are calculated. In addition, a Pseudo value ranging from 0.2 to 0.4 might be considered as a highly accurate model fit, as stated by Louviere *et al.* (2000). According to the summary statistics shown in Table 5, it indicates that the independent variable power has a very low level of Pseudo – R^2 values of 0.08029 (Model 1) and 0.08962 (Model 2). However, both values recognize that the model is a good fit for the data.

The outcomes of the simple model demonstrate that all coefficients are statistically significant at the 1% level, except for AMT2. The significant statistical results indicate that the variables in the model have a strong and reliable link with the dependent variable. Notably, the coefficients for all of the attributes except for INFO exhibit an upward trend as the attribute's level increases. This pattern underscores the importance of the attributes in shaping visitor preferences in the context of ecotourism and conservation efforts. Curiously, whereas the majority of coefficients exhibit an increase in relation to the level of their corresponding qualities, the INFO attribute deviates from this trend for both models. This indicates that offering an intermediate level of information (INFO2) has a more pronounced beneficial influence on visitor preferences in comparison to a higher level of information (INFO3). This discrepancy suggests that there is an optimal amount of information that, once reached, further information may not greatly improve the experience or preferences of visitors.

On the other hand, the interaction conditional logit model (Model 2) reveals that five variables, when interacting with socioeconomic characteristics, exhibit statistical significance. This provides valuable insights into the impact of these interactions on visitor preferences. The variable AMT2_AGE exhibits a positive relationship, suggesting that as visitors' age increases, their preference for the second level of the amenities attribute (AMT2) likewise increases. This implies that older visitors are more inclined to prefer scenarios that involve the particular amount of resources or financial contributions represented by AMT2. Meanwhile, the variable INFO3_INC shows that the correlation between income and choice for INFO3 is positive,

indicating that visitors with higher incomes tend to have a greater preference for the highest level of information (INFO3).

Therefore, it can be inferred that those with more wealth place a greater importance on acquiring detailed knowledge, possibly due to their ability to dedicate more resources towards comprehending and participating in ecotourism and conservation initiatives. The variable HE2_INC is also positively correlated with the largest coefficient value. Likewise, this favourable correlation suggests that visitors with higher incomes have a stronger inclination towards the second level of hedonistic experience (HE2). This implies that those with higher financial means are more likely to actively search for and value somewhat pleasing or joyful experiences when they are visiting.

Conversely, HE2_GEN demonstrates a negative correlation, indicating that female visitors exhibit a lesser inclination towards the second level of hedonistic experience in comparison to male visitors. This suggests that there may be variations in how individuals perceive or value good events based on their gender, with males perhaps placing a higher importance on these experiences. PG2_INC also has inverse correlation, suggesting that visitors with higher income are less inclined to favour the second level of park guide availability. This implies that affluent tourists may not see the same amount of importance in having park guides at a high level, or they may have a preference for self – guided tours. These findings emphasize the significance of taking socioeconomic considerations into account when assessing visitor preferences for ecotourism and conservation features. Gaining insight into these interactions can assist in customizing strategies to accommodate the varied requirements and preferences of distinct visitor segments, thereby improving the efficiency and attractiveness of conservation projects.

Table 5: Results for Simple and Interaction Conditional Logit Models

Variables	**Conditional Logit**			
	Model 1		**Model 2**	
	Coefficient	**t – value**	**Coefficient**	**t – value**
AMT2	0.6334	3.174**	0.6085	3.132**
AMT3	1.0654	4.531***	0.7891	2.940**
INFO2	2.0054	7.128***	1.9849	7.049***
INFO3	1.0492	8.659***	0.6485	3.264**
PG2	1.9703	12.739***	2.3687	11.932***
HE2	1.2503	7.648***	0.9044	3.601**
HE3	2.2372	7.123***	2.2542	7.170***
MPRICE	-0.0257	-4.567***	-0.0258	-4.591***
AMT3_AGE			0.1243	2.080**
HE2_GEN			-0.2678	-1.726*
INFO3_INC			0.0001	2.521**
PG2_INC			-0.0001	-3.143**
HE2_INC			0.0001	2.759**
Summary Statistics	1760			1760
Number of observations	-1308.551			-1295.284
Log Likelihood	-1422.788			-1422.788
Log Likelihood, No coefficients	0.08029			0.08962
Pseudo R^2	0.07820			0.08624
Adjusted Pseudo R^2				

Note: ***, ** and * signify significance levels at 1%, 5% and 10% respectively

Estimations using a conditional logit model enable the computation of the marginal rate of substitution (MRS). The Marginal Rate of Substitution (MRS) can be determined by analysing

the estimated coefficients for all attributes. This MRS is then used to assess the impact of attribute changes on respondents' WTP for entrance or conservation fees. The goal is to achieve improvements in EMT while keeping utility levels constant. Participants are required to indicate the level of trade-off they are willing to make in order to demonstrate their WTP for a price rise associated with various enhancement ideas for EMT qualities in MWC and SWC. The marginal implicit pricing of the EMT attributes can be determined by dividing the estimated coefficient of the non-monetary attributes by the monetary attribute, such as follows:

The MRS in this study refers to the percentage change in entrance fees that visitors are ready to tolerate in return for changes in the levels of the amenities attribute at MWC and SWC. The MRS values offer insights on how visitors react to changes in entrance costs compared to changes in the amenities offered at these centres. In Model 1, the MRS from AMT1 to AMT2 is 24.67%, demonstrating a willingness to embrace a 24.67% rise in entrance fees in order to transition from low to medium level amenities. Meanwhile, in Model 2, the MRS from AMT1 to AMT2 is 23.55%. Like Model 1, there is a notable inclination towards AMT2 compared to AMT1, however the preference is slightly less pronounced than in Model 1. The MRS from AMT2 to AMT3 in Model 1 and Model 2 are 16.83% and 6.99% respectively. These findings indicate that Model 2 has a significantly lower preference for AMT3 compared to AMT2.

Alongside that, respondents demonstrate a high preference for the additional information offered at INFO2 by being willing to accept a significant 78.11% (Model 1) or 76.82% (Model 2) increase in entrance fees to shift from the low level to medium level of information availability. However, the MRS of increment level from INFO2 to INFO3 is calculated as -37.24% in Model 1 shows that the extra knowledge provided at high level of information availability is not highly regarded and may even be seen as excessive or less beneficial. The increased negative MRS value in Model 2 (-51.73%) emphasizes the lower perceived value of INFO3 in comparison to INFO2.

For the park guide availability attribute, the MRS for transition from PG1 to PG2 is 76.74% according to Model 1. This shows that respondents demonstrate a high preference for increased park guide availability, as they are willing to accept a substantial 76.74% increase in entrance fees to shift from basic to high level of the attribute. The higher marginal rate of substitution (MRS) as demonstrated in Model 2 indicates that respondents place a greater value on the increase in park guide availability. They are ready to accept a 91.69% increase in entrance prices in order to benefit from this improvement.

Furthermore, the respondents demonstrate a significant preference for more enjoyment by stating their willingness to accept a 48.70% increase in entrance fees in order to go from the first level (HE1) to the second level (HE2) of hedonistic experiences in Model 1. However, the lower MRS indicates that respondents in Model 2 (35.01%) have a relatively lower WTP for the transition from HE1 to HE2 compared to Model 1. The respondents are also open to a 38.44% rise in admission fees in order to upgrade from the medium (HE2) to the high (HE3) of hedonistic experiences. This suggests that there is still a desire for additional improvements, although it may be slightly less pronounced. Model 2 achieved an accuracy of 52.24%, showing that taking into account their socioeconomic profile, the visitors have a greater inclination towards high level of hedonistic experiences, being willing to tolerate a 52.24% rise in entrance fees to attain this enhancement.

The results of the MRS provide an indication that visitors are generally willing to pay greater entrance fees for better amenities. However, their willingness decreases as they progress to higher levels of amenities, which demonstrates a diminishing marginal value. The substantial increase in Marginal Rate of Substitution (MRS) from AMT1 to AMT2 in both models highlights a noteworthy enhancement in visitor happiness when transitioning to the second tier of amenities. Conversely, the diminished MRS from AMT2 to AMT3 in Model 2 suggests that additional upgrades beyond the second level are deemed less valuable. Visitors also highly prioritize transitioning from low to medium level of information availability (INFO1 to INFO2), but their preference for further increases diminishes (INFO2 to INFO3), to the extent that they prefer decreased prices for accessing the greatest level of information.

Meanwhile, the enhanced availability of park guides (PG1 to PG2) is greatly appreciated, particularly in Model 2, indicating that visitors have a preference for more easily accessible guidance. The appreciation of increased pleasure – seeking experiences is highly regarded, although the degree of preference differs among models, with Model 2 demonstrating a greater inclination to pay more for the most intense hedonistic experiences (HE2 to HE3). These insights aid in comprehending how admission costs can be modified to coincide with improvements in amenities, in order to align with visitor preferences. This ensures that fee increases are accompanied by equivalent advances in their experience. Gaining insight into these preferences and the accompanying readiness to spend can assist in determining admission costs and creating ecotourism activities that match visitor expectations, guaranteeing that fee hikes are supported by comparable improvements in the visitor encounter.

Table 6: Marginal Values of Differences in Attribute Levels

Differences in Attribute Levels	Visitors	
	CLGT Incorporating Model (Model 1V) %	**CLGT Interaction Model (Model 3V) %**
Amenities (AMT) AMT1 → AMT2 *Low to medium*	24.67	23.55
AMT2 → AMT3 *Medium to high*	16.83	6.99
Information availability (INFO) INFO1 → INFO2 *Low to medium*	78.11	76.83
INFO2 → INFO3 *Medium to high*	-37.24	-51.73
Park guide availability (PG) PG1 → PG2 *Basic to high*	76.74	91.69
Hedonistic experience (HE) HE1 → HE2 *Low to medium*	48.70	35.01
HE2 → HE3 *Medium to high*	38.44	52.24

4.0 Conclusion and Policy Recommendations

This study set out to investigate tourists' preferences for various improvements in ecotourism services and management at the Semenggoh Wildlife Centre (SWC) and Matang Wildlife Centre (MWC), with a specific focus on their willingness to financially support these enhancements through revised entrance fees. Using a choice experiment (CE) approach, respondents were

presented with hypothetical scenarios involving different combinations of ecotourism attributes – namely amenities, information, park guides, and hedonistic experiences – across varying levels. Data collected from 352 respondents, most of whom were relatively young (aged 18–35) and held at least an undergraduate degree, were analysed using conditional logit models to estimate the marginal utility of each attribute.

The first objective, which sought to analyse visitors' preferences for diverse upgrades in ecotourism service delivery and conservation initiatives, was fulfilled by estimating preference parameters for numerous attribute levels within the CE. The findings suggest that visitors predominantly favour moderate amenities (AMT2) and moderate information accessibility (INFO2). The availability of park guides was positively regarded, indicating that guided experiences constitute a crucial element of visitor satisfaction.

Analysis of preference heterogeneity demonstrated substantial disparities among socioeconomic groups. Senior tourists exhibited a greater inclination for superior amenities (AMT3). Female visitors had a weaker inclination towards a heightened level of hedonistic enjoyment (HE2). Visitors with elevated income levels favoured the maximum information availability (INFO3) and high-level hedonistic experiences (HE2), while exhibiting marginally less support for the utmost availability of park guides, suggesting a preference for more autonomous experiences within this demographic.

The second objective was to evaluate visitors' readiness to financially endorse enhancements via adjusted admission prices, analysed through the cost attribute integrated into the CE. The findings indicate that visitors are predominantly in favour of increased entrance prices in return for better ecotourism services and augmented conservation initiatives. This signifies a favourable inclination to financially support the sustainability of MWC and SWC, especially for enhanced ecotourism experiences and the conservation of Bornean orangutans.

The results highlight important implications for designing effective, inclusive, and financially sustainable ecotourism policies. By integrating these insights, several targeted strategies are recommended to align fee structures and service offerings with visitor preferences and socioeconomic diversity, ultimately strengthening conservation financing and enhancing visitor satisfaction.

First, a tiered pricing strategy is recommended. By linking entrance fees to clearly defined service levels, particularly medium-level amenities (AMT2) and information (INFO2), the centres can balance revenue generation with perceived value for money. This approach allows visitors to pay according to the quality of experience provided. Investments should focus on enhancing infrastructure and information provision to a moderate level, as this is where the most significant increase in WTP was observed. Meanwhile, more cautious investment should be made in upgrading to higher levels (AMT3 or INFO3), given the marginal utility diminishes beyond the medium tier.

Second, targeted service enhancements can be developed based on visitor demographics. For instance, older tourists are more likely to value basic comforts and moderate improvements in facilities, while wealthier visitors show stronger preferences for richer informational content (INFO3) and hedonistic offerings (HE2). Therefore, marketing campaigns and service design should cater to these distinct groups without marginalizing others. Enhancing the availability of park guides (PG2) is especially crucial, given its consistent importance to all segments. This

could involve recruiting additional trained guides or leveraging volunteer-based interpretive programs to meet demand cost-effectively.

Third, the development of income-based segmentation strategies can help maintain affordability while optimizing revenue. This includes offering discounted entrance fees or special packages for specific groups, such as students, the elderly, or low-income households. Pricing could be anchored around the median income bracket to reflect the majority's financial capacity. At the same time, the centres could introduce premium packages for higher-income visitors, offering exclusive benefits such as fast-track entry, private guided tours, or access to special facilities. Family-oriented discounts would also increase accessibility for households with children. In addition, MWC and SWC could explore partnerships with local governments or NGOs to subsidize entry for underserved communities, thereby promoting inclusive access to ecotourism experiences.

Lastly, the study supports the use of precision marketing and personalized ecotourism services. By tailoring communication and packages to visitor characteristics, the centres can better meet expectations and improve satisfaction. For example, elderly tourists may prefer nature walks with seating areas and educational briefings, while younger or higher-income groups may respond more positively to digital interpretive tools or immersive experiences.

This study contributes valuable empirical evidence for the design of more sustainable, inclusive, and economically viable ecotourism policies at SWC and MWC. By leveraging visitor preferences and WTP data, park authorities can ensure that improvements in services are aligned with expectations, that entrance fees are perceived as fair, and that conservation goals are adequately funded. These recommendations promote a balanced model where environmental stewardship, financial sustainability, and visitor satisfaction reinforce one another.

Declaration Section

Ethical approval: This study is a non-clinical, low-risk social science investigation that does not involve vulnerable populations, religious or culturally sensitive issues, or the collection of sensitive personal data. As such, it falls within the category of research that is not subject to formal ethics approval under the institutional guidelines of Universiti Malaysia Sarawak (UNIMAS). The requirement for ethical approval was waived by the Human Research Ethics Committee, Universiti Malaysia Sarawak. The study was conducted in full compliance with the *Standard Operating Procedure for Handling Ethical and Sensitive Data in Open Science* (approved 26 July 2024), which outlines principles of responsible data management, confidentiality, and informed consent.

Consent to participate: All participants were informed of the objectives and procedures of the study prior to their involvement. Informed consent was obtained from all participants before participation. Participant data were anonymized and handled securely in accordance with UNIMAS open science and data protection protocols.

Consent to publish: Not applicable.

Data Availability: The datasets generated and/or analysed during the current study are available from the corresponding author upon reasonable request.

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References

Asri, N. A. & Musa, F. (2021). Tourists' attitudinal factor towards Mangrove conservation: A case study of Kilim Karst Geoforest Park, Langkawi, Malaysia. *Transactions on Science and Technology, 8*(3 – 2), pp. 260 – 266.

Bishop, R. C. (1978). Endangered Species and Uncertainty: The Economics of a Safe Minimum Standard. *American Journal of Agricultural Economics, 60*(1), pp. 10 – 18.

Brock, M., Cromie, R. L., Newth, J. L. & Wood, K. A. (2025). Using choice experiments to understand public preferences for reducing lead – based ammunition for environmental and health improvements in wetlands ecosystems. *Journal for Nature Conservation, 84.*

Dudley, N. (2008). *Guidelines for Applying Protected Area Management Categories*. Gland, Switzerland: IUCN The World Conservation Union.

Fausold, C.J., & Lilieholm, R.J. (1996). The economic value of open space. *Land Lines, 8*(5).

Hanley, N. & Barbier, E. B. (2010). *Pricing nature: Cost benefit analysis and the environment*. Northampton, MA: Edward Elgar.

Hanley, N., Mourato, S., & Wright, R. E. (2001). Choice Modelling Approaches: A Superior Alternative for Environmental Valuation? *Journal of Economic Surveys,15*(3), pp. 435-462.

Hasan – Basri, B. & Karim, M. Z. A. (2016). Can benefits in recreational parks in Malaysia be transferred? A choice experiment (CE) technique. *International Journal of Tourism Research, 18*, pp. 19 – 26.

Hernandez, D. & Costa, P. (2022). The economic value of ecosystem conservation: A discrete – choice experiment at the Taravo Wild River in Corsica, France. *Knowledge & Management of Aquatic Ecosystems, 423*(16).

Ibrahim, M. S. N., Johari, S., Assim, M. I. S. A., Mohammad, S. K. W., Afandi, S. H. M. & Hassan, S. (2024). An economic assessment on public well – being for biodiversity conservation in Gunung Mulu National Park, Sarawak, Malaysia. *Environment, Development and Sustainability, 27,* pp. 14497 – 14521.

Klemperer, W. D. (1996). *Report on Forest Resource Economics and Finance*. Virginia Polytechnic Institute and State University, College of Forestry and Natural Resources. McGrow-Hill Series.

Lancaster, K. J. (1966). A New Approach to Consumer Theory. *Journal of Political Economy,* pp. 132 – 157.

Lévesque, A., Gagné, L. & Dupras, J. (2022). Expressing citizen preferences on endangered wildlife for building socially appealing species recovery policies: A stated preference experiment in Quebec, Canada. *Journal for Nature Conservation, 69.*

Louviere, J., & Hensher, D. (1982). On the design and analysis of simulated choice or allocation experiments in travel choice modelling. *Transportation Research Record*, pp. 11 – 17.

Louviere, J., & Woodworth, G. (1983). Design and analysis of simulated consumer choice or allocation experiments: An approach based on aggregate data. *Journal of Marketing Research, 20*(4), pp. 350 – 360.

Louviere, J., Hensher, D., & Swait, J. 2000. Stated Choice Methods: Analysis and Application. Cambridge: Cambridge University Press.

McFadden, D. (1974). Conditional Logit Analysis of Qualitative Choice Behavior. In Zarembka (Ed.), *Frontiers in Econometrics* (pp. 105-142). New York, NY: Academic Press.

Mitchell, R. C. & Carson, R. T. (1989). *Using surveys to value public goods: The contingent valuation method.* Washington, DC: Resources For the Future.

Muhamad, W. N. H., Radam, A. & Yacob, M. R. (2014). Using choice experiments to understand visitors preferences for the man – made lake ecotourism services in Terengganu, Malaysia. *Journal of Marketing and Consumer Research, 4*, pp. 41 – 50.

Munasinghe, M. (1993). Environmental issues and economic decisions in developing countries. *World Development, 21*(11), pp. 1729 – 1748.

Musa, F. & Shahrudin, I. N. M. (2023). Estimating the visitor's willingness to pay towards biodiversity conservation at Kuala Lumpur Forest Eco Park, Malaysia, using the contingent valuation method. *Biodiversitas, 24,* pp. 3690 – 3699.

Mzek, T., Samdin, Z. & W. Mohamad, W. N. (2022). Assessing visitors' preferences and willingness to pay for the Malayan Tiger conservation in a Malaysian National Park: A choice experiment method. *Ecological Economics, 191.*

Nunes, P. A. (2002). *The contingent valuation of national parks: Assessing the warmglow Propensity Factor.* Massachusetts, MA: Edward Elgar.

Othman, J. (2007). Economic valuation of household preference for solid waste management in Malaysia: A choice – modelling approach. *IJMS,* pp. 189 – 212.

Pearce, D. & Moran, D. (1994). *The economic value of biodiversity.* London, United Kingdom: Routledge.

Pearmain, D., Swanson, J., Kroes E. & Bradley, M. (1991). Stated preference techniques: a guide to practice. 2nd ed. Steer Davies Gleave and Hague Consulting Group.

Rolfe, J., Alam, K., Windle, J. and Whitten, S. (2004). *Designing the choice Modelling Survey instrument for Establishing Riparian buffers in the Fitzroy Basin: Establishing The Potential For Offset Trading In The Lower Fitzroy River* (Research Report No. 3). Central Queensland University, Australia: Emerald.

Yacob, M. R., Radam, A., & Awang, K. W. (2008). *Economic Valuation of Marine Parks Ecotourism Malaysia: The Case of Redang Island Marine Park*. Serdang, Malaysia: Universiti Putra Malaysia Press.