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Prospective tourist preferences for sustainable tourism development in Small Island Developing States

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Abstract

Tourism development is crucial for economic growth in Small Island Developing States, but its management involves trade-offs between ecosystem services and social and cultural identities. This paper aims to contribute to the debate around the achievement of the Sustainable Development Goals through an investigation of the sustainable management of tourism and coastal ecosystem services. The paper presents a choice experiment and latent factor analysis to disentangle relevant aspects of sustainable tourism in Small Island Developing States for potential visitors. Willingness to pay is reported for the different factors revealing preferences variability for previous and prospective visitors. Pro-environmental attitudes influence individual tastes and policy makers should consider these traits in order to attract visitors and private funding. Our findings show that prospective tourists are interested in the wider aspects of the tourism experience which in turn require the careful management of social and environmental resources in Small Island Developing States.

1. Introduction

Distinct cultural heritage and a unique natural environment are some of the comparative advantages of Small Island Developing States (SIDS), which attract large numbers of visitors every year (UNWTO, 2012, 2020). Having recognised the potential contribution of tourism to economic growth and employment generation, and due to limited opportunities for economic diversification, SIDS communities have tried to encourage tourism as a development alternative (Bojanic and Lo, 2016; Pratt, 2015; Seetanah, 2011; Schubert et al., 2011). However, the negative social and environmental effects of the tourism industry have been increasingly recognised (Gössling, 2002; Neto, 2003; Buckley, 2012; Pan et al., 2018). Habitat loss in SIDS coastal areas due to tourism development is a major threat for mangroves, estuaries, reefs and foreshore ecosystems (Bernard and Cook, 2015). In addition, if on the one side, tourism can positively influence the socio-cultural context in host countries for example through hosts-guests interaction (Das and Chatterjee, 2015), on the other side it can threaten heritage, cultural identity and wellbeing (Coria and Calfucura, 2012; Pan et al., 2018; Pratt et al., 2016; Woo et al., 2015; Sharpley, 2014). Efforts to promote the sustainability of the tourism sector have long been advocated in policy and research circles (UNWTO, 2017; Buckley, 2012; UNWTO, 2012). Despite SIDS vulnerability to environmental and economic shocks (Scandurra et al., 2018) and their often over-reliance on tourism (Schubert et al., 2011; Narayan, 2010), this sector, when sustainably managed, has the potential to make a significant contribution towards the achievement of a range of Sustainable Development Goals (SDGs) (UN, 2015). Sustainable tourism, for example, could be part of a national strategy to conserve SIDS marine and terrestrial habitats and biodiversity (SDGs 14 and 15), particularly the iconic coral reefs. It could also promote more resilient urban planning, while safeguarding cultural and national heritage (SDG 11). Policies that promote sustainable tourism may in turn create new jobs (SDG 8) and help reduce inequalities (SDG 10). Sustainable tourism should therefore be seen as an opportunity for SIDS to enhance their economic growth, but also provide biodiversity protection, and promote and conserve local culture.

Nonetheless, a strategy to promote more sustainable tourism development faces several challenges and will involve complex economic, environmental and social policy trade-offs (UNWTO, 2012; Pan et al., 2018). Moreover, increased financial aid to support this process is needed, especially in SIDS and developing countries. This increase may take the form of Official Development Assistance (ODA), a country-to-country transfer of funds, or private investments and expenditures. Therefore, if tourism sustainability targets are to be achieved, an evidence base, which includes information on the existence and magnitude of the values and positive preferences of potential prospective tourists, is an important pre-requisite to enable policy processes.

Research on preferences and values for sustainable tourism development in remote areas by prospective tourists has been limited, and widely focused on biodiversity and ecosystems conservation (e.g., Navrud and Strand, 2018; Morse-Jones et al., 2012; Rolfe et al., 2000). Studies that systematically assess the trade-offs between environment, cultural heritage and tourism management options are rare and missing for SIDS. Accordingly, the main objective of this research is to fill this gap in the literature and measure the latent factors and willingness-to-pay (WTP) for sustainable tourism development in SIDS by prospective tourists, with a focus on coastal and marine ecosystems. Our case study focuses on Fiji because this is one of the most tourism-dependent SIDS in the world (Narayan et al., 2010). We developed and remotely administered a survey to a sample of UK residents. The survey included a choice experiment (CE) and attitudinal and behavioural questions to reveal the preferences and WTP trade-offs. The key feature of our CE is to systematically account for habitats protection, cultural values preservation, and tourism industry management. At the same time, the analysis of attitudinal and preference questions describes the main traits of prospective visitors, revealing respondents' preferences, past experience, environmental beliefs, ecotourism attitudes, pro-environmental behaviours and how these are potentially interlinked. Methodologically, we jointly model choice experiment and latent factor data and provide a more comprehensive understanding of the challenges and opportunities related to sustainable development strategies for SIDS. The paper has three main aims: (*i*) determine the value attached to sustainable tourism initiatives in remote destinations, such as SIDS, (*ii*) disentangle the trade-offs between sustainability dimensions (environmental, economic and social), and (*iii*) assess the influence of latent factors (individual experience, attitudes and beliefs) that characterise the potential visitors' preferences.

The results are particularly relevant to gaining a better understanding of how sustainable tourisms can help in the attainment of the SDGs and how policy decision makers can prioritize resources to restore and maintain iconic habitats (SDGs 14,15), heritage and cultural identity (SDGs 10, 11), and promote a more sustainable tourism industry (SDGs 8, 10).

2. Background

UNEP and UNWTO (2005) define sustainable tourism as "Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities". Tourism sustainability has long been debated by policymakers and practitioners (UNWTO, 1997; Buckley, 2012; Ruhanen et al., 2015). However, it is during the last two decades that policy and practical initiatives have proliferated globally, and that the crucial role of tourism in sustainable development has been fully acknowledged (UNWTO, 2017). Nowadays, sustainability in tourism is a paradigm characterising the future of the sector and is

reflected in a variety of practices such as ecotourism, nature-based tourism, heritage tourism, community tourism, and rural tourism (Pan et al., 2018).

Similarly, public policy interest in the strong tie between tourism and sustainable growth in SIDS has only recently gained international prominence in the light of increasing concerns over their vulnerability (UNWTO, 2012). This debate has been further promoted through the SIDS Accelerated Modalities of Action (SAMOA) Pathway agreement (UN, 2014)[1] resulting in several initiatives. In the Pacific area, for example, the recognition of the benefits stemming from local communities' involvement in natural resources management has led to the creation of several Community Conserved Areas and Locally Managed Marine Areas (Govan et al., 2009). In Fiji, experiences of community-based environmental management evolved in Marine Conservation Agreements between tourism operators and local communities, aimed at preserving biodiversity and cultural heritage, whilst providing revenues and employment opportunities (Mangubhai et al., 2020). However, the success of sustainable tourism initiatives in SIDS critically depends on the availability of financing schemes, including international official development assistance funds and foreign direct investments. International financing has played a central role in supporting sustainable development and tourism in SIDS (UNDP, 2015; Witter, 2011; Barrowclough, 2007; Craigwell and Moore, 2008). However, resources for development funding have been consistently shrinking (UNEP, 2014). Therefore, decision makers need to tackle two issues: explore new financing mechanisms and potential markets, and be more efficient in allocating the scarce resources to protect the local economy, society and the fragile environment.

Evidence on the preferences of potential visitors and donors could support decision makers in this task. Stated preferences methods, particularly CEs, have been specifically applied to determine tourists' preferences towards nature-based ecotourism, and sustainable tourism development in developing countries. However, only a few studies explored the values that prospective tourists place on sustainable tourism development and ecosystem services protection in the context of remote areas (Morse-Jones et al., 2012; Swanson and Kontoleon, 2004; Kontoleon and Swanson, 2003; Kramer and Mercer, 1997; Rolfe et al., 2000; Svedsäter, 2000; Horton et al., 2003; Navrud and Strand, 2018; Huybers and Bennet, 2000). Moreover, there is a lack of studies that take a holistic perspective

[1] The SAMOA Pathway is a SIDS-targeted sustainable development plan adopted following the third International Conference on Small Island Developing States held in Samoa in 2014. The pathway explicitly mentions tourism as one of the most important sectors for achieving sustainable growth in SIDS. The relevance of the international policy debate on SIDS sustainable development and tourism is also highlighted by the designation of the International Year of Small Island Developing States in 2014 and the International Year of Sustainable Tourism for Development in 2017.

on tourism sustainability by explicitly addressing the trade-offs between environmental, cultural, and industry-related aspects. Table 1 provides a summary of the relevant published literature.

Table 1 - Overview of stated preference studies on sustainable tourism

Study	Environmental sustainability	Cultural sustainability	Industry sustainability	SIDS	Visitors type	Method[1]
Kramer and Mercer, 1997	✓			No	Remote	CV
Huybers and Bennet, 2000	✓		✓	No	Remote	CE
Rolfe et al., 2000	✓	✓		Yes	Remote	CE
Svedsäter, 2000	✓			No	Remote	CV
Hong et al., 2003			✓	No	Actual	CE
Kontoleon and Swanson, 2003	✓			No	Remote	CV
Horton et al., 2003	✓			No	Remote	CV
Swanson and Kontoleon, 2004	✓			No	Remote	CV
Alexandros and Jaffry, 2005		✓		No	Actual	CE
Hearne and Santos, 2005	✓		✓	No	Actual	CE
Naidoo and Adamowicz, 2005	✓		✓	No	Actual	CE
Kelly et al., 2007			✓	No	Actual	CE
Kim et al., 2007		✓		No	Actual	CV
Edwards, 2009	✓			Yes	Actual	CV
Choi et al., 2010		✓		No	Actual	CE
Chaminuka et al., 2012		✓	✓	No	Actual	CE
Morse-Jones et al., 2012	✓			No	Remote	CE
Lee and Du Preez, 2015	✓			No	Actual	CE
León et al., 2015	✓		✓	No	Actual	CE
Chen et al., 2017	✓	✓		No	Actual	CV
Navrud and Strand, 2018	✓			No	Remote	CV
Iranah et al., 2018	✓			Yes	Actual	CV

[1] CV: contingent valuation; CE: choice experiment.

In the past few years, a growing literature has focused on the estimation of models combining unobserved factors, such as motivations, experience, attitudes, and beliefs, with observed components of individual utility (e.g. Hess and Beharry-Borg, 2012). This combined approach allows for the estimation of WTP for goods and services while examining the effect that those unobserved factors might have on it. There are studies focusing on the link between pro-environmental attitudes and WTP for protecting endangered species (Choi and Fielding, 2013; Grilli et al., 2018); on improved water quality (Cooper et al., 2004; Hess and Beharry-Borg, 2012; Pakalniete et al., 2017); on engagement in eco-friendly travel modes (Hultman et al., 2015); on land-use policies in Natura 2000 sites (Hoyos et al., 2015); and on recreational park selection (Boxall and Adamowicz, 2002).

This paper aims to expand on this literature and provide novel evidence on tourist preferences for the different aspects of sustainable tourism development in SIDS. The empirical assessment focuses on the drivers of preferences, WTP, and trade-offs that prospective visitors hold for environmental,

cultural, and industry-related sustainability. The aim is to gain an increased understanding of how tourism contributes towards sustainable development and SDGs. Improved evidence of the trade-offs between the dimensions of tourism sustainability can help policy makers and the wider tourism industry to shape policies and initiatives that meet the needs and preferences of established and new market segments. The value attached by prospective tourists to sustainable tourism in remote areas can guide the assessment of financial schemes and resources needed to support a sustainable and equitable development path.

3. Materials and methods

The survey was designed to accommodate attitudinal and behavioural questions and the CE. Each method reveals part of respondents' preferences. CE can determine the marginal willingness to pay for different aspects of tourism options, and attitudinal and behavioural questions can describe latent factors of respondents' preferences.

3.1. Attitudinal and behavioural questions: latent factors

In the survey questionnaire, respondents were presented with 17 attitudinal and behavioural Likert-type statements aimed at describing three latent factors: *Eco-tourism attitudes*, *Pro-environmental private behaviour*, and *Environmental beliefs* (Table 2).

Eco-tourism attitudes are described using six statements adapted from Castellanos-Verdugo et al. (2016). People with those attitudes are expected to target tourism destinations which apply sustainable practices in their accommodation and amenities' management (Chen and Tung, 2014). *Pro-environmental private behaviour* attitudes are described through six statements adapted from Kaiser and Wilson (2004) and can be used to explain intentions to visit sustainably managed tourism destinations. These attitudes have been viewed as good predictors of "environmental activism" (e.g. activities such as donating to environmental organisations) (Dono et al., 2010). In the literature, it has also been found that individuals with strong *Environmental beliefs* act in a more environmentally friendly manner. We identify them by using five of the New Environmental Paradigm statements found in Hultman et al. (2015) and adapted from Dunlap and Van Liere (1978) and Dunlap et al. (2000).

Table 2 - Latent factors and related set of statements presented in the survey questionnaire

Latent factor	Variable	Statement
Eco-tourism attitudes	lf_avoid	Tourism in sustainably managed tourist areas should avoid interfering with the habitat of local flora and wildlife
	lf_conserve	The role of sustainably managed tourist areas goes beyond their economic function
	lf_develop	Sustainable tourism can enhance visitors' personal development

	lf_payment	Visiting sustainably managed tourist areas should be subject to a higher relative payment
	lf_restrict	Tourism in sustainably managed tourist areas should restrict visits to preserve important cultural values and norms
	lf_fundconserv	Part of the income from tourism should fund the promotion of environmental and cultural conservation
Pro-environmental private behaviour	lf_energy	I own energy-efficient household devices
	lf_nearby	In nearby areas (around 20 miles) I use public transportation or ride a bicycle
	lf_transport	I ride a bicycle or take public transport to work or school/university
	lf_envorg	I am an active member of an environmental organisation
	lf_read	I read articles, magazines, or books about environmental issues
	lf_donate	I donate to environmental organisations
Environmental beliefs	lf_interfere	When humans interfere with nature, it often produces disastrous consequences
	lf_abuse	Humans are severely abusing the environment
	lf_equality	Plants and animals have as much right as humans to exist
	lf_balance	The balance of nature is very delicate and easily upset
	lf_intrinsic	Nature has great value which makes its conservation important for current and future generations

3.2. Choice experiment

In CEs, respondents are presented with a set of choice situations and for each of them they are asked to choose between two or more mutually exclusive alternatives. Alternatives are described by a set of attributes that vary between different levels to define potential tourism options (Johnston et al., 2017; Hensher et al., 2005; Hoyos, 2010). The attributes and levels used in this study are summarised in Table 3 and were selected following a literature review and the feedback from a consultation process with stakeholders and practitioners in Fiji and in the UK. Attributes are framed to explicitly capture the different dimensions of sustainable tourism development. The environmental dimension is described through the protection of natural habitats. The socio-cultural dimension is proxied by the preservation of local indigenous communities and heritage (so called *Vanua*[2]) through tourist access limitations. Finally, tourism industry sustainability and economic performance is expressed by the eco-friendly management of accommodation facilities and the project investment timeframe. The inclusion of a payment vehicle allows a measurement of WTP for changes in attributes' levels that

[2] *Vanua* is the Fijian concept of sense of place describing the connection and harmonious co-existence between people and the environment (Kerstetter and Bricker, 2009).

178 can be used to inform policy makers (Champ et al., 2017).[3] One-off donation is considered in this study
179 to be the most appropriate payment mechanism given the remoteness of the study area, the
180 credibility of the choice situations and to mitigate protest behaviour.[4] The levels used for the one-off
181 donation are framed on typical amounts donated in the UK (CAF, 2017) and were pilot tested.

182 **Table 3 - Description of attributes and levels used in the CE**

Attributes	Levels	Status quo
Habitat	1) Mangroves 2) Sandy beaches 3) Coral reef 4) Seagrasses	No specific habitat
Eco-friendly tourist accommodation management	1) No action 2) Waste management 3) Waste management and Energy and water savings	No action
Community management for tourism (*Vanua*)	1) No visits allowed 2) Visits possible but moderate access 3) Free to visit	Visits possible but moderate access
Time for project implementation	1) Immediately 2) 5 years 3) 10 years 4) 25 years	No implementation
Payment vehicle – Donation	1) £10 2) £20 3) £40 4) £60 5) £80 6) £100	No donation

183

184 The five attributes were combined in 24 choice cards using an efficient experimental design[5]. Figure 1
185 shows an example of the choice card. Each respondent was presented with six choice cards, each
186 including two alternatives for ecotourism projects and a status quo. The status quo is added so that

[3] Selecting the most suitable payment vehicle is crucial for consequentiality and incentive-compatibility in CEs (Carson and Groves, 2007; Carson et al., 2014).

[4] Although donations are regarded to have lower incentive compatibility than other payment vehicles (Carson and Groves, 2007; Carson et al., 2014), voluntary donations have been widely employed in CEs literature, particularly in measuring WTP for remote ecosystem goods and services (e.g. Morse-Jones et al., 2012; Rolfe et al., 2000). Further, the UK is among the countries where citizens donate to charities the most (CAF, 2019), making voluntary donation a relevant and familiar payment vehicle.

[5] The experimental design was developed in two steps. In the first step, a D-efficient design was generated (D-error = 0.0318). The design was used to carry out a pilot survey. In the second step, estimated coefficients from a multinomial logit on pilot data were used as priors to generate a Bayesian D-efficient design (Ferrini and Scarpa, 2007; Bliemer and Collins, 2016) with 24 choice situations randomised into four blocks (D-error = 0.0315). The design priors were re-defined after 325 observations of the main survey, leading to a sequential improvement of the Bayesian D-efficient design (D-error = 0.0287). For a review of design efficiency measures see Scarpa and Rose (2008). Experimental designs were developed using Ngene 1.1.2 (ChoiceMetrics, 2014).

187 the trade-off is made with respect to a baseline situation, adding consistency to the theoretical
188 framework (Carson and Groves, 2007; Bateman et al., 2002).

189 **Figure 1 - Example of a choice card**

INFORMATION about the more sustainable tourism project in Fiji	Current situation	Project A	Project B
Natural habitat	N/A	Mangroves	Seagrasses
Eco-friendly tourist accommodation management	No action	Waste management & Energy and water savings	No action
Community management for tourism (*Vanua*)	Visits possible but moderate access	No visits allowed	Free to visit
Time for project implementation	N/A	Immediately	25 years
Donation	No donation	£60	£20

190

191 Before the CE, respondents were briefed with a comprehensive characterisation of the main
192 ecosystems in Fiji followed by the description of the policy context, namely the potential benefits of
193 ecotourism development in SIDS.[6] The choice cards were set in context through an attributes'
194 explanation, cheap talk strategies, and opt-out and individual budget reminders.

195 **3.3. Survey data collection and sample characteristics**

196 Data were collected using an online survey administered through the web panel of a professional
197 survey company[7] and targeting UK residents. Online surveys are now widely employed in valuation
198 studies and have been found to yield reliable WTP measures (Windle and Rolfe, 2011; Olsen, 2009;
199 Lindhjem and Navrud, 2011). After extensive pre-testing on a sample of UK residents, the full survey
200 was administered in December 2017. National representativeness quotas were defined based on
201 gender, age, and geographical region according to the UK population data from ONS (2017). In total
202 1,171 individuals started the survey; of these, around 72% successfully completed it. Therefore, the
203 final sample is composed of 843 UK citizens. Respondents who already visited and never visited a SIDS
204 differ both in terms of socio-demographic and holiday habit characteristics. Respondents who have
205 already visited a SIDS destination at least once are slightly younger, better educated, more likely to be

[6] This detailed description was considered necessary due to the remoteness and complexity of the proposed ecotourism projects and to mitigate information and hypothetical biases (Bateman et al., 2002; Carson and Groves, 2007; Fifer et al., 2014; Hensher, 2010).

[7] The survey was developed on SurveyMonkey platform. The sample of UK residents was provided by Survey Sampling International-Dynata. Respondents were directly recruited by the survey company from its permissioned first-party panel of opted-in consumers. A daily target of respondents recruited and surveys completed was established in order to increase the control on data collection and its overall consistency.

employed, and generally wealthier than respondents who have never travelled to a SIDS. As for holiday habits, in line with expectations, respondents who have already visited a SIDS travel more frequently and to more diverse destinations. The socio-demographic and the holidays-related characteristics of the sample are detailed in Appendix I.

4. Results

4.1. Latent Factor analysis results

Our assumption is that individual latent attitudes, behaviours, and beliefs can help to segment prospective tourist types and better explain unobserved individual heterogeneity in the analysis of choice experiment data. Therefore, in this paper, rather than reporting latent factor analysis and choice experiment results independently, we aim to provide a joint analysis where latent factors contribute to explain the WTP heterogeneity. Before including the latent factors into the choice model, attitudinal and behavioural questions are independently analysed to assess their validity and reliability (see Appendix II for details).[8] Table 4 reports the summary statistics of the indicators used in our analysis. If, on average, an indicator scores high, this implies that respondents care more about the corresponding latent trait. Table 4 shows that mean indicator ratings are systematically higher for *Environmental beliefs* and *Eco-tourism attitudes* than for *Pro-environmental private behaviour*. At the same time, the factor *Pro-environmental private behaviour* shows higher variability across respondents, as the standard deviations of the corresponding indicators, *lf_envorg*, *lf_read* and *lf_donate*, are higher than the others.

Table 4 - Descriptive statistics of the latent factors' indicators

Latent factor	Indicator	Observations	Mean ratings	Standard deviation
Pro-environmental private behaviour	lf_envorg	828	2.23	1.32
	lf_read	824	3.14	1.31
	lf_donate	827	2.75	1.33
Environmental beliefs	lf_interfere	832	4.17	0.85
	lf_abuse	833	4.32	0.85
	lf_equality	829	4.37	0.86
	lf_balance	820	4.35	0.81
	lf_intrinsic	825	4.43	0.81
Eco-tourism attitudes	lf_avoid	827	4.23	0.90
	lf_conserve	792	3.96	0.92
	lf_develop	800	4.07	0.84
	lf_payment	800	3.65	0.99
	lf_restrict	811	3.99	0.89

[8] After a preliminary check of the correlations and the exploratory factor analysis, we detected some critical issues related to the indicators lf_energy, lf_nearby, and lf_transp. Therefore, to reach the most reliable and coherent solution, those indicators were discarded from the analysis.

	lf_fundconserv	819	4.27	0.85

Results from the exploratory factor analysis are summarised in Table 5. Indicator loadings seem to support the three-factors structure. In fact, the indicators selected to describe the factor *Pro-environmental private behaviour*, that is *lf_envorg*, *lf_read*, and *lf_donate*, strongly load on the same, stand-alone factor (Factor 2 in Table 5). From the first column of Table 5 (labelled Factor 1), indicators *lf_interfere*, *lf_abuse*, *lf_equality*, *lf_balance*, and *lf_intrinsic* have factor loadings higher than 0.65 on the same factor, and can then be consistently used to describe the *Environmental beliefs*. Finally, *lf_avoid*, *lf_conserve*, *lf_develop*, *lf_payment*, *lf_restrict*, and *lf_fundconserve* might characterise the same *Eco-tourism attitudes* factor (Factor 3 in Table 5), even if some factor loadings are less definite.

Table 5 - Results from the Exploratory Factor Analysis

Variable	Factor1	Factor2	Factor3
lf_envorg		**0.838**	
lf_read	0.219	**0.755**	
lf_donate		**0.806**	
lf_interfere	**0.698**		0.215
lf_abuse	**0.824**		
f_equality	**0.780**		
lf_balance	**0.840**		
lf_intrinsic	**0.858**		0.258
lf_avoid	**0.632**		*0.479*
lf_conserve	0.405	0.207	**0.571**
lf_develop	0.497	0.252	**0.521**
lf_payment	0.237	0.364	**0.542**
f_restrict	0.488		**0.545**
lf_fundconserv	**0.652**		*0.517*
Eigenvalue	6.445	2.013	0.512
Proportion of explained variance	0.555	0.255	0.221

The reliability of the latent factors structure in Table 5 is subsequently tested calculating Cronbach's alpha (Cronbach, 1951) and Loevinger's H (Loevinger, 1948; Hemker et al., 1995) coefficients (Table 6). As all coefficients are well above the thresholds, we can conclude that our latent factors pass the test of reliability[9] and improve the understanding of the choice experiment preferences.

[9] All latent factor scales present a very good internal consistency, with alpha coefficients always higher than 0.80, and global scalability, with Loevinger's coefficients always higher than 0.30. Further, the three-factors solution was confirmed using a confirmatory factor analysis. The model fits well, with a standardised root mean squared residual lower than 0.08 (Hu and Bentler, 1999).

241 **Table 6 - Reliability coefficients**

Latent factor	Cronbach's alpha coefficient	Loevinger's H coefficient
Environmental beliefs	0.874	0.628
Attitudes toward eco-tourism	0.841	0.520
Pro-environmental private behaviour	0.812	0.653

242

243 ### 4.2. Choice experiment results

244 The responses to the CE questions are first analysed with the multinomial logit model (MNL) which
245 assumes that observable and unobservable preferences are homogenous. The unobservable
246 preferences due to heterogeneity in the error term can be captured using a scaled MNL model.
247 However, in order to relax the homogeneity in observable preferences, we employ the latent class
248 logit model (LCL)[10]. Details on the models used are in Appendix II. Table 7 reports the models' results.
249 The MNL is reported for the pooled sample (Model MNL), the sample of UK residents who have already
250 visited SIDS (Model MNL-V) and the sample of those who have never visited SIDS (Model MNL-NV)[11].
251 The LCL model accommodates preference heterogeneity, clustering respondents according to their
252 common latent traits.[12] The clustering of respondents follows a logistic distribution, as described in
253 Appendix II, and which might be influenced by observable socio-economic characteristics or latent
254 factors. In this case we include in the LCL model the combined effect of past experience, pro-
255 environmental private behaviour, environmental beliefs, and eco-tourism attitudes.

256 **Table 7 - Results from the multinomial logit model and latent class logit model**

	MNL	MNL-V	MNL-NV	LCL Class A	LCL Class B	LCL Class C
Average class share				**35.2%**	**50.3%**	**14.5%**
	Variables used in class allocation probabilities					
Visited SIDS				0.543**	0.562**	---
				(0.276)	(0.264)	
Pro-environmental private behaviour				0.672**	0.857**	---
				(0.273)	(0.248)	
Environmental beliefs				0.010	0.420	---
				(0.353)	(0.324)	
Eco-tourism attitudes				0.458	0.999**	---
				(0.382)	(0.344)	
	Model coefficients					
ASC – Status quo	-0.415**	-0.425**	-0.525**	-1.290**	-3.129**	1.976
	(0.121)	(0.184)	(0.155)	(0.282)	(0.400)	(1.318)

[10] The scaled MNL was estimated using the Stata (StataCorp, 2017) package *clogithet* (Hole, 2006) and the LCL model was estimated using the Stata package *lclogit* (Pacifico and Yoo, 2013).

[11] The feasibility of using a split sample was tested by estimating an MNL model including interactions between the attributes and a dummy indicator for the visited/not visited status. Most interaction terms' coefficients were statistically significant, so that using a split sample has been considered robust.

[12] The choice of the optimal number of latent classes for the LCL relies on the examination of AIC and CAIC. Several LCL models with different number of classes are estimated and the one with the smallest AIC and CAIC is selected.

Habitat – Sandy beach	-0.002	0.028	-0.001	0.321**	-0.114	0.724
	(0.033)	(0.059)	(0.052)	(0.117)	(0.091)	(0.568)
Habitat – Coral reef	0.135**	0.166**	0.134**	0.447**	0.185*	0.158
	(0.050)	(0.083)	(0.064)	(0.150)	(0.110)	(0.836)
Habitat – Mangroves	0.008	0.127**	-0.090*	0.209*	-0.111	0.508
	(0.033)	(0.063)	(0.056)	(0.124)	(0.093)	(0.586)
Waste management	0.171**	0.081	0.290**	0.185	-0.412	0.791
	(0.060)	(0.084)	(0.088)	(0.148)	(0.369)	(0.641)
Waste management + energy and water savings	0.284**	0.230**	0.391**	0.036	0.709**	0.294
	(0.071)	(0.086)	(0.094)	(0.155)	(0.117)	(0.898)
Vanua – No visit allowed	-0.174**	-0.167**	-0.204**	-0.739**	-0.121	-1.580**
	(0.053)	(0.071)	(0.073)	(0.135)	(0.097)	(0.684)
Vanua – Moderate access	-0.001	-0.041	0.047	-0.279**	0.165**	-0.328
	(0.028)	(0.048)	(0.045)	(0.103)	(0.082)	(0.451)
Time for project completion	-0.007**	-0.003	-0.012**	-0.017**	-0.016**	-0.048
	(0.003)	(0.004)	(0.005)	(0.008)	(0.007)	(0.043)
One-off donation	-0.005**	-0.003*	-0.007**	-0.024**	0.001	-0.041**
	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)	(0.013)
Scale – 18-34 years old	-0.389**	0.161	-0.511**			
	(0.127)	(0.342)	(0.170)			
Scale - 35-64 years old	-0.347**	-0.031	-0.328**			
	(0.104)	(0.267)	(0.130)			
Scale – upper secondary	0.795**	0.201	0.634**			
	(0.245)	(0.501)	(0.234)			
Scale – university/professional qual.	0.999**	0.694*	0.782**			
	(0.247)	(0.406)	(0.234)			
Scale – post-graduate	0.950**	0.576	0.823**			
	(0.280)	(0.463)	(0.288)			
N	842	304	538		843	
Log Likelihood	-5254.29	-1878.03	-3345.99		-4297.07	

Notes: ** statistical significance at 5% level, * statistical significance at 10% level; standard errors in parenthesis.

The inclusion of latent factors into the LCL provides a three-class model that suggests that preferences can be clustered in three homogenous groups (last three columns of Table 7). People in each group share similar WTPs. Groups differ with respect to respondents' unobservable traits. Group C is the reference category and we can observe that, compared to this group, Groups A and B have an higher probability to have visited SIDS, have stronger pro-environmental private behaviours and, for group B, express stronger eco-tourism attitudes.

Considering the preference heterogeneity in tourism factors, we observe that the *environmental-friendly visitors* (Class A) generally prefer that projects for the sustainable management of tourism development are implemented and completed sooner within the timeline proposed in the CE. They have positive and significant preferences for the protection of all habitat types but are not willing to donate if the sustainably managed areas are subject to any form of access restriction. They are also indifferent between tourism accommodation management practices.

The *eco-tourists* (Class B) also prefer that projects for the sustainable management of tourism development take place, but with a stronger intensity than those in Class A, and realised sooner within

the timeline proposed in the CE. They are indifferent about the amount to donate to sustainable tourism projects and would moderately restrict access to the sustainably managed areas, possibly considering it as a suitable way of protecting cultural identity. They strongly prefer the highest standard for the management of tourist accommodations and have clear preferences for coral reefs preservation.

The *indifferent non-visitors* (Class C, reference class) are generally indifferent to sustainable tourism projects taking place, report a strong and significant lack of willingness to donate to fund sustainable tourism practices, show no preference between habitats to be protected and types of accommodation management. They also show very strong dissatisfaction related to the lack of access to the sustainably managed areas. Compared to the other classes, respondents in Class C are more likely to have not previously visited a tropical destination. They also display lower private eco-friendly behaviour and attitudes toward eco-tourism. Concerning socio-demographic characteristics, compared to the other classes, respondents in this class are generally older, with a lower level of education and a slightly lower personal income. Also, they are slightly more likely to be retired or unemployed and live in a household with no children.

4.3. Willingness to pay for sustainable tourism development

Table 8 reports the marginal WTP values that represents the amount that individuals are willing to pay as a one-off donation in relation to a specific attribute. A positive marginal WTP means that, on average, respondents receive utility (i.e. satisfaction) from a specific attribute and are willing to donate more. On the other hand, a negative marginal WTP means that, on average, respondents suffer a disutility (i.e. dissatisfaction) from a specific attribute and are not willing to donate.

Table 8 – Marginal willingness to pay for sustainable development attributes (in £ value)

	MNL	**MNL-V**	**MNL-NV**	**LCL Class A** Environmental friendly visitors	**LCL Class B** Eco-tourists	**LCL Class C** Indifferent non-visitors
Habitat – Sandy beach	-0.33	10.39	-0.16	13.29*	-197.70	3.87
Habitat – Coral reef	29.97*	61.85*	19.80*	18.49*	322.33	17.78
Habitat – Mangroves	1.76	47.34*	-13.32*	8.66*	-193.27	12.47
Waste management	37.84*	29.94	42.75*	7.65	-715.29	19.42
Waste management + energy and water savings	62.92*	85.31*	57.59*	1.50	1232.51	7.21
Vanua – No visit allowed	-38.51*	-61.92*	-30.04*	-30.57*	-210.97	-38.78*

Vanua – Moderate access	-0.17	-15.22	6.87	-11.53*	287.51	-8.04
Time for project completion	-1.55*	-1.27*	-1.73*	-0.69*	-27.60	-1.18

Notes: * significant MWTP: attribute model coefficient and donation model coefficient are both statistically significant.

Considering the MNL model (which just explains the homogenous preferences for tourism factors assuming no differences across respondents) results show that respondents are most willing to increase their donations if tourist accommodations employ the highest standard of sustainability, that is both waste management and energy and water saving practices. They are willing to donate £85.31 and £57.59, respectively whether they have already visited or not visited a SIDS destination. Respondent donation decreases if access to the new sustainably managed areas is forbidden, particularly for those who have already visited a SIDS destination. They are willing to donate £61.92 less. Respondents with past experience of SIDS are willing to donate considerably more, £61.85 and £47.34, to protect corals and mangroves respectively. Also, respondents without the same experience are willing to donate more to protect natural ecosystems, but only if they are coral reefs (£19.80 more); their donation would instead decrease by £13.32 if mangroves are the targeted protection habitat. All respondents present a decreasing willingness to donate if projects are to be implemented in future years.

Once the LCL model is implemented we can disentangle respondents' WTP considering their latent beliefs, attitudes and behaviours. With this model, WTPs are available for the three groups of respondents. The *environmental-friendly visitors* (Class A) are generally willing to donate more for the protection of all habitats, namely £13.29 for beaches, £18.49 for corals, and £8.66 for mangroves. They would donate less if access is forbidden or somewhat restricted, respectively £30.57 and £11.53 less. Also, their donation would be decreased by £0.69 for each extra year more it takes to project completion. The *eco-tourists* (Class B) have an insignificant donation coefficient, but significant preferences for some of the attributes (see Table 7). This means that they are indifferent to the donation amount needed to see the completion as soon as possible of projects comprising protection of corals, high environmental standards in accommodation management, and moderate access to the sustainably managed areas. Finally, *indifferent non-visitors* (Class C) are generally not willing to donate for any sustainable tourism project.

5. Discussion

Table 7 presents the results for the pooled and the split (visitors vs non-visitors) samples and their comparison provides interesting insights. Respondents generally hold strong preferences for preserving the iconic coral reefs in Fiji, and are considerably stronger for respondents who visited a SIDS destination in the past. The effect of preserving mangrove forests significantly and positively

affects the preferences of those who visited a SIDS, but negatively affects preferences for those who have not visited. This result suggests that past experience of SIDS visitation, through increased knowledge, improves peoples' understanding of services provided by the different ecosystems and awareness of the need for their preservation. As far as the management of *Vanua* preservation is concerned, which represents the cultural factor of tourism, respondents generally favour the opportunity to experience the indigenous culture and therefore wish to access the sustainably managed tourist areas. Indeed, the complete closure of *Vanua* sites causes a substantial decrease in respondent utility. This result is particularly relevant because it highlights how prospective tourists not only hold non-use values, but also use values (e.g. quasi-option values) for distant cultural ecosystem services. Preferences for the eco-friendly management of tourist accommodations show some degree of divergence. Both groups of visitors have significant positive preferences for eco-friendly management, but those who already visited a SIDS only favour the highest standard (i.e. waste management plus water and energy savings). Respondents, who had already visited SIDS destinations, were not affected by a significant project time delay compared to those who never visited. This suggests that the completion of a project is more relevant than the time spent to complete it. Finally, respondents who have already visited SIDS destinations are on average more likely to donate to sustainable tourism projects.

The LCL analysis helps to understand how the three clusters differ in their attitude towards the tourism factors. Respondents in Classes A (the *environmental-friendly visitors*) and B (the *eco-tourists*) hold both direct and indirect use value for the natural resources, compared to the reference Class C (the *indifferent non-visitors*). Also, respondents in Classes A and B are more likely to have visited a SIDS. In both Classes A and B, respondents are generally younger and with a higher education than those in Class C. Moreover, there are more respondents in employment and with a high personal income. The socio-demographic characteristics in Classes A and B are similar, with the main difference being the presence of more numerous families in Class B.

Our results indicating a positive WTP to protect remote and endangered ecosystems are in line with previous literature (see Table 9).

Table 9 - WTP studies for remote ecosystems and species

Study	Ecosystem/Species	Sample	WTP
Svedsäter, 2000	South America rainforest	UK students and Swedish residents	£37.0
Horton et al., 2003	Brazilian Amazon	UK and Italian residents	£30.0
Swanson and Kontoleon, 2004	Namibian Black Rhino	UK residents	£15.2
Morse-Jones et al., 2012	Wildlife in Tanzania	UK residents	£9.7-£15.9

Our results confirm that preserving the iconic coral reefs is worth more than preserving unfamiliar remote species, echoing the finding in Morse-Jones et al. (2012). Our findings also suggest that prospective tourists not only hold non-use values (Rolfe et al., 2000) but also quasi-option values. The latter is reflected in the decrease in donations that would follow access restrictions to the sustainably managed tourist areas. Results also show that prospective tourists hold positive preferences and are on average willing to pay for tourist accommodations where environmental-friendly practices are implemented, in line with some previous literature results (e.g. Hultman et al., 2015; Huybers and Bennet, 2000; do Valle et al., 2012).

Also, as expected, respondents who have already visited a SIDS are more willing to donate to schemes for the protection of natural habitats (Choi and Fielding, 2013; Kramer and Mercer, 1997). They also favour the most environmental-friendly and effective practices related to tourist accommodation. In addition, respondents with higher pro-environmental private behaviours and eco-tourism attitudes are willing to donate more for the protection of remote ecosystem services and, in general, for the development of sustainable tourism programmes in remote destinations.

6. Conclusions

Our research aimed to improve the understanding of prospective visitors' preferences and trade-offs for the environmental, social, and economic aspects of sustainable tourism development options in SIDS. The paper provides a mixed methodology combining latent factor analysis and choice experiment models. The joint use of the two methods has the potential to broaden the investigation of tourists' preferences for sustainability by allowing a more thorough exploration of diverse determinants, and can be flexibly adapted to different topics in the wider context of sustainable tourism development. The empirical results of our study contribute to a better understanding of Western residents' preferences about sustainable development and sustainable tourism projects in remote destinations. They also provide an opportunity to target specific types of tourists (environmental-friendly Class A visitors and eco-tourists Class B) and match them to specific destinations.

Although our analysis is based on findings for Fiji our recommendations can be generalised, offering useful insights for sustainable tourism development in other SIDS. At the same time, the joint modelling of economic, environmental and socio-cultural factors related to sustainable tourism projects, sheds light on how respondents perceive and value the trade-offs. Overall, our findings may help to better appraise sustainability projects involving resource flows between developed and developing countries and to help enable more resilient sustainable tourism plans, interventions, and cooperation. Our project results also suggest the need to raise awareness about the importance of

387 the natural capital and local cultures in tropical countries with potential tourists, so to incentivise
388 sustainable tourism. From a financial perspective, policy makers in SIDS could use our results to
389 consider developing new payment for ecosystem services schemes tailored for sustainable tourism
390 projects. For example, payment schemes that promote more sustainable practices (e.g. improved
391 waste and water treatment) through the creation of a local labelling system for tourist resorts; or to
392 create new types of sustainable entrance tickets (e.g. limited in number and per season) to the
393 communities, or to the marine protected areas.

Appendix I – Descriptive statistics of the sample

Variable	Categories	Total sample (%) (N = 843)	Visited SIDS destination (%) (N = 305)	Never visited SIDS destination (%) (N = 538)
Gender	Female	51.0	44.6	54.6
	Male	49.0	55.4	45.4
Age	18-24 years old	12.0	11.5	12.3
	25-34 years old	16.6	23.6	12.6
	35-44 years old	17.8	16.4	18.6
	45-54 years old	18.0	16.4	19.0
	55-64 years old	15.1	12.1	16.7
	65 years old and over	20.5	20.0	20.8
Region	Scotland and N. Ireland	11.5	7.8	13.6
	Northern England	22.9	18.7	25.3
	Central England	29.9	27.9	31.0
	Southern England	22.9	27.2	20.4
	London area	12.8	18.4	9.7
Education level attained	Upper secondary	49.2	40.0	54.5
	University qualification	33.0	40.4	28.8
	Professional Qualification	9.6	9.8	9.5
	PhD qualification	8.2	9.8	7.2
Working condition	Employed	54.4	67.5	47.0
	Unemployed	5.3	4.3	6.0
	Retired	22.5	19.3	24.4
	Other	17.7	8.9	22.7
Household composition	One person	19.1	16.1	20.8
	Single parent	3.4	3.9	3.2
	2 adults, no children	32.9	33.1	32.7
	2 adults, with children	20.9	23.3	19.5
	3+ adults, no children	13.3	12.1	13.9
	3+ adults, with children	10.4	11.5	9.8
Personal Income		£15,001 to £25,000	£25,001 to £35,000	£15,001 to £25,000
Household income		£30,001 to £50,000	£30,001 to £50,000	£20,001 to £30,000
Frequency of holidays - general	Less than once per year	28.9	20.7	33.6
	Once per year or more	69.5	78.3	64.5
	Don't' know	1.6	1.0	1.9
Frequency of holidays – last year	Less than two times	62.7	55.7	66.7
	More than three times	31.1	42.6	24.6
	Do not know	6.2	1.7	8.7
Favourite destination	United Kingdom	37.4	28.5	42.4
	European Union	37.5	36.7	37.9
	Outside European Union	19.0	33.1	11.0
	Do not know	6.2	1.7	8.7
Visited sustainable destination	No	77.7	56.1	90.0
	Yes	22.3	43.9	10.0

Appendix II - Econometric models

The utility obtained by individual *n* from choosing alternative *i* is composed of an observable deterministic part V_{ni} and an unobserved random component ε_{ni}

$$U_{ni} = V_{ni} + \varepsilon_{ni} = \beta_i x_{ni} + \varepsilon_{ni}$$

and the resulting multinomial logit model (MNL) probability for individual *n* of choosing alternative *i* is (McFadden, 1974)[13]

$$P_{ni} = \frac{e^{\mu_n \beta x_{ni}}}{\sum_{j=1}^{J} e^{\mu_n \beta x_{nj}}}$$

A popular way to account for preference heterogeneity is to use a latent class logit model (LCL). The LCL has been preferred to link taste heterogeneity to individual characteristics such as latent factors (Hess et al., 2009; Hess and Daly, 2014; Hensher and Greene, 2003). The LCL is preferred here to a hybrid choice model specification (Ben-Akiva et al., 2002) because the aim is to segment respondents based on the latent factors more than explicitly exploring their impact on taste coefficients. The flexibility of the LCL arises when a class allocation model is used to link class probabilities to characteristics of respondents (Hess et al., 2009)

$$\pi_{nk} = \frac{e^{\delta_k + g(\omega_k, z_n)}}{\sum_{l=1}^{K} e^{\delta_l + g(\omega_l, z_n)}}$$

where δ_k is a class-specific constant, z_n is the vector of individual characteristics, ω_k the related parameters. In this analysis, the individual characteristics z_n are the latent factors defined in Section 3.1. The derivation of such variables is briefly summarised. For more details, see Kline (2010), Bollen (1989), Nunnally and Bernstein (1994). The 17 indicators presented in the survey questionnaire can be considered as the observed manifestation of underlying latent individual factors. Once indicators are measured, their capacity to describe the intended latent factors needs to be tested. Exploratory factor analysis is used to group indicators describing the same underlying factor, which are subsequently tested for reliability using the Cronbach's alpha (Cronbach, 1951) and the Loevinger's H coefficient (Loevinger, 1948; Hemker et al., 1995). Confirmatory factor analysis is then employed to confirm the statistical significance of the procedure. If significance is confirmed, an individual "score" on each latent factor is calculated. Finally, binary indicators to be used in the LCL class allocation are

[13] The term μ_n is the scale parameter accounting for the heterogeneity in the variance of the unobserved error term (Hensher et al., 2005; DeShazo and Fermo, 2002; Hole, 2006; Train, 2009). It is inversely proportional to the error variance, that is equal to $\mu_n = \pi/\sqrt{6\sigma_n^2}$. This heteroscedastic MNL or scaled MNL, contrary to the typical specification, allows an unequal error variance across respondents functional to individual characteristics z_n. Here, education and age are the only individual characteristics to have a significant effect on the scale parameter.

derived. If the score of individual *n* on the latent factor *l* is $s_{nl}$and the median score in the sample for the factor *l* is $med(s_l)$, the indicator variable is

$$ind_n(lf_l) = \begin{cases} 1 & if \quad s_{nl} > med(s_l) \\ 0 & if \quad s_{nl} \leq med(s_l) \end{cases}$$

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