Tourists' preferences for nature: do they change after their experience?[1]

Thamarasi Kularatne*, Clevo Wilson*
**School of Economics and Finance, Queensland University of Technology, Brisbane QLD 4000, Australia*

Abstract:

Nature based tourism has gained an important position in contributing to the dual goals of nature conservation and generating an income stream from the natural environment. To be more effective in providing services which facilitate the achievement of these goals, stakeholders need to identify tourists' preferences and how they value their nature and wildlife experiences. Tourism, as an experiential good has the potential to impact tourists' awareness, appreciation and actions in relation to the specific wildlife they encounter and the environment in general. Therefore, user preferences and valuations of nature and wildlife may change as a result of the experience. Exploring the valuation of environmental goods by analysing changes in respondents' willingness to pay (WTP) before and after experiencing the good is, however, an area that has been given little attention in the literature. This research attempts to show how exposure to the environment is an influencing factor in the value formation of tourists as consumers.

This study employs two choice experiments using the same sample of tourists before and after taking part in a nature and wildlife tour in Sri Lanka. They included alternative scenarios of identified trip attributes in relation to wildlife and services provided. A multinomial logit model is used to investigate the changes in user preferences, before and after the experience. The results indicate that tourists' preferences for nature, wildlife and related services significantly improve after experiencing the tour. The paper also draws attention to future policies that could be designed to improve the quality of tourists' experiences.

[1] Preliminary draft-please do not quote without authors' permission.

1. Introduction

Globally, travel and tourism industries are increasingly focussed on the fulfilment and rejuvenation of tourist experiences. Nature based tourism - one of the fastest growing sectors in recent years - makes use of a country's diverse natural resources to help fulfil tourists' needs and enhance their experiences. By examining the demand side of tourism, it is possible to identify the attributes that attract tourists to a particular country and thereby protect such natural resources.

Nature based tourism involves excursions to national parks and wilderness areas, particularly in developing countries where a large portion of the world's biodiversity is concentrated (Olsen, Crawford-Welch, & Tse, 1991; Tisdell & Wilson, 2012). Many such countries promote nature-based tourism with the aim of securing a dual dividend of nature conservation and income generation (Chaminuka, Groeneveld, Selomane, & van Ierland, 2012; Hearne & Salinas, 2002; Tisdell & Wilson, 2012). In order to derive an optimal outcome for the tourism industry from the use of these natural resources and to provide better quality tourism services, decision makers need to incorporate tourists' preferences for nature based attractions for any given destination.

World tourist destinations (including natural attractions) are becoming subject to increasing competition given the growth in the number accessible to travellers. To retain long term competitiveness in the global tourism market, countries need to develop new competitive strategies to create differentiated market positions (Huybers & Bennett, 2000). For example, decision makers may attempt to promote the uniqueness and the superiority quality of a destination as a marketing strategy.

Destination attributes of a nature region and its wildlife are frequently promoted by countries as a strategy to attract inbound visitors. In addition, effective provision of related services such as

accommodation and information for inbound tourists is typically provided to improve the experience. In this way satisfied tourists' positive word of mouth gives rise to repeat visits and the sustainability of nature based tourism. Equally, identification of attributes which attract tourists to a particular destination often provides the rationale to protect and preserve the natural resources.

Unlike other commodities, tourism as an experiential good is able to impact consumers' preferences. Thus the public value of environmental goods are subject to change as a result of experiencing the good in question (i.e. landscape) (see for example, Tinch, Colombo, & Hanley, 2011). Nature based tourism in particular, involves the connection of human beings with little known facets of nature, its habitats and wildlife. Through direct experience therefore consumers can, for example, acquire an understanding of the need for biodiversity conservation – desirable not only for the protected viewed but also for the environment in general. However there is a dearth of literature which investigates how tourists' preferences toward nature and wildlife change after experience. This paper aims to help fill this gap in the literature through a survey which uses a non-market valuation technique.

A study investigating about the variation in preferences of tourists before and after experiencing environmental goods and services can be seen as particularly useful for industry stakeholders providing nature based tourism and services. Such a demand side exploration of tourist preferences is particularly important where the long run attraction of high end tourists is a priority. This study can also support the wider rational for conserving a country's natural resources as a whole.

The structure of the paper is as follows. The second part presents an overview of existing relevant studies in the field of tourism and outlines the methodology. Section 3 provides background information on the study's Sri Lankan context and is followed by a description of the survey design.

Section 3 presents empirical results from the estimated models. The paper concludes with a discussion of the results and outlines a number of policy implications.

2. Literature review

Some particular resource allocation decisions, such as those involving environmental resources are typically not reflected by market transactions. Non-market valuation techniques such as choice modelling are therefore important tools to be used to calculate a more accurate values for such environmental resources. Through these techniques a monetary value (or a non-market value) can be placed on goods and services that are not commonly "bought" and "sold" in existing markets (Yao & Kaval, 2011). In this study a choice modelling approach, (one of a number of non-market valuation techniques) is considered the most appropriate because of the flexibility, cognitive transparency and the more realistic decision framework it provides (Alberini & Kahn, 2009).

This discrete choice modelling approach used evaluates the preferences of tourists visiting nature based attractions. It is recognised that choices by such tourists regarding environmental goods involve trade-offs which must be made when deciding between hypothetical trip scenarios which involve various attributes. It is these trade-offs which the choice experiments is designed to evaluate. The literature indicates that discrete choice modelling gives reliable approximations of real consumer behaviour (Louviere, Hensher, & Swait, 2000), and is ideal for measuring complex trade-offs (Louviere, 1988). Moreover it allows researchers to calculate marginal willingness to pay (MWTP) values for non-market goods such as tourism.

The significance of the natural environment for tourism is well documented (Fredman, Wall-Reinius, & Grundén, 2012; Tisdell & Wilson, 2012). In recent years a number of countries[2] have increasingly used the natural environment for tourism promotion. In light of this rapid growth of environmental

[2] for example, Costa Rica, Ecuador, Kenya, Madagascar among others.

tourism choice experiments have been increasingly used to analyse user preferences for environmental resources and to estimate the value of non-market goods and services such as tourism. However use of choice experiments to investigate preferences of tourists before and after experiencing natural attractions is not common in the literature.

Studies which attempt to capture how preferences of tourists for particular protected areas and natural parks are formed include Hearne and Salinas (2002), R. Hearne and Santos (2005), Naidoo and Adamowicz (2005) and Hearne and Tuscherer (2008) among others. Kelly, Haider, Williams, and Englund (2007) used choice modelling to examine visitor preferences for a set of hypothetical tourism destination eco-efficient strategies. In another study Huybers and Bennett (2000) found that potential overseas tourists to the UK were willing to pay a substantial premium to visit a destination with high level environmental quality. They were also willing to tolerate additional fees for services that might help to offset the environmental impacts of their behaviours. Naidoo and Adamowicz (2005) show that tourists are increasingly willing to visit a protected area when the number of bird species is increased independent of all other factors. These results provide some convincing evidence that protecting nature is important for the promotion of nature based tourism.

This paper attempts to show how the exposure to the environment itself is an influencing factor in the value formation of consumers (tourists, in this case). This was first elucidated by Reiling, Boyle, Phillips, and Anderson (1990) in their description of the inter-temporal process of value formation. They showed that individual valuations could be different between use values and non-use values especially for experiential goods (such as tourism). Other studies indicate that when environmental goods are involved, individuals are frequently unfamiliar with them and have no monetary conception of their values (unlike familiar use goods) (see for example, Cummings, Brookshire, Schulze, Bishop, & Arrow, 1986 p. 108; Gregory, Lichtenstein, & Slovic, 1993 p. 181). Accordingly

individual non-use valuations may have reliability issues. Therefore one way to overcome this problem and obtain more accurate valuations is to use pre and post experience studies.

As noted, exploring the valuation of environmental goods by analysing changes in respondents' willingness to pay (WTP) before and after experiencing the good, is an area that has been given less attention in literature. This paper seeks to answer the question as to whether tourists' preferences change or remain the same after experiencing an environmental good. In other words has their utility and WTP been affected by the experience they received? From a policy perspective, industry stakeholders would be interested in knowing whether, in light of any change in utility, tourists would still be willing to pay the same, less or more as a result of their experience.

In order to capture tourists' preferences for nature based tourism and services, the stated preference choice modelling technique allows us to create a hypothetical scenario based on which respondents make their choices. In doing so they are required to choose a preferred alternative from a series of alternatives presented to them (Bateman et al 2002). These alternatives are described in terms of a number of attributes that are specified at different levels. In each choice set, the attribute levels of the alternatives are randomly assigned.

The theoretical approach for choice modelling is based on Lancasterian consumer theory (Lancaster, 1966) where utility is defined as a weighted sum of a set of characteristics. When this is applied to our study, the so called characteristics can be defined as a set of attributes of a nature tour which tourists choose to undertake in their leisure time. The econometric basis for choice modelling is provided in random utility theory (McFadden, 1974), where choice is assumed to be made on the on the basis of relative utilities derived from alternative options available in a choice set. The most important feature of the random utility models is that the utility of the respondents cannot be fully

observed by the researcher. There is an observable as well as unobservable component in the choice behaviour. Hence the utility of tourist *n* gains from choosing a trip alternative can be expressed as;

$$U_n = V_n + \varepsilon_n \quad (1)$$

V_n is the systematic (explainable) component, often called the observed representative utility or deterministic utility (Hensher, Greene, & Rose, 2005; Louviere et al., 2000; Train, 2003). ε_n is the unobservable random (unexplainable) component. The multinomial logit (MNL) model is most widely used because of the ease of model estimation when compared to other models (Train, 2003). In MNL, the probability of tourist n in choosing trip alternative *i* can be shown as:

$$P_{in} = \frac{\exp(V_{in})}{\sum_{j \in J_n} \exp(V_{jn})} \quad (2)$$

The marginal willingness to pay (MWTP) is the amount of money that the respondents are prepared to pay in order to retain their original utility level prior to a change in one of the product attributes (Boxall & Adamowicz, 1999). MWTP can be calculated by the ratio of individual coefficients, which is represented by the level of the attribute over the price coefficient (Hensher et al., 2005). This is presented in equation (3). For each attribute the MWTP represents the marginal rate of substitution between the price and that attribute.

$$MWTP = -\frac{\frac{\partial V}{\partial x}}{\frac{\partial V}{\partial p}} = -\frac{\beta_{attribute}}{\beta_{price}} \quad (3)$$

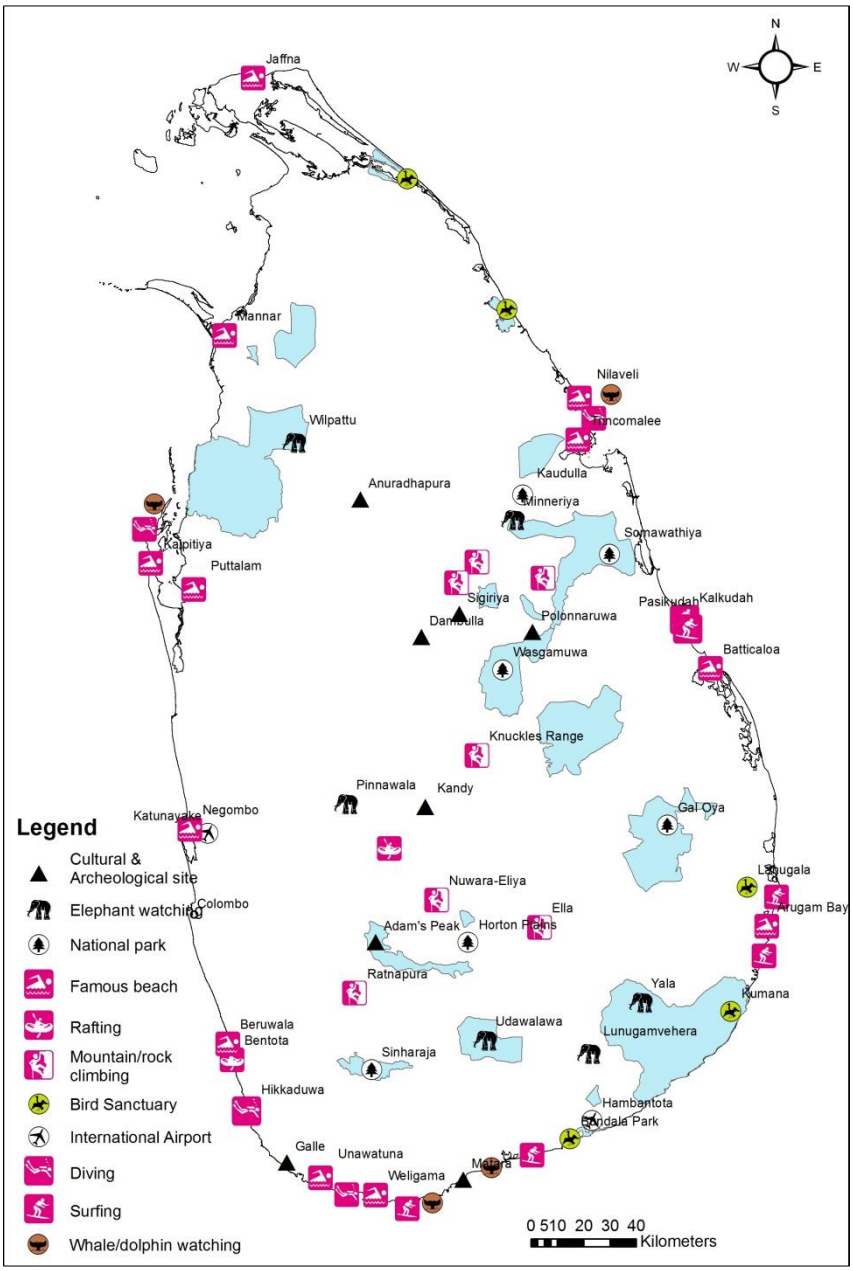
3. Material and methods

3.1 Study area

The choice experiment was undertaken in Sri Lanka, a tropical island country in South Asia, well known as a tourist destination for its authentic environmental diversity and cultural heritage. Since the end of the civil war in 2009, tourism has been increasing recognised by policy decision-makers as

the sector which has the highest growth potential in the post war development scenario. In 2012, 1 million foreign tourists visited Sri Lanka a number which is projected to grow to 2.5 million by 2016. The primary tourism demand for Sri Lanka is based on its environmental appeal and anecdotal evidence indicates it is this which attracts most high paying tourists.

Figure 1: Nature-based tourism attractions in Sri Lanka



There is large number of widely visited natural attractions in Sri Lanka. Among them, the Yala, Wilpattu, Udawalawe, Kumana, Minneriya, Sinharaja and Wasgamuwa national parks and wildlife

sanctuaries are considered as the best destinations (Figure 1). Sri Lanka is also known to offer a wide range of adventure tourism including white water rafting, canoeing, mountaineering, wildlife safaris, scuba diving and snorkelling, hiking/trekking and surfing all of which make substantial use of the country's natural resources.

The extent of Sri Lanka's rich biodiversity and scenic beauty means they are the primary attraction for tourists. Sri Lanka is known to have one of the highest rates of biological endemism in the world, and is included among the top 25 biodiversity hotspots. Of the ninety-one species of mammals found in Sri Lanka, Asian elephants, sloth bear, leopards, sambar and wild buffaloes are the most popular attractions for the majority of wildlife tourists. The rarest Sri Lankan mammals - the red slender Loris, Toque Macaque, and Purple-faced Langur which are endangered species due to habitat loss – are also important attractions. The ocean around Sri Lanka is home to large families of cetaceans including blue whales, sperm whales and dolphins. Altogether, 26 species of cetaceans are found in the waters surrounding Sir Lanka making it a particularly attractive location for whale and dolphin watching. There are also around 433 bird species including 20 endemic species. In addition Sri Lanka has one of the richest diversity of amphibians in the world, totalling over 106 species, 90 of which are endemic. The country has long claimed to have, globally, the highest amphibian species density with a particularly marked concentration in the Sinharaja rainforest.

Although Sri Lanka may have environmental features superior to many other tropical destinations, the long term competitiveness of the country's nature-based tourism is determined by the sustained quality of environmental resources used for tourism. The use of environmental resources for tourism is often associated with open-access problems such as 'free-riding' which could result in deterioration through overuse (Huybers & Bennett, 2000). This paper aims to highlight the importance of protecting and preserving such natural resources and thereby point to the need for policy makers to act expeditiously in the interest of long term viability of these resources.

3.2 The survey design:

The choice experiment was conducted with the involvement of ten destination management companies which undertake nature-based tours in Sri Lanka. The tours include visits to various natural attractions such national and wildlife parks (for example Yala National Park, Udawalawe National Park) where international tourists can have first-hand experience in wildlife watching and in enjoying the exotic natural environment. The surveying of a number of these clients ensured that environmentally conscious nature tourists were included in the sampling frame the more so given the tour packages were of considerable length and generally include accommodation facilities and tour guide services.

The survey was conducted between November 2014 to April 2015. These months represent the peak season for tourist arrivals in Sir Lanka. Each tourist was distributed a pack of two similar questionnaires for self-completion: one to be completed at the beginning of the tour (pre-visit questionnaire) and the other at the end of the tour (post-visit questionnaire). The length of the tour was approximately 9 days. The questionnaires were made available in four languages (i.e. English, French, Japanese and German) in order to capture respondents from different backgrounds.

The attributes and levels used in this study were carefully chosen and developed subsequent to an extensive literature review of previous research. Revisions to attributes and levels were made after discussions with a number of experienced tour operators. We defined five attributes - four with three levels and one with two levels - and which were based on experiences that a participant would potentially receive by taking part in a nature tour in Sri Lanka. These attributes were qualitative in nature except for the cost attribute which was quantitative. The list of attributes and levels are displayed in Table 1.

Table 1: Choice attributes and related levels

Attributes	Levels	Explanation
1. Condition of the natural environment	i. Excellent	Uncontaminated wilderness, not crowded, quiet, no development in the vicinity
	ii. Good	Uncontaminated wilderness, sparsely crowded and quiet, average development in the vicinity
	iii. Satisfactory	Moderately crowded, less quiet, few buildings in the vicinity
2. Number of species to be encountered	i. More than 100	A large number of mammals, birds and reptiles,
	ii. Between 50-99	A moderate number of mammals, birds and reptiles
	iii. Less than 49	A small number of mammals, birds and reptiles
3. Quality of the information provided	i. Specialised guides	Specialised information will be provided
	ii. Non-specialised guides	Non- specialised information will be provided
4. Three star accommodation, food and recreational facilities	i. Excellent	Met all my expectations
	ii. Good	Met most of my expectations
	iii. Satisfactory	Met some of my expectations
5. Cost of the tour (per person)	i. US$ 2000	
	ii. US$ 1500	
	iii. US$ 1000	

Condition of the natural environment: This attribute describes the level of environmental quality in natural parks and surrounding areas. The quality is defined by the amount of pollution, visitor crowdedness and the level of development in the vicinity. Brau (2008) found that tourists are averse to the substantial modifications of an untouched environment. Therefore, the underlying assumption is that an untouched wilderness is more preferable than an environment which is crowded and has experienced a level of development. Three levels are assigned as excellent, good and satisfactory.

Number of species to be encountered: This attribute refers to the chance of encountering wild species during the tour (observing wild species in a natural setting being one of the key features of a nature tour). Natural parks and wildlife sanctuaries in Sri Lanka consist of a wide variety of mammals, birds and reptiles including certain threatened species. This study expects that the possibility of encountering a large number of wild species would appeal more positively to highly motivated nature tourists. The levels for this attribute are defined as *more than 100*, *between 50-99* and *less than 49*.

Quality of the information provided: The third attribute refers to the type of information and interpretation services provided to the tourists during the tour. According to the choice experiment by Robert R. Hearne and Salinas (2002), tourists had a significant preference for greater information. Therefore the research assumption is that tourists have a greater preference for specialised information.

Three star accommodation, food and recreational facilities: This attribute aimed at capturing tourists preferences for accommodation and related facilities during the period of the tour. Since this attribute consists of three components, we chose to include only three star accommodation in order to simplify the decision making process. Moreover, consistency in the level of accommodation helped to determine the levels in the price attribute. This study assumes that the better the facilities, the higher will be the utility to tourists. The three levels of natural environment quality are defined as *excellent*, *good* and *satisfactory*.

Respondents were presented with a hypothetical scenario in which they undertake a nature tour of 7 days with a destination management company. They were asked to consider various trip packages and experiences and choose a preferred option based on what they are willing to pay for each alternative. Respondents had to choose between three unlabelled alternatives and a ‘no-choice’

option. The no-choice or opt-out option was included because it reflects real market choice behaviour and provides a higher degree of reality as the surveyed tourists are not forced to choose a trip in which the configuration of attributes does not match with their preferences. In addition this status quo alternative improves the statistical efficiency of parameters estimated from discrete choice models (Adamowicz & Boxall, 2001; Bateman et al., 2003; Bennett & Blamey, 2001; Louviere et al., 2000). An illustration of a choice set is presented in Figure 2.

Figure 2: Example of a choice set

ASSUME THAT THE FOLLOWING ARE THE ONLY CHOICES AVAILABLE TO YOU WHEN UNDERTAKING THIS TOUR. BASED ON THIS WHICH ONE OF THEM WOULD YOU PICK?

	Trip 1	**Trip 2**	**Trip 3**
Condition of the natural environment	Satisfactory	Good	Excellent
Number of species to be encountered	More than 100	Between 50-99	Between 50-99
Quality of the information provided	Non-specialised guides	Specialised guides	Non-specialised guides
Three star accommodation, food and recreational facilities	Excellent	Good	Good
Cost of the tour	US$ 1000	US$ 1500	US$ 2000

I would choose Trip 1 ☐
I would choose Trip 2 ☐
I would choose Trip 3 ☐
I would choose none ☐

Please tick only one box

The number of attributes and levels allowed for 162 possible combinations of choice scenarios ($3^4 \times 2^1 = 162$). A full factorial design producing all possible combinations of attributes and levels would allow all the main and interaction effects to be estimated. However, in practice, use of such a large design is impractical. This was reduced using an experimental fractional factorial design. We used an orthogonal design with a foldover (Hensher et al., 2005) using Ngene software to reduce the number of choice scenarios to 36. The 36 scenarios were further blocked into four with each questionnaire containing nine choice sets. Orthogonality ensured that there would be no multicollinearity between

the attribute levels in choice situations (Hensher et al., 2005). Identical choice options were completed by the respondents at the beginning as well as at the end of the tour.

4. Empirical results

4.1 Tourist demographics

Out of the 360 questionnaires distributed among different tour operators, 146 completed questionnaires were returned for an effective response rate of 40.5%. Of the completed questionnaires returned, 10 were not included because of non-responses to important variables in the analysis and/or partially completed returns (only pre-visit or post-visit completed). Therefore the final sample size was 136 respondents. 33% of the sample was represented by the 51 to 60 age category and 56% were females. A majority of the sample (75%) were employed or self-employed while over one-third (35%) reported an income of US$ 60,000 and above. A high proportion - 78% - of tourists had a tertiary education. The main socio-demographic characteristics of the sample are presented in Table 2.

The questionnaire included a section which recorded background information on respondents' decision to take part in the tour and preferences which are not captured in the choice experiment (Table 3). The summary of the responses is given in Table 3. Ninety-six percent of the sample claimed that the tour was their first visit to Sri Lanka. Some 63% travelled with family or a partner. The responses indicate that 'experiencing nature' is a substantial part of their decision to visit Sri Lanka. 84% of the sample (64% + 20%) indicated that wildlife, scenic beauty and beaches were the motivations to visit Sir Lanka (multiple options were allowed). Ten percent of the sample was interested in adventure tourism an activity which depended to a considerable extent on natural resources. Ninety percent considered seeing wildlife as an important part of their tour. A further 25% declared that they were a member of a nature conservation organisation. The above results

provide good evidence that the majority of respondents' held a genuine concern for the natural environment – a view subsequently reflected in the choice experiment outcomes.

Table 2: SDC of respondents

Gender	**%**
Male	**44**
Female	**56**
Age	
18 to 30	**4**
31to 40	**15**
41 to 50	**24**
51 to 60	**33**
61 to 70	**18**
71 to 80	**4**
81 and above	**0**
Education	
Primary/elementary	**0**
High school (up to 12 years of schooling)	**12**
Vocational institute	**6**
University	**57**
Post graduate	**21**
other	**4**
Employment	
Employed	**68**
Unemployed	**1**
Retired	**16**
Self-employed	**8**
Student	**1**
Other	**5**
Income	
Below US$ 20,000	**8**
US$ 20,001 - 30,000	**7**
US$ 30,001 - 40,000	**15**
US$ 40,001 - 50,000	**15**
US$ 50,001 - 60,000	**21**
US$ 60,001 and above	**35**

Table 3: Background information (percentages rounded to nearest whole number)

First visit to Sri Lanka (%)	
Yes	96
No	4
Travel arrangements	
Travelling alone	37
With partner/family	63
Motivation to travel to Sri Lanka (%)	
Wildlife/ scenic beauty	64
Beaches	20
Heritage/ culture	32
Adventure (surfing, white water rafting, snorkelling, hiking etc.)	10
Food	4
Other (please specify)	6
Importance of seeing wildlife (%)	
Very important	55
Important	35
Not very important	10
Of no importance	0
If no or fewer wildlife were to be seen in Sri Lanka, would you still have visited Sri Lanka? (%)	
Yes	5
No	23
Unsure	24
Member of nature conservation organisation (%)	
Yes	25
No	75

4.2 Model estimation

Data obtained from the questionnaires were analysed using a multinomial logit (MNL) model (NLOGIT 4.0). To examine whether preferences varied after experience, separate models were estimated for pre-visit and post-visit scenarios. We estimated models using both dummy and effects coding to avoid the interpretation bias involved in coding. To deal with status quo bias, models were estimated with and without the constant term (see for example, Bech & Gyrd-Hansen, 2005). We chose to report the results for estimated models with the constant included given that exclusion of the alternative specific constant (ASC) could lead to biased attribute parameter estimates. The ASC is therefore seen as an important element in interpreting the preferences of individuals (Hoyos, 2010;

Morrison, Bennett, Blamey, & Louviere, 2002). Table 4 presents results obtained from the regression analyses for both pre and post experience scenarios using dummy coding while Table 5 presents results using effects coding. The estimated coefficients of each attribute level shows the effect of the attribute level on the indirect utility of choice options. Although the results of this study are limited to estimating the impact of main effects only, these account for 70-90% of utility (Dawes & Corrigan, 1974).

For both models in Table 4, all coefficients were significant at α=0.01. In Table 5, all the higher levels in each attribute for both models are significant at α=0.01. The signs of the coefficients for all attributes are in accord with a priori expectations, e.g. the negative sign for the cost attribute and positive signs for higher levels of other attributes. The attribute level coefficients are generic and therefore apply equally to each trip alternative. In model 1, for example, the cost coefficient indicates that for each increase of the price by US$ 1, the indirect utility of each trip alternative falls by 0.0011. All ASCs are statistically significant below 1% level and have positive signs which means that, *ceteris paribus,* the tourists received positive utility from participating in the nature tour.

We used pseudo-R^2 to assess the model performance. According to Hensher et al. (2005) a good model has a psudo-R^2 between 0.2 and 0.4 and Louviere et al. (2000) likewise considers this range as an extremely good fit. Models 2 and 4 in this study have a psudo-R^2 value of over 0.2 while models 1 and 3 have psudo-R^2 values close to 0.2. The interpretation of results is as follows;

Table 4: Results from dummy coding

	Attributes and Levels	Coefficients	
		Pre-visit (Model 1)	Post-visit (Model 2)
1	**Condition of the natural environment**		
	Excellent	1.2425(0.0973)***	1.2199(0.0985)***
	Good	0.5617(0.1062)***	0.55075(0.1081)***
2	**Number of species encountered**		
	More than 100	0.5894(0.0992)***	1.2044(0.1058)***
	Between 50-99	0.2889(0.1037)***	0.4475(0.1094)***
3	**Quality of information provided**		
	Specialised guides	0.9988(0.0822)***	1.1201(0.0859)***
4	**Accommodation, food & recreation facilities**		
	Excellent	0.4759(0.1053)***	0.5175(0.1095)***
	Good	0.3340(0.0959)***	0.4106(0.1001)***
5	**Trip Cost**	-0.0011(0.0001)***	-0.0010(0.0001)***
	ASC (trip 1)	1.1768(0.2327)***	1.1179(0.2511)***
	ASC (trip 2)	1.3605(0.2291)***	1.1788(0.2484)***
	ASC (trip 3)	1.2599(0.2319)***	1.1582(0.2528)***
	Log likelihood	-1257.002	-1157.799
	Pseudo R^2	0.1913	0.2335
	No. of observations	1224	1224

Condition of the natural environment:

In Table 4, the indirect utility for a natural environment which is in *excellent* condition is higher than that of a natural environment which is in a *good* condition demonstrating a higher preference (higher coefficient) for the former. Similar results were obtained in the post-visit model with a greater emphasis on the excellent attribute. This suggests that the respondents increasingly preferred visiting natural attractions which were uncontaminated, uncrowded and had not undergone development activities. In Table 5 the level *excellent* for the natural environment is significantly below 1% in both pre-visit and post-visit models, although *good* is not significant.

Number of species encountered

The highly significant and positive coefficients from both models in Table 4 imply that tourists were interested in encountering a large number of species during their tour. The indirect utility for encountering more than 100 species is greater than encountering 50-99 species**.** And as shown in Table 5, although the level *between 50-99* is insignificant in the pre-visit model, we observe an altered order of utility in the post-visit model where tourists have a greater preference for encountering *more than 100* species than *between 50-99.*

Quality of information provided

The results from both Table 4 and Table 5 show that tourists have a significant preference for greater information about nature and wildlife. The coefficients are highly significant in all models although an increase in coefficients can be observed when moving from the pre-visit to post-visit models.

Accommodation, food and recreational facilities

The results clearly indicate that tourists prefer tours inclusive of excellent accommodation, food and recreational facilities. That is the level *excellent* carries a higher coefficient than *good*. Moreover, the coefficient is increasing when moving from pre-visit to post-visit both in Tables 4 and 5.

Trip cost

The coefficient for the *cost* attribute is negative for all models reflecting a significant preference for a lower trip cost.

Table 5: Results from effects coding

	Attributes and Levels	Coefficients	
		Pre-visit (Model 3)	Post-visit (Model 4)
1	**Condition of the natural environment**		
	Excellent	0.6411(0.0534)***	0.6281(0.0543)***
	Good	−0.0397(0.0589)NS	−0.0381(0.0600)NS
2	**Number of species encountered**		
	More than 100	0.2966(0.0552)***	0.6540(0.0579)***
	Between 50-99	−0.0039(0.0579)NS	−0.1027(0.0601)*
3	**Quality of information provided**		
	Specialised guides	0.4994(0.0411)***	0.5600(0.0430)***
4	**Accommodation, food & recreation facilities**		
	Excellent	0.2060(0.0593)***	0.2081(0.0613)***
	Good	0.0640(0.0538)NS	0.1001(0.0558)*
5	**Trip Cost**	−0.0012(0.0001)***	−0.0010(0.0001)***
	ASC (trip 1)	2.8403(0.1900)***	3.1208(0.2070)***
	ASC (trip 2)	3.0240(0.1898)***	3.1833(0.2064)***
	ASC (trip 3)	2.9235(0.1913)***	3.1627(0.2094)***
	Log likelihood	−1257.002	−1157.332
	Pseudo R^2	0.1913	0.2333
	No. of observations	1224	1224

The overall results reflect tourists' interests in visiting untouched nature based attractions and, in particular, well protected wildlife. Their related need to acquire further specialised information about flora and fauna therefore has particular policy relevance. Further policy implications are discussed in Section 5.

It is noteworthy that the coefficient values for higher levels were greater than the coefficient values for lower levels in each attribute. This indicates that the marginal utility received by higher levels is greater than that of lower levels. That is, the utility received by a consumer increases if the quantum of the good consumed (in this case the nature tour) increases. Importantly the coefficient values

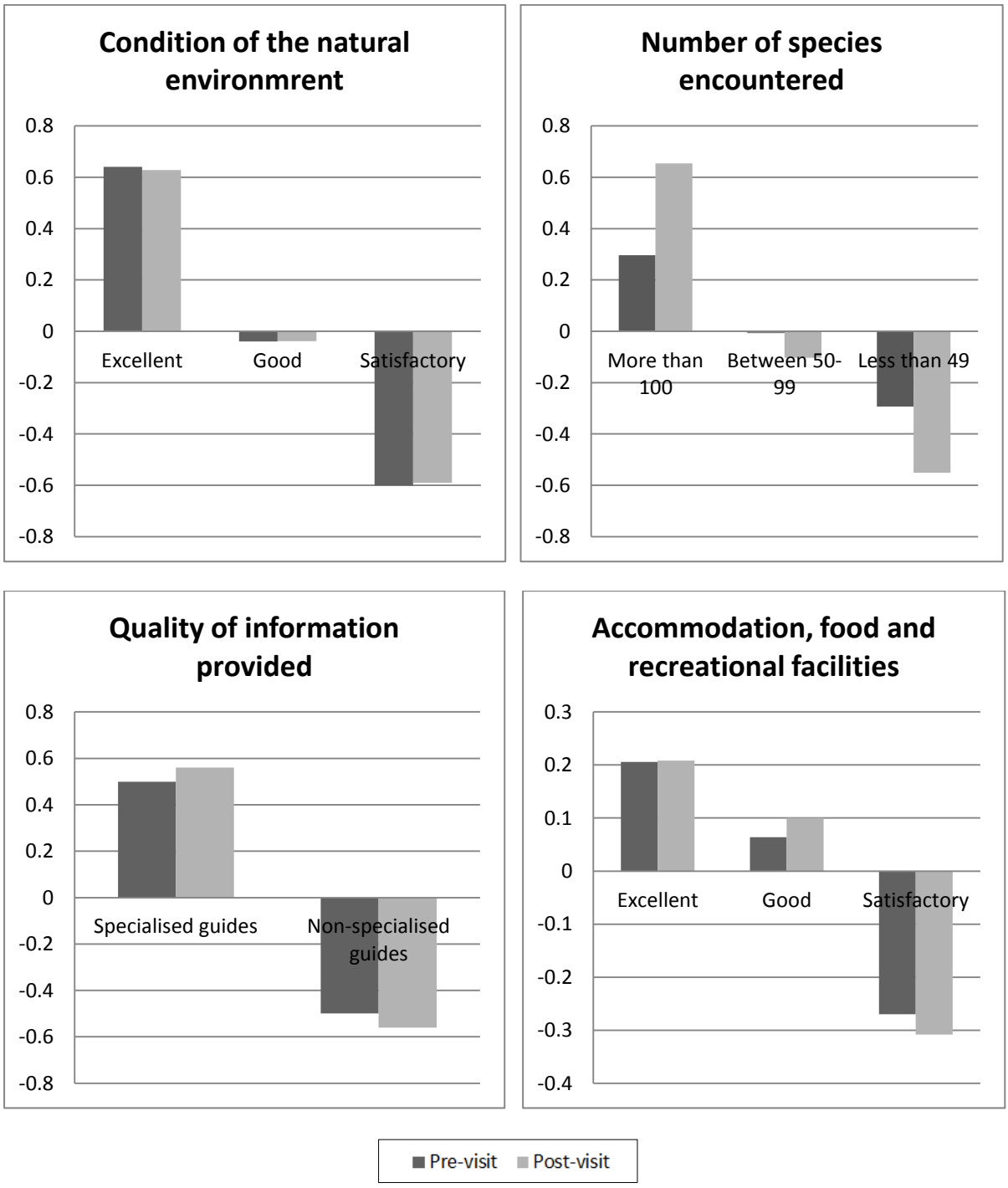
increase from pre-visit to post-visit for the majority of qualitative attributes (except for attribute 1). This indicates there is an increase in marginal utility received by a consumer after the tour experience and, therefore, the provision of nature based tourism services has been successful in meeting the consumer's need.

Effects coding resulted in contrasts between the coefficients of the levels of each attribute. The coefficient of the base level of each attribute can be calculated using the estimated coefficients of the other attribute levels. The base level coefficient is equal to the negative of the sum of the two estimated coefficients. The coefficients are depicted in Figure 1 for pre-visit and post-visit scenarios. The utility increments between two different levels on each attribute generally appear non-linear.

Figure 3 graphically demonstrates tourists' order of preferences for different levels in each attribute and how they change after the tour experience. It's important to note that the conclusions are derived from the significant variables only. The coefficients associated with *excellent* in attribute 1 is relatively large and highly significant in both pre-visit and post-visit scenarios. This implies that the condition of the natural environment is a substantial factor in determining the respondent's indirect utility from nature based tourism. Moreover, the leap in coefficients from pre-visit to post-visit for attribute 2 for seeing *more than 100* species is quite large. This implies that tourists had a high degree of satisfaction from their experience. Consistent with many other studies, tourists value specialised information over non-specialised tour information (see for example, Draper, Oh, & Harrill, 2012). Moreover, the rise in this coefficient in the post-visit model indicates their preference for information increased after the tour experience. Finally, tourists are shown to prefer greater quality of accommodation, food and recreational facilities during the time of the tour. The coefficients which relate to each level indicate that *excellent* and *good* levels of facilities and services have a positive relationship with indirect utility. But while tourists are averse to lower levels

of service the coefficients are relatively lower meaning accommodation, food and recreational facilities are not major factors in determining the overall utility of tourists.

Figure 1: Estimated coefficients of qualitative attribute levels



4.2 Results of WTP

The model results can be used to calculate the marginal willingness-to-pay estimates for each attribute in pre-visit and post-visit situations. We calculated the respondents' WTP using MNL model estimates from Table 5. Effects coding data allows us to derive the WTP values for the attribute levels of the basic alternative from the two estimated WTP values of the attribute in question as a negative sum of these two values (i.e. $WTP_{basic\ alternative} = WTP_1 \times -1 + WTP_2 \times -1$). The negative sign of some of the attribute levels indicates a reduction in the respondent's utility.

Table 7: Willingness-to-pay estimates

	Pre-visit (USD)	**Post-visit (USD)**	**Difference (USD)**
Condition of the natural environment			
Excellent	590.40	641.64	51.25
Good	-36.58*	-38.92*	-2.33
Satisfactory	-553.81	-602.73	-48.91
Number of species encountered			
More than 100	273.15	668.11	394.97
Between 50-99	-3.57*	-104.93	-101.36
Less than 49	-269.58	-563.18	-293.60
Quality of information provided			
Specialised guides	459.87	572.12	112.25
Non-specialised guides	-459.87	-572.12	-112.25
Accommodation, food & recreational facilities			
Excellent	189.68	212.61	22.93
Good	58.95*	102.29	43.35
Satisfactory	-248.63	-314.90	-66.27

* Not-significant

The willingness to pay estimates increase substantially when moving from pre-visit to post-visit for all higher levels of attributes. Thus tourists would be willing to pay US$ 590 for touring in a natural environment which is in *excellent* condition and this value rises up to US$ 641 after tour experience.

The negative WTP values for the lower levels imply that they are averse to slight modifications to the natural environment. Similarly, tourists would be willing to pay US$ 273 for a nature tour which gives an opportunity to encounter more than 100 species and this value rises by another US$ 394 post- experience. Negative values are observed for lower levels (*between 50-99* and *less than 49*). Taking attributes 1 and 2 together then, reduction of biodiversity and environmental diversity are clearly the most harmful impact on the development of the nature-based tourism industry.

A particularly interesting observation is that the tourists would be prepared to pay US$ 459 for the provision of specialised information. Indicative of tourists' apparent curiosity to learn about the wide variety of flora and fauna in visited sites, the willingness to pay increases to US$ 572 post-visit. In addition, as noted, tourists would be prepared to pay more for accommodation, food and recreational facilities which are in *excellent* and *good* condition; with a greater value for the former. This suggests that a deterioration of supported facilities would reduce their derived utility. However, the WTP values for this last attribute are relatively low suggesting related facilities play a minor role in impacting respondents' utility when taking part in a nature and wildlife tour.

A key finding from the derivation of WTP values for the two models is that tourists' valuation of nature and wildlife - as expressed by their willingness to learn or educate themselves about the environment - rises as a result of a first-hand experience in national parks and wildlife sanctuaries. The change in tourist preferences as observed by WTP values is confirmed by the results of the questionnaire in Table 6. Eight percent of respondents stated that they had extremely positive attitudes toward nature conservation before the tour. This rose by almost 29% post tour experience. This finding indicates a number of policy implications which are discussed in Section 5.

Table 6: Tourists' attitudes towards nature conservation

Attitudes towards nature conservation %	Pre-visit	Post-visit
Extreme	15	29
Strong	33	40
Moderate	31	25
Neutral	21	6

(Percentages rounded to the nearest whole number)

5. Conclusion

This paper used discrete choice modelling methodology to examine tourists' preferences for nature based tourism and services. The choice experiment is undertaken in two stages – both before and after a tour experience. The authors' objective was to investigate how tourists' preferences were affected by such an experience.

From the results of the grouped multinomial logit models a number of initial preferences are revealed. Firstly, the indirect utility for an untouched natural environment was shown to be higher than one with a lower quality. Secondly, tourists had a higher preference for encountering larger numbers of wildlife species and, thirdly, they had a strong interest in receiving more specialised information. Finally indicated was tourists' preferences for high quality accommodation, food and recreation. Importantly all the above preferences were not only replicated in the post-visit scenario but with higher attribute levels.

The study translated tourists' preferences into monetary units through marginal willingness to pay estimates. The highest WTP values were observed for maintaining natural environments in excellent condition. Tourists were similarly willing to pay more for better opportunities for seeing wildlife, for receiving more specialised information and having higher quality support services. Moreover all these preferences were found to be more strongly held after a tour experience.

In light of this evidence, this paper offers suggestions for the future direction of policy making for nature based tourism in Sri Lanka and similar destinations. Firstly, there is the evident overall need to protect and preserve the natural resources of a country as far as possible in pristine condition. The study shows that a deterioration in current environmental quality and diversity would adversely affect the demand from international tourists. Secondly, industry stakeholders (especially tour operators) should focus on the use of experienced guides to provide specialised information about nature and wildlife. This would not only improve tourists' satisfaction but also their attitudes towards nature conservation. Better facilitation of tourists' stays during tours by providing excellent accommodation and related facilities is also show to be a priority. In the case of Sri Lanka, WTP values derived before and after a tour experience could be used to more accurately set prices for the resources used in nature based tourism.

Overall, this paper presents a useful extension of the application of discrete choice modelling to nature based tourism. The two before and after experience choice experiments show how consumer preferences change as a result of experiencing an unseen natural environment. In this way useful insights are provided into the way in which nature of tourists' preferences are affected by their tour environment – an area of study which has so far received little attention in the literature.

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