Balancing conservation goals and ecotourism development in coastal wetland management in Sri Lanka: a choice experiment

Salpage Nesha Dushani [a,b,*], Margrethe Aanesen[a], Godwin K. Vondolia[a,c]

[a] The Arctic University of Norway-UiT, P.O. Box 6050 Langnes, 9037 Tromso, Norway.

[b] Faculty of Fisheries and Ocean Sciences, Ocean University of Sri Lanka, Tangalle, Sri Lanka.

[c] Norwegian Institute for Water Research, Gaustadalléen 21, NO-0349 Oslo, Norway.

*corresponding author: neshad@ocu.ac.lk

Abstract:

Understanding the tradeoff between tourism development and environmental conservation is essential for the sustainable management of ecotourism. Accordingly, we conducted a choice experiment (CE) using valuation workshops to estimate the preferences of foreign tourists for ecotourism development and biodiversity conservation in Rekawa coastal wetland in Southern Sri Lanka. Transforming preferences into marginal Willingness to Pay (MWTP), shows that guided-boat trips in Rekawa lagoon is the most important development attribute, followed by increased beach cleanup activities. The MWTP for smaller turtle-watching groups is much lower, but still significant. Tourists are also willing to pay for conservation in the form of efforts to reduce losses in biodiversity. The fact that the CE asks for contributions to future management and improvement fund, and because that many tourists do not intend to return to Rekawa, this implies that elicited values can be interpreted as either non-use or option values for those who intend to return.

Keywords: willingness to pay, tourism, biodiversity conservation, valuation workshops

1. Introduction

Coastal wetlands provide a variety of ecosystem services to support human well-being. These ecosystem services include protection from storm surges and floods, water regulation and purification, habitat protection, biodiversity conservation, carbon sequestration, education and research, and recreation. A wide range of recreational activities is possible in coastal wetlands including sunbathing, swimming, diving, snorkeling, boating, recreational fishing, bird watching, and mangrove watching. Well-managed sustainable tourism in and around coastal wetlands may provide significant benefits both economically and ecologically[1], while allowing ecosystem services to be sustained (Destination Wetland, 2012).

Estuaries and coastal ecosystems are some of the most threatened natural systems worldwide and those subjected to pressure from anthropogenic activities are decreasing at the highest rate (Lotze et al. 2006, Valdemoro et al., 2007, Worm et al. 2006). The coastal wetlands are under stress from both human-induced actions and natural causes as a result of climate change (Finkl & Makowski, 2017). It has been estimated that approximately 50% of the world's coastal wetlands have already been decimated by urbanization, industrialization, and commercial development. The remaining 50% is under extreme threat from a variety of anthropogenic activities such timber harvesting, sand mining, oil and gas exploitation, expansion of agricultural lands and aquaculture, wildlife poaching, and recreation (Finkl & Makowski, 2017). Tourism development has been recognized as a direct contributor to altering coastal wetland ecosystems due to infrastructure development, and indirectly by introducing non-

[1] Sustainable tourism can directly contribute to the environmental protection and conservation by converting natural areas into national parks and wildlife parks because of their attractions for tourists.

native species into the ecosystem (Bacon, 1987; Baldwin, 2000; Davenport & Davenport, 2006; Mejía & Brandt, 2015).

According to the *Destination Wetland Report* (2012), which was jointly prepared by the World Tourism Organization (UNWTO) and the Ramsar Convention on Wetlands, it is estimated that 50% of all international tourists travel to all types of wetlands[2], but especially to the coastal wetlands, spending around USD 925 billion each year (Wafa, 2012). Over the next 10 years, South Asia is expected to become the fastest growing region globally for tourism (WTTC, 2017). According to the WTTC (2017), South Asia experienced the second strongest growth in tourism (7.9 %), while at the country level Sri Lanka was ranked ninth among the fastest growing travel and tourism destinations in 2016. Sri Lanka has become one of the most popular tourism destinations in the region due to its diverse landscape, wildlife, and cultural heritage (Lai, 2002). The tourism industry strengthens the Sri Lankan economy, contributing 5.1% of the national gross domestic product (WTTC, 2017).

To maintain its good reputation among eco-tourists, it is important to develop the ecotourism[3] industry with minimum disturbance to nature. Baldwin (2000) argues that although tourism appears to be a sustainable industry for many tropical islands, it is still necessary to examine the ecological impact of tourism development in coastal regions. To achieve the goal of sustainable tourism management, policy makers, and decision-makers in administration should be informed about tradeoffs between tourist preferences for "wilderness" and environmental

[2] "Wetlands are broadly defined under the Ramsar Convention and include rivers, lakes, ponds, mangroves, coral reefs, reservoirs, mudflats, sandy beaches, salt pans, etc. They include areas that can be coastal or inland, natural or artificial" (Destination Wetland Report, 2012).

[3] "Responsible travel to natural areas that conserves the environment, sustains the well-being of the local people and involves interpretation and education" (TIES, 2015)

protection on the one hand, and development of tourism facilities on the other. These analyses are essential for the allocation of limited financial resources in ecotourism development.

A growing body of economic valuation literature has emphasized the distinct roles of coastal wetlands in the provision of ecosystem services (Barbier et al., 2008; Bell, 1997; Breaux et al., 1995; Costanza et al., 1989; Costanza et al., 2008; Farber, 1987). Most of the existing studies focus on commercial fisheries, coastal protection from storms, and water purification functions. A limited number of studies have been devoted to estimating the value of coastal wetlands for tourism and recreational purposes (see Bergstrom et al., 1990; Bell, 1997). Fernando et al., (2015) estimated the recreational value of Muthurajawela wetland ecosystem in Sri Lanka using the Travel Cost method. One way of estimating tourists' willingness to pay (WTP) for the development of tourist destinations is to use the contingent visitation method (CVM) (Barnes et al., 1999; Tisdell & Wilson, 2000). This approach provides an aggregate WTP (value) for tourism development. However, it does not provide the required information for decision makers about the relative importance of different attributes characterizing such development, or the potential tradeoffs in management decisions such as tourism facilities and biodiversity conservation (Louviere & Hensher, 1982).

Although the aggregate values from CVM studies are important for evaluating ecotourism development, it is important to disaggregate these values to understand their tradeoffs (i.e. tourism development vs. wetland conservation). Revealed preference methods like the Travel Cost Method, also provides estimates for the recreational value of a tourist destination. However, given our context there are some challenges applying this specific method. The fact that ~~next to~~ almost all foreign tourists visit this area only once renders a little variation in annual visitor frequency. This, in turn, implies that the recreational demand curve cannot be reliably

estimated in Travel Cost models. Furthermore, most foreign tourists stay in villages close to the turtle site and take this way by foot or bike. Hence, the local travel inflicts insignificant costs upon them, even when including time costs. Finally, most foreign tourists to Sri Lanka have multiple purposes for their trip, among which one may be to see the turtles at Rekawa. Applying a travel cost survey for foreign tourists to Rekawa this has to be corrected for, which in turn will make willingness to pay estimates very uncertain. The other fact is that revealed preference methods only provide estimates for use values but stated preference methods estimate both use and non-use values. Given that we are valuing nature (i.e. biodiversity) in which the non-use values may be potentially significant, we use a stated preference method of choice experiments. For these reasons, we decided to apply a stated preference method, the discrete choice experiment, for our purpose.

This study contributes to the coastal wetland valuation literature in two ways. It applies the choice experiment (CE) to estimate preferences for ecotourism development in a coastal wetland, with an emphasis on conservation of biodiversity and provision of tourism facilities. Kularatne (2017) studied tourist preferences for nature-based tourism and services in Sri Lankan national parks and nature refuges using a CE to compare before and after tourism experiences. Juutinen et al., (2011) applied a CE to estimate the value of biodiversity and recreational facilities at Oulanka National Park in northern Finland. Our study differs by considering the ecological nature for biodiversity attributes and also for attributes related to tourism development. Dussault (2016) argues that the concept of "ecological nature", enables humans to inhabit the earth's ecosystems in ecologically sustainable ways. By broadening the concept of ecological nature, this paper is better framed to investigate the interactions between the goals of conservation of biodiversity in the face of sustainable uses of tourism development.

The major objective of this study is to estimate tourist preferences, (expressed as WTP) for different ecotourism facilities and biodiversity protection. Our findings provide important policy implications for both the Sri Lankan tourism authorities and stakeholders for similar destinations (i.e. wetland and tourism managers in the region) to prepare sustainable planning of ecotourism facilities in coastal wetlands. We define the concept "sustainable planning of ecotourism" as an economically viable and socially acceptable development of ecotourism, which also preserves the natural attributes of the wetland. Furthermore, the findings from this study can be used for benefit transfer to similar sites in the region.

Our empirical case is the Rekawa coastal wetland in Southern Sri Lanka. The paper is organized as follows. Section 2 describes the study area. Section 3 explains the material and methods and Section 4 reports the results of the econometric analysis. This is followed by a discussion in Section 5 with the conclusions and managerial implications presented in Section 6.

2. Study area

Rekawa coastal wetland is located in the Hambantota district of Southern Sri Lanka (Figure 1). The wetland is composed of an array of coastal, terrestrial, and wetland ecosystems including Rekawa beaches, corals, and Rekawa lagoon surrounded by mangroves. It is rich in biodiversity (IUCN & CEA, 2006). This region has been identified by the IUCN (2005) as one of the prime nesting habitats for turtles. As a result, the Department of Wildlife Conservation in Sri Lanka declared the Rekawa coast as Sri Lanka's first sea turtle sanctuary in 2006. This legal protection facilitates the activities carried out by Rekawa Turtle Conservation Project (TCP) which is a community-based organization established in 1996 by converting all turtle egg poachers to conservationists to protect turtle nests in-situ (Kapurusinghe, 2012). There are five species of globally threatened sea turtles in this area; green turtle, loggerhead turtle,

leatherback turtle, hawksbill turtle, and olive ridley turtle. Each year they come to the Rekawa beach for nesting. The Rekawa coral reef is found off the northeastern side of the Rekawa headline. This is a shallow fringing reef about 100-150 m wide and 300 m long. In total, 35 species of stony corals and 138 species of reef and reef associated fish have been recorded at this reef ecosystem (IUCN & CEA, 2006).

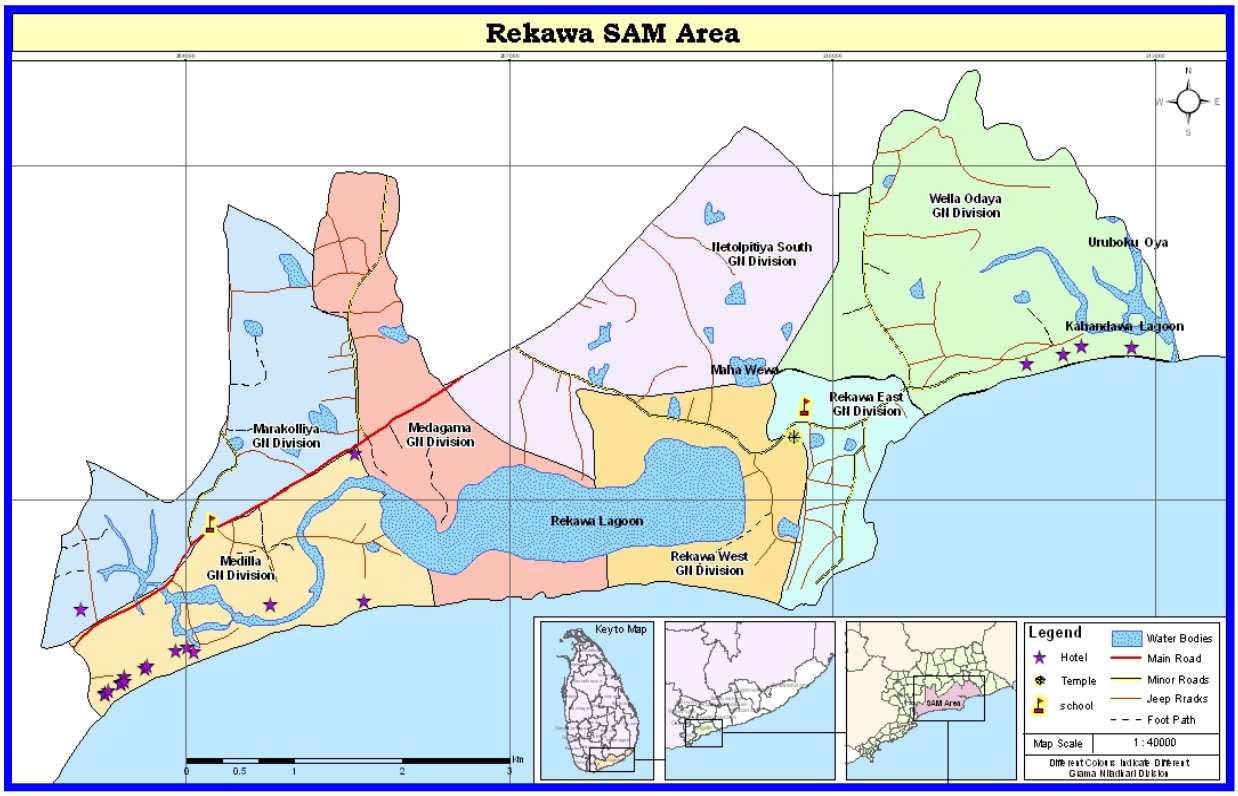

Figure 1: Location of the study area in a map of Sri Lanka

Source: Rekawa Special Area Management Coordinating Committee, Sri Lanka (1996)

The Rekawa Lagoon is approximately 250 ha with an average depth of 1.4 m and surrounded by a mangrove cover. The lagoon and mangrove habitats provide a home for many fish, shellfish, reptiles, mammals, invertebrates, and local and migratory birds (Ganewatta et al., 1995). Wild shrimp is the major resource harvested by Rekawa lagoon fishers. *Penaeus indicus* is the commercially most important shrimp species, which predominates the landings. When

shrimp catches are low, lagoon fishermen are involved in harvesting finfish (Amarasinghe, 2010). According to Jayatissa et al., (2002), approximately 11 out of 21 true mangrove species[4] are available in the Rekawa wetland. These mangrove ecosystems support ecotourism at Rekawa by providing habitats for approximately 104 bird species, of which 15 are migratory (IUCN & CEA, 2006).

Although Rekawa has a potential for ecotourism, it has not yet been fully realized (IUCN & CEA, 2006). Currently, this destination is famous among tourists for turtle watching. A few inland fishers have provided outrigger canoeing trips for tourists to enjoy the natural landscape around the Rekawa lagoon. In addition, clean sandy beaches are attractive for tourists for sun-bathing, and swimming, while snorkeling, and diving are some of the water-sports activities which can perform there.

3. Material and methods

3.1 Survey design

The survey included a CE which is a quantitative technique for eliciting individual preferences for different attributes characterizing the goods under consideration. By varying the attribute levels, some alternatives were formulated and presented in a choice card. The respondents then chose the alternative they prefer, which was typically repeated on 6-12 choice cards. To conduct the CE, we employed four focus groups (including stakeholders from the Rekawa ecotourism industry and other stakeholders) to select attributes and attribute levels. The focus

[4] "Mangrove species are classified as true mangroves and mangrove associates" (Wang et al., 2011). True mangroves differ physiologically and ecologically from mangrove associates, in their survival ability in the mangrove environment.

groups consisted of the following members; the Turtle Conservation Project (TCP) members; local tourist guides and drivers; lagoon and marine fishers; hotel managers; home-stay providers; government officers from the Department of Wildlife Conservation and Department of Fisheries; representatives from a local non-profit-organization; and villagers who are interested in engaging in ecotourism in Rekawa. We used various participatory rural appraisal (PRA) techniques in the focus group discussions including "resource map", "pair-wise ranking method", "matrix-ranking method", and "strengths-weaknesses-opportunities-threats (SWOT) analysis" to identify the ecotourism potential in Rekawa.

After the PRA session, the groups proposed various ecotourism-related activities. Considering the scope of this study, a few attributes were selected, and cultural tourism activities (i.e. cultural shows and Sri Lankan traditional cuisine) were removed. The selected attributes for the survey were as follows: "Number of tourists per turtle-watching tour", "Expenditure on beach cleanup activities", "Boat trips around the Rekawa lagoon", and "Biodiversity". The first three attributes focus on ecotourism facilities aiming at improving tourism services, while the fourth represents a truly ecological characteristic. During our preliminary investigations in Rekawa, we collected information from foreign visitors about their willingness to pay to Rekawa wetland fund, after explaining the proposed improvements in Rekawa ecotourism facilities and biodiversity conservation. The attributes and their levels are presented in Table 1.

The survey questionnaire included four parts (see Appendix 1). The first part explains the objective of the study and provides background information about the status of ecotourism in Rekawa coastal wetland. The second part starts with explaining the attributes and the levels they take, and then presents the choice cards to be completed. Each tourist was asked to

complete 10 choice cards. The cards were designed to maximize expected Bayesian d-efficiency of a multinomial logit model with only main effects (Scarpa & Rose, 2008), for which Ngene software was used (Choice Metrics, 2014). An example of a choice card is given in Appendix 1. The third part investigates the reasons for the choices made and explores tourists' opinions of Rekawa wetland and the ecotourism industry operating in this area. The final part collects the socio-economic characteristics of the participants.

Table 1: Attributes and levels of each attribute

Attributes	Levels
Number of tourists per turtle-watching tour	• 35 tourists per visit to the turtle nesting site (SQ) • 25 tourists per visit to the turtle nesting site • 15 tourists per visit to the turtle nesting site • 5 tourists per visit to the turtle nesting site
Expenditure on beach cleanup activities	• No further increase in expenditure on beach cleanup activities (SQ) • 10% increase in expenditure on beach cleanup activities • 20% increase in expenditure on beach cleanup activities
Boat trips around the Rekawa lagoon	• Boat trips without a guide (SQ) • Boat trips with a guide
Biodiversity reduction	• With no efforts the reduction in biodiversity will be 20% (SQ) • With small efforts the reduction in biodiversity will be 10% • With large efforts the reduction in biodiversity will be 5%
Rekawa wetland management fund	• LKR 0 (SQ) • LKR 250 • LKR 500 • LKR 750

	• LKR 1000 • LKR 1250 • LKR 1500

Note: SQ denotes the "status quo" condition of Rekawa at the time of the survey for each attribute.

We tested the questionnaire in face-to-face interviews with two groups of foreign tourists who were available at the TCP center. The main feedback consisted of concerns regarding the length of the questionnaire (19 pages). However, we did not reduce the length of the questionnaire as all pages were essential to explain the survey approach. Based on this feedback, we decided to collect data through valuation workshops[5]. To reduce the reading time of the questionnaire, we applied the questionnaire text in the information videos used in the workshops. Finally, we revised photos of the biodiversity attributes in the choice cards because two of the given biodiversity pictures had to be distinguished from each other.

3.2 Sampling

According to the visitor statistics maintained by the Department of Wildlife Conservation, Sri Lanka, there were 2465 foreign and 4515 domestic tourists visiting Rekawa in 2011 (Rathnayake, 2016). However, during our data collection period, most tourists visiting Rekawa coastal wetland, were foreign with a smaller share being domestic as claimed by the turtle

[5] Valuation workshops are different from personal interviews and postal mail or web-based surveys in that they gather a group of people in a room, and ask them to fill in the survey while being gathered. They allow the transmission of more information about the goods to be valued, and provide time to think about, and sometimes discuss the valuation task (MacMillan et al., 2002; MacMillan et al., 2006, Aanesen et al., 2015).

conservation project. For many foreign tourists, this is an unfamiliar ecosystem. Unfamiliar goods and services may lead to problems when it comes to economic valuation, because respondents are not well informed about the good that they are going to value (Aanesen et al., 2015). Setting up valuation workshops allows the researcher to inform respondents about the goods, and questions may be asked. At Rekawa, tourists are usually asked to wait at the TCP office, until the arrival of a turtle for nesting at the beach and this time was used to conduct the workshops. Each workshop involved two steps. First, the tourists watched two videos: one about the ecotourism potential in Rekawa coastal wetland and one on the CE survey methodology. Next, they were asked to fill in the questionnaire. Each workshop lasted 40 min, with 10 min allocated for watching the videos and 30 min to fill in the questionnaire. Between the end of August and the beginning of October 2017, we conducted 26 workshops, with 5-15 tourists, which took place between 19:00 and 23.45. Although the data collection was conducted in an off- season, by the end of data collection, we had 331 completed questionnaires (after discarding 19 incomplete or incorrectly answered questionnaires[6]).

The sample characteristics are presented in Table 2. Females constituted 54.7% of the sample, 57.1% were less than 30 years old, and one third were married. Further, 79.8% were graduates (implying they have at least 16 years of education), 64.7% were in paid-work, and about two third earned less than 4000 USD per month.

Table 2: Overview of socio-demographic variables

Characteristics	**Frequency**	**Percentage (%)**

[6] Data collection was interrupted on some evenings due to the arrival of turtles. Although, some tourists brought their incomplete questionnaires with them to the beach, only a few completed questionnaires were returned after the turtle watching.

Gender		
Male	150	45.3
Female	181	54.7
Age		
18-30 years	189	57.1
31-50 years	124	37.5
>50 years	18	5.4
Marital status		
Single	221	66.8
Married	110	33.2
Education		
Graduates	264	79.8
Non-graduates	67	20.2
Occupation		
Paid-work	214	64.7
No paid-work	117	35.3
Personal monthly income		
2000 USD or less	101	30.5
2001-4000 USD	110	33.2
4001-6000 USD	76	23
>6000 USD	44	13.3

When explaining the Rekawa wetland management fund attribute, we informed the foreign tourists that they have to pay a mandatory additional fee to "*Rekawa wetland Management Fund"*, which will be established and managed by an independent local government body. Later, in the questionnaire survey, we also asked about their preferred way of paying for suggested improvements of the wetland and to finance ecotourism development at Rekawa. They preferred taxation (n=146) to voluntary contributions (n=124). One explanation could be that there are opportunities for some tourists to avoid payments, if the finance of the work is voluntary. In contrast, a tax is compulsory and difficult to avoid paying (Ivehammar, 2009).

3.3 Model specification

3.3.1 Mixed Logit Model

The econometric basis for discrete choice data analysis is the random utility model (RUM) which assumes that the utility of a person is described by an observed systematic component and an unobserved stochastic component (McFadden, 1974). The utility of tourist *n* from alternative *i* in choice task *t* (U_{njt}) can be formulated as in (1).

$$U_{nit} = \beta X_{nit} + \varepsilon_{nit} \qquad (1)$$

where X_{nit} is a vector of observed attributes and their levels for alternative, β is a vector of attribute coefficients, and ε_{nit} is an unobserved stochastic component of the utility, which is assumed to be independently and identically distributed (iid) following the extreme value type I distribution (Gumbel).

In the multinomial logit (MNL) model, the random error needs to fulfill the iid (individually independently distributed) and IIA (independent of irrelevant alternatives) assumptions. If the latter assumption is violated, the MNL is not an appropriate model for choice data analysis. In this case, more complex models such as multinomial probit (Hausman &Wise, 1978), nested logit, or mixed logit models (Train, 1998) are required.

To allow preferences to be heterogeneous, we allow the attribute parameters to vary following a pre-specified distribution, which yields to a mixed logit (MXL) model. The vector of attribute coefficients, β_n, which is now individual-specific, where β is a common mean, and Γ is the lower Cholesky matrix with standard deviations on the diagonal and η_n represents draws from a specified distribution such as normal, log-normal, triangular, or uniform. Correlation among utility coefficients is allowed by setting the off-diagonal elements of Γ to be non-zero. (Hensher et al., 2005).

$$\beta_n = \beta_i + \Gamma\eta_n \qquad (2)$$

Assuming utility maximizing agents they will choose alternative *i* to alternative *j*, if $U_{nit} > U_{njt,}$ for all $i \neq j$, When the error terms are extreme value distributed, this implies that the difference between the two error terms is logistically distributed. The probability that alternative *i* is chosen from a set of *C* alternatives is then given by

$$P_{(i|C)} = \frac{\exp(\mu\beta_{n'}X_{nit})}{\sum_{j\epsilon C}\exp(\mu\beta_{n'}X_{nit})} \qquad (3)$$

where μ is a scale parameter, which is inversely related to the variance of the error term. As μ and β are confounded and cannot be estimated separately, within one and the same dataset, it is usual to normalize μ to 1. (Train, 2009).

In the MXL model, since the probability is conditional on the heterogeneous preferences, the probability in (3) is given as

$$P\,(i_n|X_n) = \int \prod_{t=1}^{T} \frac{\exp(\mu\beta_{n'}X_{nit})}{\sum_{j\epsilon C}\exp(\mu\beta_{n'}X_{nit})}\; f(\beta)d\beta \qquad (4)$$

where *f (β)* is a density function. The expression in (4) does not have a closed form solution and needs to be approximated using simulation averaging over D draws from the assumed distribution (Hensher et al., 2005; Revelt & Train, 1998). The simulated log-likelihood function can be represented by

$$Log\ L = \sum_{n=1}^{N} log\ \frac{1}{D}\sum_{d=1}^{D}\prod_{t=1}^{T}\frac{\exp(\mu\beta_{n'}X_{nit})}{\sum_{j\epsilon C}\exp(\mu\beta_{n'}X_{nit})} \qquad (5)$$

Model parameters are estimated based on maximum likelihood techniques. Alternative specific constant (ASC) is assumed to be fixed across respondents. We did not observe significant correlations, thus, we applied models without correlations in this paper.

To estimate how preferences for the various attributes vary with tourist characteristics such as gender, age, education, and marital status, we ran a MXL model in which choice attributes were interacted with socio-demographic variables. We extended the MXL model further by including interactions with attitudinal perceptions of the tourists towards conservation of Rekawa wetland to examine attitudinal effects on choice attributes. Further, we interacted the ASC with the socio-economic characteristics of the respondents to analyze how the choice of the status quo option depended on characteristics of the tourists.

The estimated parameters (expressing scaled marginal utilities of the attributes) can be used to compute marginal WTPs. In turn, the WTPs can be used to derive the consumer surplus of implementing specific management alternatives, i.e. specified combinations of the attribute levels. Unconditional MWTPs are calculated as follows;

$$MWTP = \frac{\beta\check{}a}{\beta c}, \forall\, a \neq c \qquad (6)$$

where $\beta\check{}\mathrm{a} = \frac{1}{R}\sum_{r=1}^{R}\beta\mathrm{a}$ is the average of R draws from the normal distribution and $\hat{\beta}_c = \frac{1}{R}\sum_{r=1}^{R}\beta_c$ is the average of R draws from the underlying normal distribution of the log-normally distributed cost coefficient. The draws were taken using the mean MWTP and its standard deviation which are computed as $\frac{\beta\mathrm{am}}{\beta\mathrm{c}}$ and $\frac{\beta\mathrm{as}}{\beta\mathrm{c}}$ where *βam* and *βas* are the mean and standard deviation of coefficient respectively and are both scaled by the scale parameter (Aanesen et al., 2018). Because scale parameters cancel out, the MWTPs can be compared directly across models. R=1000 draws were used for both non-cost and the cost parameter.

4. Results

We used both the MNL and the MXL models to estimate the preferences of foreign tourists for ecotourism development and biodiversity conservation at Rekawa wetland in Southern Sri

Lanka. The MNL model was used as the first approach, and the MXL model was used to test for the heterogeneous preferences of tourists. The models were estimated in R Studio, using the cmcR package (CMC, 2017). In the MXL model we used 1000 Halton draws and assumed a normal distribution for all non-cost attributes, a negative log-normal distribution for the cost attribute, whereas the alternative specific constant was kept fixed. Table 3 shows the results of the two models.

Table 3: Estimate results for the MNL and MXL model (standard errors in parentheses)

Estimates	**MNL model**	**MXL model**	
	Coefficient (s.e.)	**Mean (s.e.)**	**Std. dev. (s.e.)**
ASC	-1.5280 *** (0.1867)	-2.0875*** (0.2260)	
Number of tourists per turtle-watching tour	-0.0145 *** (0.0020)	-0.0252*** (0.0033)	-0.0246*** (0.0062)
Beach cleanup expenditure	0.0630 *** (0.0036)	0.1016*** (0.0074)	-0.0678*** (0.0068)
Boat trips	0.2209 *** (0.0427)	0.3117*** (0.0609)	-0.5206*** (0.1193)
Biodiversity reduction	-0.0610 *** (0.0049)	-0.0999*** (0.0097)	-0.1078*** (0.0100)
Wetland management fund	-0.0001 ** (0.0001)	-8.9936*** (0.3841)	-1.7478*** (0.1487)
N	331	331	
Number of observations	3310	3310	
Number of inter-person draws	-	1000 (halton)	
Log -Likelihood	-2106.27	-1884.89	
Adjusted Pseudo-R^2	0.19	0.27	
AIC	4224.54	3791.77	
BIC	4261.17	3858.93	

*** and ** indicate estimates significant at 1% and 5% levels respectively.

The reported results are consistent across both models having the same signs and significance levels for the estimated parameters. The exception was the wetland management fund coefficient in the MNL model, which was significant at 95% level. Statistically significant standard deviations of all random coefficients in the MXL model indicate heterogeneous preferences among tourists for the all attributes. The model fit is given by pseudo-r^2 and equaled 0.19 and 0.27 for the MNL and MIX models respectively. This is a relatively good fit for choice models, as pseudo-r^2 is often between 0.2 and 0.4 (Louviere et al., 2000). The lower LL-value, AIC, and BIC values reveal an improvement of the MXL models over the MNL model. Hence, we report the MWTP estimates and interaction terms based on the MXL model.

The alternative-specific constant of the status quo is negative and statically significant in both models (see Table 3). This implies a preference for moving away from the status quo. The status quo of Rekawa wetland is explained by Alternative 3 in each choice card. The sign of the turtle-watching group size parameter is negative, implying that the higher the number of people in the group, the less likely an alternative is chosen. Hence, tourists prefer smaller groups to larger groups. The positive sign of the boat trip attribute indicates that tourists prefer boat trips around the Rekawa lagoon with a guide compared to non-guided boat trips. The positive sign of the beach attribute indicates that tourists prefer higher expenditures on beach clean-up activities to lower. Finally, the negative sign of the biodiversity attribute indicates that tourists prefer alternatives with lower reduction in biodiversity than alternatives with higher reduction.

Table 4 presents the results of MWTP for the attributes. The MWTP estimates from the MXL model are lower and not significant. The reason is substantial heterogeneity in preferences for the various attributes, including the cost attribute, which yields large standard errors, and thus

large confidence intervals. Still, the sign of the MWTPs and their relative importance are the same in the two models. Boat trips around the Rekawa lagoon have the highest MWTP. Respondents demonstrated a WTP of 1727 LKR (11.51USD[7]) extra, if boat trips are guided compared to non-guided boat trips. Beach cleanup has the second highest MWTP, with a value equal to 493 LKR (3.29 USD), implying that tourists are willing to pay 493 LKR for a 10% increase in expenditure used on cleaning up beaches at Rekawa. Tourists are willing to pay 113 LKR (0.75 USD) extra (in addition to the normal fee) for a reduction of 10 tourists in the turtle-watching group. Finally, tourists are willing to pay 477 LKR (3.18 USD) to reduce biodiversity losses from 20% to 10% or from 10% to 5%. All the estimated mean MWTP are significant at a 90% level.

Table 4: Mean unconditional MWTP generated by the MNL model and 95% confidence intervals for the mean of each attribute (LKR/ person)

Attribute	**MWTP based on MXL (95% CI)**	**MWTP based on MNL (95% CI)**
Number of tourists per turtle-watching tour	19.74 (-66.36, 26.86)	-113** (-213, -13)
Beach cleanup expenditure	48.39 (-73.61, 170.40)	493** (937, 49)
Boat trips	135 (-196.01, 467.32)	1727* (3497, -43)
Biodiversity reduction	-24.16 (-108.05, 59.72)	-477** (-909, -45)

Note: ** and * indicates that estimates are significant at 5% and 10% respectively

In the questionnaire, we asked the respondents to rank their preferences for ecotourism and conservational activities given in the choice cards. We analyzed the ranking data using Friedman test to examine whether there is a significant difference in attributes. Test results

[7] 1 USD = 150 LKR on average during August to October 2017

revealed that there was a statistically significant difference between these attributes (χ^2 = 2975.7, df = 3, p = 0.001). Then we run post- hoc Friedman nemenyi test in R Studio using the PMCMR package (Pohlert, 2018) to find out which pairwise activities have a significant difference based on their rank sums or rank means. The results confirmed that each pair of activities has a significant difference in preferences (i.e. boat trips and turtle watching, boat trips and beach quality, boat trips and biodiversity conservation, beach quality and turtle watching, beach quality and biodiversity conservation, biodiversity and turtle watching).

Applying the MXL model, we interacted the ASC with each of the socio-demographic parameters. Except for the attribute parameters, this model yielded a few significant parameters. The only significant interaction was for education. The ASC only occurs in the SQ-alternative, and thus the negative sign of the interaction parameter demonstrates that higher educated (graduated) tourists are less inclined to choose the SQ-alternative compared to lower educated people. The results are shown in Appendix 2.

Furthermore, we ran a MXL model in which choice attributes were interacted with socio-demographic variables to estimate how the attribute preferences vary with tourist characteristics such as gender, age, education, and marital status. Most of the estimated parameters for the interaction variables were insignificant. Among the socio-demographic variables, only education and marital status could explain some of the variation in attribute preferences across the respondents. The results of the interaction models show that highly educated people (graduates) have higher preferences for extra expenditure being used on beach cleanup activities and are more adverse to large biodiversity reduction, and would like to enjoy boat trips around the lagoon without a guide relative to non-graduates. Married persons

preferred larger turtle-watching groups and guided-boat trips around the Rekawa lagoon compared to unmarried persons. These results are displayed in Appendix 3.

The turtle-watching group size attribute is of particular interest due to its potential policy implications. Hence, we inspected the effect of this attribute on respondents' utility closer by including the square of the number of tourists per turtle-watching group in the utility functions[8]. The parameter of the squared turtle-watching group size attribute tells us whether the marginal utility of the turtle-watching group size, which is negative, is diminishing or increasing as the group size decreases. Appendix 4 shows the results of this analysis. The estimated parameter of the squared turtle-watching group size is negative, indicating that the lower the group already is, the smaller is the effect on respondents' utility of further decreases in group-size. This is as expected, as it implies that there is a limit for how small groups the tourists prefer.

In addition to personal characteristics, we also tested whether tourists' attitudes towards the conservation of coastal wetlands affected their preferences for the attributes. In the questionnaire, respondents were asked to indicate the degree to which they agreed with a set of statements. Table 5 displays how tourists responded concerning plans for the conservation of Rekawa wetland.

Table 5: Distribution of tourist attitudes towards the Rekawa wetland conservation

Statement	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Do not know

[8] We thank an anonymous reviewer for this point.

Rekawa coastal wetland has an intrinsic value and we have no right to destroy it to develop ecotourism	3%	4%	7%	22%	60%	4%
Rekawa coastal wetland has an intrinsic value and we must be careful so that our ecotourism activities to the smallest possible degree destroy them	3%	2%	5%	14%	72%	4%
We do not need to take Rekawa coastal wetland into special consideration because the ecosystem itself will manage to repair any injuries caused by tourists	65%	14%	8%	4%	5%	4%
Even if I will not visit Rekawa again, the quality of the Rekawa coastal wetland should be protected and kept in good quality	2%	2%	1.5%	9.5%	81%	4%

While about 82% of the respondents agreed that "Rekawa coastal wetland has an intrinsic value and we have no right to destroy it to develop ecotourism", about 86% agreed that "Rekawa coastal wetland has an intrinsic value and we must be careful so that our ecotourism activities to the smallest possible degree destroy them". A majority of the respondents did not agree with the statement; "We do not need to take Rekawa wetland into special consideration because the ecosystem itself will manage to repair any injuries caused by tourists". Approximately 90% of the respondents agreed that "Even if I will not visit Rekawa again, the quality of the Rekawa coastal wetland should be protected and kept in good quality".

We interacted the statement "Rekawa coastal wetland has an intrinsic value and we have no right to destroy it to develop ecotourism" with each of the attributes with those who scored 5 on the Likert-scale for this statement (see MXL model A1 in Table 6). The interaction model shows that tourists who strongly agreed with this statement have stronger preferences for guided boat trips. However, their preferences for the biodiversity attribute and extra expenditure on beach cleanup activities did not differ significantly from people who did not support this statement.

Tourists who completely agreed (i.e. those who scored 5 on the Likert-scale) with the following statement "Even if I will not visit Rekawa again, the quality of the Rekawa coastal wetland should be protected and kept in good quality", demonstrated stronger preferences for hindering reduction in biodiversity and extra expenditure to be used on beach cleanup activities (see MXL model A2 in Table 6).

Table 6: Results of the MXL model including interactions with attitudes "Rekawa coastal wetland has an intrinsic value and we have no right to destroy it to develop ecotourism (A1)" and "Even if I will not visit Rekawa again, the quality of the Rekawa coastal wetland should be protected and kept in good quality (A2)"

Estimates	**MXL model (A1)**		**MXL model (A2)**	
	Mean (s.e.)	**Std. dev. (s.e.)**	**Mean (s.e.)**	**Std. dev. (s.e.)**
ASC	-1.9236*** (0.2393)		-2.0662 *** (0.2295)	
Number of tourists per turtle-watching tour	-0.0305*** (0.0058)	0.0269 *** (0.0075)	-0.0290 *** (0.0070)	0.02908*** (0.0091)
Beach cleanup expenditure	0.1022*** (0.0111)	-0.0689*** (0.0072)	0.0799*** (0.0133)	-0.0690 *** (0.0076)
Boat trips	0.1805*** (0.0880)	0.4831*** (0.1257)	0.2777*** (0.1143)	0.51978*** (0.1218)

Biodiversity reduction	-0.0960 *** (0.0144)	0.1096*** (0.0116)	-0.0437*** (0.0153)	0.1069*** (0.0113)
Wetland management fund	-8.0422*** (0.4118)	-1.6940*** (0.1932)	-8.2066*** (1.1464)	1.95348*** (0.8270)
Number of tourists per turtle -watching tour x Attitude	0.0087 (0.0066)		0.0037 (0.0075)	
Beach cleanup expenditure x Attitude	0.0025 (0.0114)		0.0318*** (0.0143)	
Boat trips x Attitude	0.2276** (0.1184)		0.0468 (0.1344)	
Biodiversity reduction x Attitude	-0.0076 (0.0159)		-0.0726*** (0.0175)	
Wetland management fund x Attitude	-9.0456 (46.7889)		-1.2302 (2.4861)	
N	331		331	
Number of observations	3310		3310	
Number of inter-person draws	1000 (Halton)		1000 (Halton)	
Log -Likelihood	-1872		- 1867.66	
Adjusted Pseudo-R^2	0.28		0.28	
AIC	3776		3767.31	
BIC	3874		3864.99	
**** and * indicates that estimates are significant at 1% and 10%				

5. Discussion

Due to the ideal conditions for turtle nesting, thousands of turtles come to Rekawa beach for egg laying every year (Ganewatta et al., 1995; Rathnayake, 2016). While this makes the beach interesting from a tourism perspective, care must be taken not to disturb the nesting activities. Therefore, habitat protection is important for turtle conservation, as large groups of tourists make the place crowded, disturb the environment, and increase littering (Juutinen et al., 2011).

Further, tourists might disturb turtles when taking photographs, as they get too close to them, touching or even climbing on them (Tisdell & Wilson, 2003). Such disturbances can result in preventing the turtles from nesting on a preferred stretch of the beach, and instead laying eggs in a less-preferred stretch of the beach, which may be more exposed for predation or inundation .Sometimes, such disturbances can also result in the turtles releasing their eggs in the sea (Heng & Clark, 1989). Therefore, unregulated turtle watching can result in turtle harassment, altering the patterns of selecting beaches for nesting, which in turn may imply decreased reproductive success. Finally, it also implies degraded beach environment by littering, campfires, and trampling of vegetation (Choi & Eckert, 2009).

According to Whaling (2017), "proposals for sea turtle tourism developments and management strategies should be considered on a case-by-case basis, in order to consider possible context-specific impacts". Read et al., (2019) conducted a pilot study on turtle-watching in New Caledonia by allowing a maximum of 45 tourists per visit, dividing them into 3 groups of 15 each at night visits and with a maximum of 45 visitors per morning visit, without dividing into groups. Their findings revealed that a majority of the tourists were satisfied with the group size of 45 irrespective of the time of the turtle-watching tour. Considering both economic and environmental aspects of *in-situ* conservation of turtles, currently, turtle-watching groups in Rekawa are set up with 35 tourists per group. Our findings reveal that respondents prefer and are willing to pay for smaller groups which is consistent with the findings of Juutinen et al., (2011) whereby an increase in the number of tourists causes negative effects on respondent welfare. However, in our study the group size preference is heterogeneous and unmarried people are willing to pay more for smaller turtle-watching groups. Conversely, married people tend to prefer larger groups, although not larger than the current group size of 35. This may be due to the possibility of being in the same group with their family members.

Beach littering reduces the aesthetic value of beaches and discourages tourists from visiting (Ballance et al., 2000). Cleanliness is identified as the most crucial factor in influencing beach users' choice and previous studies have shown that foreign tourists are prepared to spend more money to enjoy clean beaches (Ballance et al., 2000). In line with their findings, we found that foreign tourists are willing to pay for increased beach cleanup activities. Further, our results indicate heterogeneous preferences in this respect, and those with higher education tend to have a higher preference for extra expenditure used on beach cleanup activities compared to those with a lower education. A possible explanation is that people with a higher level of education have more knowledge about the effects of beach littering on the coastal environment.

Tourists are willing to pay extra for guided boat trips compared to the current unguided boat trips. This may be due to the higher safety and security in guided tours (Wight, 2001), in addition to the possibility of receiving information about the surrounding environment. In general, it has been shown that tourists are willing to pay considerable amounts for tours that include specialized information about the flora and fauna at the destination (Kularatne, 2017). Providing wildlife information not only increases tourist satisfaction, but also strengthens their attitudes towards nature conservation (Kularatne, 2017). Roberts et al., (2014) found that guided interpretation[9] is more effective compared to non-guided interpretation in terms of tourists' satisfaction.

[9] "Interpretation is an educational activity which aims to reveal meaning and relationships through the use of original objects, by first-hand experience, and by illustrative media, rather than simply to communicate factual information". (Tilden, 1977, p. 8). Wearing et al., (2007) split interpretation into two groups based on delivery technique: 'guided' (e.g. guided walks) and 'non-guided' (e.g. boards).

Kiss (2004) argues that while ecotourism is a good land use pattern for biodiversity protection, it is not as effective as pure conservation. Carlsson et al., (2003) found that biodiversity was one of the highest valued attributes in wetland management by the population living close to the studied wetland. When the ecosystem is rich in biodiversity, domestic visitors do not value further biodiversity enrichment, but are concerned if there is a decline in biodiversity (Juutinen et al., 2011). In contrast, foreign tourists place almost the same value on both increases and decreases in biodiversity (Juutinen et al., 2011). In our study, the biodiversity reduction attribute was significant and higher reduction in biodiversity negatively affected the welfare of foreign tourists, supporting Juutinen et al., (2011).

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The fact that the CE asks for contributions to a fund for future management and improvements of Rekawa wetland, combined with a large share (98%) of informants stating that they do not intend to return, implies that the elicited values can be interpreted as non-use values. This is because, most of the participants do not expect to experience the improved situation in Rekawa, for which their contribution is intended. Alternatively, for those intending to return, the elicited values can be regarded as option values. Such an interpretation is supported by the attitudinal questions which revealed that a majority of tourists are highly concerned about the protection and conservation of the Rekawa coastal wetland, even if they do not intend to return. For example, approximately 90% agreed (or strongly agreed) with the statement "Even if I will not visit Rekawa again, the quality of the Rekawa coastal wetland should be protected and kept in good quality". In an earlier survey, Gunawardena & Rowan (1995) used the contingent valuation method with an open-ended approach to quantify the option and non-use (existence and bequest) values of the Rekawa mangrove ecosystems among households in Rekawa community. The existence, bequest and option value presented in their study (2.6 USD/ha/year) is probably an underestimate of the total existence value. The reason is that they did not include

broader conservation aspects such as conservation of habitats for sea turtles and biodiversity, which we have demonstrated are important non-use values, at least for tourists.

We collected data only from foreign tourists due to the unavailability of domestic tourists to Rekawa site during our data collection period, which coincided with the domestic off-season for turtle watching. However, we acknowledge that it is required to collect information from both domestic tourists and the local communities in addition to foreign tourists, to elicit preferences for development of tourisms facilities and biodiversity conservation, to have a comprehensive picture of tradeoffs in Rekawa. Future research should try to address this limitation.

Our main focus in the project, which the survey is part of, and when formulating the survey, has been to inform national and local managers in Sri Lanka and at Rekawa, regarding preferences of tourists when it comes to destination attributes. Admittedly, applying more advanced statistical models, like the hybrid MNL, may have revealed also latent preferences among the respondents concerning Rekawa ecotourism development. However, when formulating the survey, this option was not taken into consideration, and thus we lack variables to use to reveal this type of underlying preferences. In addition, this may be of larger interest if we had included both foreign and domestic tourists. For now, we have mentioned this as an idea for future research.

6. Conclusion and managerial implications

This study investigated foreign tourist preferences and WTP for biodiversity protection and ecotourism development in a coastal wetland in Southern Sri Lanka using a CE. We found that most tourists preferred to be in small groups for turtle-watching. This is an indication to

managers of turtle-watching at Rekawa, to reduce the current group size as this may enable them to command higher prices for this activity. However, keeping family members and friends in the same group is required as married people prefer to be in large groups compared to unmarried people.

Marine litter has been widely recognized as one of the major environmental issues. This is an issue, caused by discarding consumer items such as plastic or glass bottles, beverage cans, cigarettes, food wrappers, straws, and fishing gear debris either at the beach or in the sea. Finding an effective solution to the causes and effects of this environmental problem is challenging. Tourist WTP for beach cleanup activities indicates the importance of taking actions to clean the beaches regularly. Initially, preventing marine litter from entering the coastal environment is the most effective way to reduce and mitigate the harmful effects of this environmental problem. There are many practical solutions, including improved waste management systems, educational and outreach programs, anti-dumping campaigns, and reducing losses of fishing gear at sea. Considering our study location, we suggest several activities such as displaying sign boards, establishing waste bins, and organizing beach cleanup activities with the local community as social events to keep the Rekawa beach clean.

Existing boat trips operated by lagoon fishers should be upgraded by providing the services of an educated guide. The results of Kularatne (2017) also demonstrate how the provision of trained interpreters who offer insights and diversity about the tour is an important factor to improve tourist experiences. Tourists indicated they are willing to pay more if there is a guide in the boat compared to the current boat service without a guide. Currently, there are no trained tour guides at Rekawa for this task. This can be seen as an opportunity for educated, young

people at Rekawa to provide a quality service to tourists during boat trips, thus earning income and becoming self-sufficient.

The conflict between tourism development and biodiversity conservation is complicated due to the lack of knowledge pertaining to how tourism activities affect biodiversity. Therefore, during boat trips, we propose to make tourists aware of biodiversity facts and information about Rekawa coastal wetland, and of how appropriate tourist behavior contributes to conserving biodiversity. Tourists should also be told not to disturb wildlife while enjoying nature. In the case of Rekawa coastal wetland, foreign tourists have a positive perception of biodiversity conservation. Thus, economic benefits arising from ecotourism should be used for conservation and programs to promote biodiversity, to ensure habitat protection for a broad set of species. In conclusion, conservation of biodiversity plays a significant role in securing long-term sustainability of the ecotourism industry in Rekawa wetland.

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Appendix 1:

Questionnaire

Balancing conservation goals and ecotourism development in Rekawa coastal wetland management: a choice experiment

Hello. We are collecting data for a PhD study in Economics at UiT-The Arctic University of Norway in collaboration with University of Ruhuna, Sri Lanka. We ensure that your answers will be used for research purposes only. Would you please take part in the survey? ☺

Part A: Rekawa coastal wetland- background information and current status of ecotourism

Rekawa coastal belt is a section of the Southeast Sri Lankan coastline, which is located in Hambantota district of the Southern province about 200 km away from Colombo.

Source: Google image

The area is composed of a variety of coastal, terrestrial, and wetland habitats. It is rich in biodiversity due to the presence of mangroves along with Rekawa lagoon, coral reefs and five species of globally threatened marine turtles in nearby coastal waters. About 37 fish species, 9 crustacean species, and 104 bird species (including 15 migrants) have been recorded in the lagoon environment (IUCN, 2006). There is a shallow fringing reef about 100-150 m wide and 300 m long which is located in off the northeastern side of the Rekawa headline. Thirty five species of stony corals and 138 species of reef and reef associated fish have been recorded from this reef ecosystem.

Although Rekawa has a potential for nature-based tourism, it has not been fully achieved yet. Currently this destination is famous among the tourists only for turtle watching. In 2006, Department of Wildlife Conservation in Sri Lanka declared the 4 km stretch of Rekawa beach as a sanctuary to conserve marine turtles. A few inland fishers have been providing outrigger canoeing trips for tourists to enjoy the natural beauty around the Rekawa lagoon. Clean sandy beaches are very attractive for tourists for sun-bathing. Swimming, snorkeling, and diving are some of the water sports tourists can do here for coastal recreational activities.

a) How often do you visit Rekawa coastal wetland? (Mark your answer in the box)

- Once in a lifetime ☐
- Every few years ☐
- Several times per year ☐
- Once in a year ☐

b) If you have visited Rekawa more than once, how many times have you visited Rekawa?……

c) When you visit Rekawa, how long do you usually stay?

No: of days: …… or No: of hours: ……

d) Would you like to visit Rekawa again in the future?

- Yes ☐
- No ☐
- I do not know ☐

e) Do you choose to visit Rekawa purposely or randomly as part of your trip?.....

If you select Rekawa purposely, is it your

- Sole/ primary destination ☐
- One of multiple destinations in the trip plan ☐

f) What is your major reason for visiting Rekawa?

- For turtle-watching ☐
- For education & research purposes ☐
- For a holiday ☐
- For beach recreation ☐
- Other ☐
  (Please specify)…….

g) What types of recreational activities, other than turtle watching, would you like to experience at this destination?.....

Part B: Choice cards

We would like to present a few so-called choice cards to elicit your preferences regarding characteristics of and activities at Rekawa. First, we would like to explain the details of a choice card.

A: Number of tourists per turtle-watching tour

Rekawa beach provides habitats for five out of seven species of marine turtles in the world. Habitat protection is essential to conserve marine turtles. This could be done by limiting the access to beaches where nesting activities are high. Considering both economic and environmental aspects of *in-situ* conservation of turtles, on average 35 tourists per visit is appropriate. The enlargement of group size increases crowd, disturbance for egg laying process, and littering. On the other hand, some tourists prefer to be in large groups as this increases the possibility to meet and exchange information with like-minded people. Thus, alternative levels for turtle watching would be:

- 35 tourists per visit to the turtle nesting site
- 25 tourists per visit to the turtle nesting site
- 15 tourists per visit to the turtle nesting site
- 5 tourists per visit to the turtle nesting site

B: Expenditure on beach cleanup activities

The Rekawa coast provides opportunities for tourists to engage in coastal recreational activities such as sun-bathing, swimming, snorkeling, and diving. At present, there are no regular beach cleanup activities to keep the Rekawa beach clean for coastal recreational activities. Natural debris and man-made pollutants such as polythene, plastics, and glass bottles are accumulated on the beaches. However, if more expenditure is used on beach cleanup activities, the expected pollutants on Rekawa beach can be reduced. Therefore, we assume the following levels of expenditure on beach cleanup activities:

- No further increase in expenditure on beach cleanup activities
- 10% increase in expenditure on beach cleanup activities
- 20% increase in expenditure on beach cleanup activities

C: Boat trips around the Rekawa lagoon

In spite of being a lagoon, Rekawa is shallow brackish water estuary, which receives freshwater from Kirama Oya is connected to the sea through two outlets. The presence of mangroves and scrub forest surrounding the lagoon provide habitats for many species, including birds. Further, it acts as breeding grounds for fish and shrimp. At present, non-

guided boat trips are available at Rekawa. However, to facilitate the tourists and make them aware about the natural ecosystems around the lagoon, guided boat trips can be operated. Therefore, alternative levels for boat trip around the lagoon would be:

- Boat trips without guide
- Boat trips with guide

D: Biodiversity

Rekawa coastal wetland is rich in biodiversity due to the presence of mangroves surrounding the Rekawa lagoon, coral reefs, and five species of globally threatened marine turtles in nearby coastal waters. Experiencing diverse nature is an important part of a visit for many tourists. Nevertheless, disturbances arising from recreational and tourism activities may adversely affect biodiversity.

For our study we shall adopt the following definition of biodiversity. "The number of different species of plants, animals, their population levels, the number of different habitats, and their sizes" (Birol *et al*., 2006). If no efforts are taken, the present level of biodiversity is expected to fall by 20% due to the development of infrastructure facilities for increased tourism. However, Rekawa community may take special efforts to protect natural habitats and improve the biodiversity. We assume the following levels of biodiversity:

- With no efforts the reduction in biodiversity will be 20%
- With small efforts the reduction in biodiversity will be 10%
- With large efforts the reduction in biodiversity will be 5%

E: Rekawa wetland management fund

Conserving the environment, provision of safety and security as part of eco-tourism promotion at Rekawa coastal wetland require financial resources. Tourists would have to pay their share of the costs, if they want to enjoy the ecotourism benefits arising from wetland conservation. In order to protect the Rekawa coastal wetland and promote eco-tourism, you have to pay an additional fee to "*Rekawa wetland Management Fund"*, which will be established and managed by an independent local government body. Efforts to improve the characteristics above may be implemented, only if enough revenue is generated. The following fee levels are realistic for the mentioned efforts:

- LKR 0 (when nothing is done)
- LKR 250
- LKR 500

- LKR 750
- LKR 1000
- LKR 1250
- LKR 1500

Example of a choice card (Do not need filling out)

Below you can find 10 choice cards each with 3 alternatives. We ask you to consider whether you prefer alternative 1, alternative 2 or alternative 3. Alternatives 1 and 2 imply efforts to improve environmental characteristics and increase services for tourists at Rekawa under wetland conservation activities. Such efforts and increase in services, however, come only at additional costs, i.e. you have to pay an additional fee. Alternative 3 remains the same in all ten choice cards and no extra fee is charged as there is no extra effort for Rekawa wetland management.

Alternative 1:

If you prefer alternative 1, you have a group of 5 tourists at turtle watching and can engage in coastal recreational activities along the beaches where expenditure on beach cleanup is increased by 20% from the current level. You can enjoy guided boat trips around the Rekawa lagoon. With large efforts the reduction in biodiversity is limited to 5% as compared to 20% without any efforts. For this management scenario, you have to pay an additional fee equal to LKR 1000.

Alternative 2:

If you prefer alternative 2, you have a group of 15 tourists at turtle watching and can engage in coastal recreational activities along the beaches where expenditure on beach cleanup is increased by 10% from the current level. You can enjoy non-guided boat trips around the Rekawa lagoon. With small efforts the reduction in biodiversity is limited to 10%, as compared to 20% without any efforts. For this management scenario you have to pay an additional fee equal to LKR 500.

Alternative 3:

Alternative 3 is today's situation, characterized by groups of 35 tourists at turtle watching, no further expenditure on beach cleanup, non-guided boat trips around the Rekawa lagoon, and an expected fall in biodiversity at 20%. On the other hand, with no additional efforts you will not need to pay an additional fee.

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	5 tourists per visit 	15 tourists per visit 	35 tourists per visit 
Expenditure on beach clean-up activities	20% increase in expenditure on beach cleanup activities 	10% increase in expenditure on beach cleanup activities 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips with guide 	Boat trips without guide 	Boat trips without guide 
Biodiversity	With large efforts the reduction in biodiversity will be 5% 	With small efforts the reduction in biodiversity will be 10% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 1000 	LKR 500 	LKR 0
I would prefer			

Choice card 1:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching Tour	5 tourists per visit 	35 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	10% increase in expenditure on beach cleanup activities 	10% increase in expenditure on beach cleanup activities 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips with guide 	Boat trips without guide 	Boat trips without guide 
Biodiversity	With large efforts the reduction in biodiversity will be 5% 	With no efforts the reduction in biodiversity will be 20% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 1000 	LKR 500 	LKR 0
I would prefer			

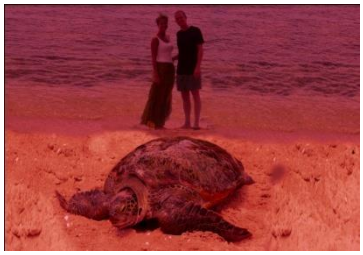
Choice card 2:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	15 tourists per visit 	15 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	10% increase in expenditure on beach cleanup activities 	No regular beach cleanup 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips without guide 	Boat trips with guide 	Boat trips without guide 
Biodiversity	With small efforts the reduction in biodiversity will be 10% 	With small efforts the reduction in biodiversity will be 10% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 500 	LKR 1000 	LKR 0
I would prefer			

Choice card 3:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	15 tourists per visit 	15 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	No regular beach cleanup 	10% increase in expenditure on beach cleanup activities 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips without guide 	Boat trips with guide 	Boat trips without guide 
Biodiversity	With small efforts the reduction in biodiversity will be 10% 	With no efforts the reduction in biodiversity will be 20% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 750 	LKR 750 	LKR 0
I would prefer			

Choice card 4:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	35 tourists per visit 	5 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	20% increase in expenditure on beach cleanup activities 	No regular beach cleanup 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips with guide 	Boat trips without guide 	Boat trips without guide 
Biodiversity	With small efforts the reduction in biodiversity will be 10% 	With small efforts the reduction in biodiversity will be 10% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 750 	LKR 750 	LKR 0
I would prefer			

Choice card 5:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	15 tourists per visit 	25 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	No regular beach cleanup 	20% increase in expenditure on beach cleanup activities 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips with guide 	Boat trips without guide 	Boat trips without guide 
Biodiversity	With large efforts the reduction in biodiversity will be 5% 	With no efforts the reduction in biodiversity will be 20% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 500 	LKR 1000 	LKR 0
I would prefer			

Choice card 6:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	5 tourists per visit 	35 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	10% increase in expenditure on beach cleanup activities 	10% increase in expenditure on beach cleanup activities 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips without guide 	Boat trips with guide 	Boat trips without guide 
Biodiversity	With no efforts the reduction in biodiversity will be 20% 	With large efforts the reduction in biodiversity will be 5% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 1500 	LKR 250 	LKR 0
I would prefer			

Choice card 7:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	25 tourists per visit 	5 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	20% increase in expenditure on beach cleanup activities 	No regular beach cleanup 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips without guide 	Boat trips with guide 	Boat trips without guide 
Biodiversity	With large efforts the reduction in biodiversity will be 5% 	With no efforts the reduction in biodiversity will be 20% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 1000 	LKR 500 	LKR 0
I would prefer			

Choice card 8:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	5 tourists per visit 	25 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	20% increase in expenditure on beach cleanup activities 	No regular beach cleanup 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips with guide 	Boat trips without guide 	Boat trips without guide 
Biodiversity	With no efforts the reduction in biodiversity will be 20% 	With large efforts the reduction in biodiversity will be 5% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 250 	LKR 1250 	LKR 0
I would prefer			

Choice card 9:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	25 tourists per visit 	15 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	No regular beach cleanup 	20% increase in expenditure on beach cleanup activities 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips without guide 	Boat trips with guide 	Boat trips without guide 
Biodiversity	With no efforts the reduction in biodiversity will be 20% 	With small efforts the reduction in biodiversity will be 10% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 250 	LKR 1500 	LKR 0
I would prefer			

Choice card 10:

Attributes	**Alternative 1**	**Alternative 2**	**Alternative 3 (Same as today)**
Number of tourists per turtle-watching tour	35 tourists per visit 	5 tourists per visit 	35 tourists per visit 
Expenditure on beach cleanup activities	No regular beach cleanup 	20% increase in expenditure on beach cleanup activities 	No regular beach cleanup 
Boat trips around the Rekawa lagoon	Boat trips with guide 	Boat trips without guide 	Boat trips without guide 
Biodiversity	With no efforts the reduction in biodiversity will be 20% 	With large efforts the reduction in biodiversity will be 5% 	With no efforts the reduction in biodiversity will be 20% 
Rekawa wetland management fund	LKR 1250 	LKR 250 	LKR 0
I would prefer			

Part C: Reasons for the choices you made and attitudes towards Rekawa ecotourism

C1. Rank the ecotourism activities and conservational aspects given at the choice cards according to your choice/preference.

- Turtle watching
- Beach quality for recreational activities
- Boat trips around the lagoon
- Biodiversity conservation

C2. Please indicate how important you find the following attributes in making your choice of alternatives on the choice cards. (Please mark one cross for each attribute)

Attribute	**Very important**	**Important**	**Neither important nor not important**	**Not important**	**Not important at all**	**Do not know**
Number of tourists per turtle-watching tour						
Expenditure on beach cleanup activities						
Boat trips around the Rekawa lagoon						
Biodiversity						
Rekawa wetland management fund						

C3. Which of the following statements correspond the most to your opinion towards tourism at Rekawa coastal wetland?

How strongly do you agree/ disagree with the following statements.
1= complete disagreement, 5=complete agreement (one cross for each statement)

a) Rekawa coastal wetland has an intrinsic value and we have no right to destroy it to develop ecotourism.

1	2	3	4	5	Do not know
◯	◯	◯	◯	◯	◯

b) Rekawa coastal wetland has an intrinsic value and we must be careful so that our ecotourism activities to the smallest possible degree destroy them.

1	2	3	4	5	Do not know
◯	◯	◯	◯	◯	◯

c) We need to consider intrinsic value of Rekawa coastal wetland when we enjoy the ecotourism, but we must also accept that some of them are lost because of our ecotourism activities.

1	2	3	4	5	Do not know
◯	◯	◯	◯	◯	◯

d) Rekawa coastal wetland is a part of nature, and we have the right to use the nature in order to get the utility in the form of ecotourism even though this means that this ecosystem is partly destroyed.

1	2	3	4	5	Do not know
◯	◯	◯	◯	◯	◯

e) We do not need to take Rekawa coastal wetland into special consideration because the ecosystem itself will manage to repair any injuries caused by tourists.

1	2	3	4	5	Do not know
◯	◯	◯	◯	◯	◯

f) Even if you will not visit Rekawa again, quality of the Rekawa coastal wetland should be protected and kept in good quality.

1	2	3	4	5	Do not know
◯	◯	◯	◯	◯	◯

g) The money asked for in the choice cards will be sufficient to develop and keep ecotourism at Rekawa at a satisfactory level?

1	2	3	4	5	Do not know
◯	◯	◯	◯	◯	◯

C4. How likely do you think it is that results of this survey will be used by relevant authorities to develop sustainable ecotourism at Rekawa coastal wetland?
1= completely unlikely, 5= very likely (one cross please)

1	2	3	4	5	Do not know
◯	◯	◯	◯	◯	◯

C5. If you had to contribute to finance the work of conservation and promoting ecotourism, how would you prefer to pay? (one cross please)

◯ As a part of a general tax on goods and services at tourism (VAT)

◯ Through the market, by paying more for goods and services offered by local businesses

◯ Voluntary payment which go to a government fund for coastal environmental protection

Part D: Personal information

D1. Gender of the respondent: ☐ Male ☐ Female

D2. Age: _____years

D3. Where are you from?

- Foreigners please name your country: ……
- For locals please name your home town: ……

D4. Marital status:

☐ Married

☐ Single

D5. The highest level of education you have completed.

☐ No formal education
☐ Primary
☐ Secondary
☐ Technical diploma
☐ Bachelor's degree
☐ Postgraduate degree

D6. What is your occupation?

☐ Civil servant
☐ Self-employed/ Own business
☐ Private employee
☐ Student
☐ Homemaker/ House wife (unpaid)
☐ Retired
☐ Other: please specify …….

D7. Your personal monthly income before tax reduction or social security contribution:

☐ >7000 USD
☐ 6001-7000 USD
☐ 5001-6000 USD
☐ 4001-5000 USD
☐ 3001-4000 USD
☐ 2001-3000 USD
☐ 1001-2000 USD
☐ <1000 USD

Thank you for your help!

Appendix 2: Results of MXL model estimate for interactions between ASC and socio-demographic factors (standard errors in parentheses)

Estimates	**MXL model**	
	Mean (s.e.)	**Std. dev. (s.e.)**
ASC	-2.4353*** (1.2169)	1.4071*** (0.4183)
Number of tourists per turtle-watching tour	-0.0257*** (0.0035)	-0.0242*** (0.0062)
Beach cleanup expenditure	0.1039*** (0.0080)	-0.0680*** (0.0065)
Boat trips	0.3201*** (0.0626)	-0.5082*** (0.1220)
Biodiversity reduction	-0.1021*** (0.0103)	-0.1103*** (0.0120)
Wetland management fund	-9.3796*** (0.4764)	-2.0365 ******* (0.1875)
ASC x age 1	0.1875 (1.0887)	
ASC x age 2	-0.0615 (1.1546)	
ASC x female	-0.4525 (0.5459)	
ASC x married	0.5403 (0.4450)	
ASC x graduate	-1.3634*** (0.5603)	
ASC x paid-work	0.3780 (0.5200)	
ASC x income 1	0.4576 (0.6187)	
ASC x income 2	0.1652 (0.5907)	
ASC x income 3	0.3474 (0.6711)	
N	331	
Number of observations	3310	
Number of inter-person draws	1000 (Halton)	
Log -Likelihood	-1873.42	
Adjusted Pseudo-R^2	0.28	
AIC	3788.84	
BIC	3917.04	
*** indicates that estimates are significant at 1%		

Appendix 3: Results of MXL model estimate for socio-demographic variables; education and marital status (standard errors in parentheses)

Table A: Results of MXL model including interactions with respondents' education

Estimates	**MXL model**	
	Mean (s.e.)	**Std. dev. (s.e.)**
ASC	-2.1298***	
	(0.2138)	
Number of tourists per turtle-watching tour	-0.0260***	0.0274***
	(0.0062)	(0.0057)
Beach cleanup expenditure	0.0854***	-0.0689***
	(0.0119)	(0.0065)
Boat trips	0.5132***	-0.5216***
	(0.1306)	(0.1190)
Biodiversity reduction	-0.0565***	0.1077***
	(0.0148)	(0.0103)
Wetland management fund	-8.4721***	1.9512***
	(0.2369)	(0.1310)
Number of tourists per turtle-watching tour x graduates	0.0001	
	(0.0071)	
Beach cleanup expenditure x graduates	0.0254***	
	(0.0126)	
Boat trips x graduates	-0.2465**	
	(0.1458)	
Biodiversity reduction x graduates	-0.0580***	
	(0.0168)	
Wetland management fund x graduates	-0.7965***	
	(0.2825)	
N	331	
Number of observations	3310	
Number of inter-person draws	1000 (Halton)	
Log -Likelihood	-1871	
Adjusted Pseudo-R^2	0.28	
AIC	3774	
BIC	3871	

*** and ** indicates that estimates are significant at 1% and 5%, respectively

Table B: Results of MXL model including interactions with respondents' marital status

Estimates	**MXL model**	
	Mean (s.e.)	**Std. dev. (s.e.)**
ASC	-2.1096*** (0.2276)	
Number of tourists per turtle-watching tour	-0.0279*** (0.0041)	0.0226 *** (0.0066)
Beach cleanup expenditure	0.1043 *** (0.0086)	0.0664 *** (0.0067)
Boat trips	0.2278 *** (0.0682)	0.4776 *** (0.1198)
Biodiversity reduction	-0.0995*** (0.0115)	-0.1068 *** (0.0104)
Wetland management fund	-9.6826*** (0.6307)	-2.0065 (0.2601)
Number of tourists per turtle-watching tour x married	0.0098** (0.0061)	
Beach cleanup expenditure x married	-0.0100 (0.0115)	
Boat trips x married	0.2581** (0.01343)	
Biodiversity reduction x married	0.0015 (0.0155)	
Wetland management fund x married	0.7046*** (0.2719)	
N Number of observations Number of inter-person draws Log -Likelihood Adjusted Pseudo-R^2 AIC BIC	331 3310 1000 (Halton) -1881 0.27 3795 3893	
*** and ** indicate that estimates are significant at 1% and 5% respectively		

Appendix 4: Results of MXL model estimate for non-linear effects of number of tourists per turtle-watching group

Estimates	**MXL model**	
	Mean (s.e.)	**Std. dev. (s.e.)**
ASC	-1.5341*** (0.2332)	
Number of tourists per turtle-watching tour	0.0765** (0.0393)	-0.0387*** (0.0063)
Squared Number of tourists per turtle-watching tour	-0.0028*** (0.0010)	
Beach cleanup expenditure	0.1268*** (0.0094)	0.0825*** (0.0071)
Boat trips	0.4974*** (0.0759)	0.6700*** (0.1223)
Biodiversity reduction	-0.1158*** (0.0125)	-0.1372*** (0.0117)
Wetland management fund	-0.0005*** (0.0001)	0.0017*** (0.0002)
N Number of observations Number of inter-person draws Log -Likelihood Adjusted Pseudo-R^2 AIC BIC	331 3310 1000 (Halton) -1861.20 0.28 3746.41 3819.66	
*** and ** indicate that estimates are significant at 1% and 5% respectively		