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Examining the antecedent role of biosphere value, environmental usefulness and ecotourism involvement: an empirical study

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Abstract: While recently there has been the increasing importance of ecotourism and sustainable behaviour, studies have not been able to address substantially the generation of individual dimensions of ecotourism behaviour. The current investigation explores the role of perceived biosphere value, perceived environmental usefulness, and ecotourism involvement for understanding the growth of socio-cultural beneficial behaviour, economically beneficial behaviour and environmental friendly behaviour. The study has seven latent variables that were operationalised in a first order. All the constructs were developed based on established scales, complemented with pre-test and expert feedback. The data were collected from individuals who are frequent travellers to nature-based destinations. The study had 108 usable responses. The study used partial least squares in R-Studio to validate the proposed associations. Results suggest a prominent role of ecotourism involvement and perceived biosphere value in shaping the different variants of ecotourism behaviour.

Keywords: biosphere value; ecotourism involvement; ecotourism behaviour; tourist behaviour.

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1 Introduction

The tourism sector contributes trillions of dollars to the work economy and moves more than 1.2 billion people every year (UNWTO, 2017). It is one of the largest industries in the world, benefiting society and influencing the economy, but there is a high environmental cost involved with it. It has severe negative impacts on physical, biological and non-material components of the environment (Amelung and Lamers, 2007). Several studies have acknowledged the negative contribution of tourism to the environment such as climate change (Gössling, 2002), air pollution (Mieczkowski, 1995),

water pollution (Andereck, 1993), therefore it becomes significant to study the behaviour of tourists to help restrict this negative environment damaging habit.

Ecotourism emerged as a new form of tourism during the 1980s to replace the environmentally unfriendly format of mass tourism (Koens et al., 2009; Mondino and Beery, 2019; Weaver, 2007; Ogorelc and Milfelner, 2017). The aim was to create more positive environmental, socio-economical outcomes from tourism (Wondirad et al., 2020), as expected ecotourism gained importance in the tourism sector as it was considered to fulfil the goals of conservation and sustainable tourism development (Jamaliah and Powell, 2018; McKercher et al., 2010; Walter, 2011, 2013). One of the most widely accepted and earliest definitions of ecotourism was coined by Ceballos-Lascurain (Blamey, 2001; Boo, 1990). Ceballos-Lascurain (2008) defined ecotourism as travelling to undisturbed natural areas to study and enjoy the scenery along with the cultural manifestations existing in these areas.

Although widely expected, this definition has its criticisms mainly that it lacks foresight, it focuses on the actions of the tourist, rather than implying what they should do (Fennell, 2001; Stewart and Sekartjakrarini, 1994). One of the modern definitions of ecotourism is propounded by Björk (2000), as it combines various components of ecotourism and its stakeholders (Wondirad et al., 2020). According to Björk (2000), ecotourism can be defined as an activity that involves cooperation between authorities, tourism industry, tourists, and the local people in making possible for tourist to visit and enjoy the nature and culture that does not harm the environment but contributes for sustainable development.

Therefore, there is a growing need to study the development of ecotourism behaviour exhibited by tourists. Eco-tourism behaviour indicates the certain behavioural practices demonstrated by tourists when they visit certain destinations that require preserving their environment (Lee and Jan, 2018). Such behaviour also aids in the local community and economic development. The attitude towards the environment at the individual level, social norms and behavioural control with environment-friendly behavioural intentions can aid in the development of ecotourism behaviour (Honey, 1999). Literature highlights several important dimensions of ecotourism behaviour, e.g., environmental friendly behaviour (EFB), socio-cultural beneficial behaviour (SCBB) and economically beneficial behaviour (EBB). However little research exists regarding the development of each of these dimensions of ecotourism behaviour. So, this study based on a comprehensive literature review found several potential important enablers. The first latent enabler was perceived biosphere value that indicates the importance attached to derived environmental benefits (Stern and Dietz, 1994; Frederick, 2018). The second potential enabler is perceived environmental usefulness that suggests the extent to which individuals feel the need of conserving the environment for future generations. The third potential enabler suggested from the literature review was ecotourism involvement suggesting the extent to which individuals are engaged with safeguarding the destination environment while engaged in touristic activities. The potential dimensions for interest in the current investigation are socio-cultural beneficial behaviour, economically beneficial behaviour and environmental friendly behaviour. Socio-cultural beneficial behaviour indicates those activities of tourists that aids in cultural exchange, boost cultural relationships with the local communities and aids in better understanding of each other's societies in tourism (Lee and Jan, 2018). Economically beneficial behaviour denotes those activities of tourists that boost the economic prosperity of a destination, e.g.,

shopping artefacts, textile products and souvenirs aids in local economic development (Lee and Jan, 2018). Environmental friendly behaviour denotes those activities of tourists that aid the local authorities and communities in saving and safeguarding their environment from damages, e.g., proper waste disposal, etc.

Hence to summarise, the following are the research questions:

- a Does perceived biosphere value influence perceive environmental usefulness and ecotourism involvement?
- b Does perceived environmental usefulness influence environmental friendly behaviour, socio-cultural beneficial behaviour and economically beneficial behaviour?
- c Does perceived ecotourism involvement influence environmental friendly behaviour, socio-cultural beneficial behaviour and economically beneficial behaviour?

The study has been arranged successively. The next section briefly portrays the literature associated with ecotourism and leads the way for hypotheses development. The subsequent section discusses measurement development, sampling, and data collection. The further sections elaborate on the findings and conclude with implications for managers. For sake of simplicity henceforth we would be referring to the latent variables in this study as perceived biosphere value → BV, perceived environmental usefulness → EU, ecotourism involvement → EI, socio-cultural beneficial behaviour → SCBB, environmental friendly behaviour → EFB and economically beneficial behaviour → EBB.

2 Literature review and hypotheses development

In recent years, the concept of sustainable ecotourism has been gradually accepted by more people. Particularly, after the era of constant exploitation there has been a widespread concern over the rapid depletion of natural resources. Agreements such as the UN initiative of sustainable development goals (SDGs) in 2015, the New York Declaration on Forests in 2015, The Paris Climate Agreement, etc. have been the steps initiated to reduce the depletion rate and restore the balance in the environment, increase forest covers, and improve the local livelihoods of the rural population (Kry et al., 2020). Several studies have been conducted to identify the positives of ecotourism. It was shown to reduce environmental problems, increase the management of natural resources and their conservation, improve the local community, and alleviate poverty. It is also a major source of income for local people with ecotourism generating US\$29 billion annually. Furthermore, studies have shown that ecotourism can reduce deforestation and increase forest cover in its sites (Kirkby et al., 2011; Ma et al., 2019; Powell et al., 2018; Kimengsi et al., 2019; Almeyda et al., 2010). Studies have shown that tourism is a way to restore economies in an environmentally friendly way (Ghaderi and Henderson, 2012; Tahat and Mardini, 2021; Gallucci and Dimitrova, 2020). Tourism has been shown to influence the culture, social welfare and natural environment of a place (Andriotis, 2005; Vedeld et al., 2012; Luo et al., 2020). From an economic perspective, tourism is a tool for the economic development of a region (Truong, 2018).

Tourism is generally considered to be a clean industry concerning pollution (Stylidis et al., 2014; Frederick, 2018). Tourists are becoming ecologically more conscious than before (Dewald et al., 2014) and the demand for environmentally friendly products has

significantly risen (Hong and Guo, 2019). Ecotourism is the key factor in achieving conservation goals (Cabral and Dhar, 2020). In general, it can be used as a tool to understand and solve problems due to environmental exploitation (Kry et al., 2020). Even with these advantages at the same time, it has also been identified that unorganised tourism could lead to the exploitation of natural resources and acts that could damage the natural environment of an area (Hong and Guo, 2019). Studies have shown that tourism creates a better understanding of the need to protect the natural environment by increasing the environmental infrastructure and environmental education in the host nation (Hillery et al., 2001; Reynolds and Braithwaite, 2001; Brown and Ulgiati, 2018). Hence, it is no doubt that ecotourism plays a very crucial role in protecting and conserving the local natural environment. This study uses, in particular, three different concepts to understand how they influence the behaviour of tourists: perceived biosphere value, perceived environmental usefulness and environmental involvement.

Perceived biosphere values refer to the concerns about the environment based on costs and benefits involved (De Groot and Steg, 2008). Values are considered the principles which guide life (Schwartz, 1992). They are developed during the early stages of life and usually remain consistent during their lifetime (Balundè et al., 2019). Studies have shown the importance of perceived biosphere values in understanding pro-environmental behaviour and decisions to involve in environmental friendly actions (van der Werff et al., 2013; Brown and Ulgiati, 2018), the way it influences the concerns for nature (Martin and Czellar, 2017) and predicting future concerns for pro-environmental behaviour (Daryanto and Song, 2021). Studies have also shown that perceived biosphere values and environmental concerns are closely related (Sharma and Gupta, 2020).

Involvement is a person's perceived relevance of the object based on inherent needs, values and interests, people tend to get involved with an object or situation if it becomes personally relevant to them (Zaichkowsky, 1985). It is a complex process that consists of the attitude and decisions of an individual (Lin et al., 2017). Studies have shown that the decision making of an individual varies with the level of involvement, hence influencing their behaviour (Laurent and Kapferer, 1985). In the tourism context studies have shown that involvement influences tourist behaviour. It is categorised as the motivation to be involved in certain specific tourism activities, interaction with social environments, emotional bonding, perception of experience etc. (Gursoy and Gavcar, 2003; Havitz and Dimanche, 1997; Kyle et al., 2003; Prayag and Ryan, 2012; Prebensen et al., 2013; Pretty et al., 2003; Lyon et al., 2017; Hanna et al., 2019).

Perceived environmental usefulness here is used in the context of environmental engagement of tourists. Studies have shown that environmental engagement is a very important antecedent of tourist behaviour and that it is facilitated by tourist learning (Manoj et al., 2020). It has also been shown that environmental engagement is influenced by moral reflectiveness which influences their behaviours (Verma and Chandra, 2018).

2.1 Perceived biosphere value with perceived environmental usefulness and ecotourism involvement

An orientation towards biosphere values occurs when an individual observes the ecosystem and judges it (Stern and Dietz, 1994), Earlier studies have shown that perceived biosphere value promotes an increased environment-friendly behaviour

(De Groot and Steg, 2010; Brown and Ulgiati, 2018). Van der Werff et al. (2013) indicated that the higher the perceived biosphere value for an individual, the higher for them to pay more attention to the environment and taking action to protect it. Environmental engagement creates awareness on tourists to the environmental issues and makes them adopt methods to solve or prevent those issues (Dean et al., 2018). People who are keen on the biosphere value will be strongly taking the decision based on the acceptance of the increase in the perceived risk and benefits of the ecosystem (De Groot and Steg, 2008; Frederick, 2018). Pro-environmental behaviour and beliefs will have a strong relation to the biosphere value. Thus, we propose the following:

H1 BV positively affects the EU.

Perceived biosphere value is the choice an individual takes to decide whether to act pro environmentally or not, based on the costs and benefits associated with the ecosystem and the biosphere as a whole (Stern and Dietz, 1994; Lyon et al., 2017). It offers a distinct definition for environmental beliefs and intentions (De Groot and Steg, 2008; Frederick, 2018). Perceived biosphere value could be the unrivalled description for how people behave when confronted with environmental issues (De Groot and Steg, 2007; François et al., 2017). Several pieces of research have shown that biosphere values affect an individual's pro-environmental behaviour in various contexts (Schultz et al., 2005; Han and Yoon, 2015). Similarly, Perkins and Brown (2012) have suggested that tourists with greater biosphere values tend to show higher involvement with nature and consideration of the human behavioural impact on nature. The person who gives high importance to biosphere value will be mostly contributing to the environment beneficial activity and hence ecotourism involvement can be affected (Lyon et al., 2017). Hence, following the above, we propose the following hypothesis:

H2 BV positively affects EI.

2.2 *Perceived environmental usefulness with ecotourism involvement*

Involvement is a person's perceived relevance of the object based on inherent needs, values, and interests (Zaichkowsky, 1985). Involvement is a state of interest, motivation, or arousal (Rothschild, 1984; Hanna et al., 2019). In the context of tourism, involvement is defined as a psychological state of motivation, between an individual and their recreational activities, characterised by various elements which include the pleasure value, probability of risks and their consequences (Hanna et al., 2019). Further involvement in tourism influences how an individual evaluates and participates in tourist activities (Havitz and Dimanche, 1997; Hanna et al., 2019). Involvement, as a subject has been studied previously in tourist context with results showing involvement, leads to better engagement (Madrigal et al., 1992; Kim et al., 2009; Harrigan et al., 2017; Gu et al., 2020). Thus, assuming that ecotourism involvement is an important aspect regarding the choice of travel activities, we propose the following hypothesis:

H3 EU positively affects EI.

2.3 *Perceived environmental usefulness with SCBB, EBB and EFB*

Perceived environmental usefulness denotes the felt utility of saving and safeguarding the environment by individuals. Such perceived felt importance of environment often helps

in realising the benefits obtained from the conservation of the environment (Santana et al., 2019). Therefore, such perceived importance of derived benefits from nature would help tourists to seriously think of environmental conservation (Chen and Qiu, 2017). Accordingly, individuals would behave more in an environmental friendly manner if they feel the utility of derived benefits of environmental conservation (Wu et al., 2021). On a similar note, tourists visiting destinations would try to stay at locally owned accommodations, would dine local food and explore local culture and history through purchasing artefacts and hand-made products (Lee and Jan, 2018). Hence, such practices would aid in boosting local economic development and socio-cultural development, with an exchange of history and culture of one another as tourists mingle more with local communities (Wu et al., 2021; Mandal et al., 2021). Tourist can acquire insights about the local culture and tradition by understanding the local history, appreciating the rules and regulation which is followed by the residents (Fennell, 2020). Depending on the rules and regulations followed in the area, the residents may or may not get any benefits from tourism. But according to the social exchange theory, benefits from tourism are much higher than the cost incurred for the development by the resident who supported the tourism (Lee and Jan, 2019). A natural ecosystem is not interfered with by eco-friendly tourists (Wu et al., 2021). Furthermore, they keep the environment as clean as they were before human intervention. Accordingly, the study posits that one's feeling of environmental conservation would aid positively in the development of socio-cultural beneficial behaviour, economically beneficial behaviour and environmental friendly behaviour.

H4 EU positively affects SCBB.

H5 EU positively affects EBB.

H6 EU positively affects EFB.

2.4 Ecotourism involvement with socio-cultural beneficial behaviour, economically beneficial behaviour and environmental friendly behaviour

Tourism is subjected to social and cultural impacts on the host nation. They are defined as the changes that happen in the life quality, traditional values, and norms in the life of residents at tourist destinations due to constant exposure to tourism (Glasson, 1995). There has been regular and vast discussion on the impact of tourism on social quality and culture (Jamal and Camargo, 2014; Carneiro et al., 2018). Economic benefits refer to the tangible rewards which people receive and they play an important role for locals to participate in tourist activities (Liu et al., 2014). It has also been shown that economic benefits support environmental sustainability (Fennell and Weaver, 2005), indicating tourists may engage in EBB. Environmental friendly behaviour is the concern of an individual of the natural environment (Cottrell and Graefe, 1997). An environmental friendly tourist would appreciate the environment (Dolnicar and Grün, 2009). These tourists do not disturb the natural ecosystem and insist on keeping the ecosystem clean (Lee et al., 2013). Thus, as per the above, we put forward the following hypothesis:

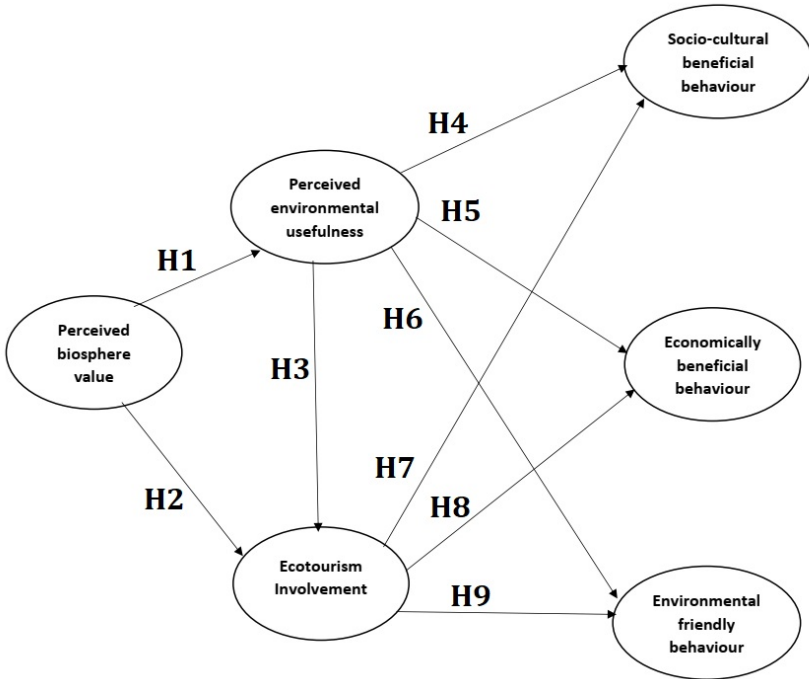
H7 EI positively affects SCBB.

H8 EI positively affects EBB.

H9 EI positively affects EFB.

Figure 1 summarises the proposed associations

Figure 1 Theoretical model



3 Methods

3.1 Sample collection

The study primarily aims to understand the development of important dimensions of ecotourism behaviour, e.g., socio-cultural beneficial behaviour, economically beneficial behaviour and environmental friendly behaviour through potential enablers collected based on extensive literature review. So primarily with a focus on tourists’ sample, the study collected the items from literature, then subjected them to expert review and feedback and a pre-test with 51 items to ensure face validity. Principal component analysis is conducted to ensure items are indeed measuring the relevant construct. The results were satisfactory with appropriate loadings with factors and satisfying recommended thresholds for KMO and Bartlett’s test. The items loaded on expected factors. Table 1 describes the pre-test sample, measurement items and the rotated factor pattern. SCBB1–SCBB4 represent measurement items for socio-cultural beneficial behaviour, EBB1–EBB5 represent items for economically beneficial behaviour, EFB1–EFB4 represent items for environmental-friendly behaviour, EI1–EI4 represent items for ecotourism involvement, BV1–BV4 represent items for perceived biosphere value and EU1–EU4 represent items for perceived environmental usefulness.

Table 1 Measurement items (pre-test descriptives and rotated factor loadings)

	Mean	Std. deviation	Component							
			1	2	3	4	5	6		
Socio-cultural beneficial behaviour adapted from Lee and Jan (2018)										
I like to know more about the local history	5.940	1.475								0.868
I collect info regarding expected behaviour while on trip	4.880	1.409								0.844
I have a deep respect for the local culture of every place I visit	5.710	1.566								0.886
I respect the local traditions of a place that I visit	5.240	1.491								0.849
Economically beneficial behaviour adapted from Lee and Jan (2018)										
I prefer to stay in local accommodations	4.550	1.973	0.926							
I prefer to eat locally grown food	4.450	1.880	0.875							
I generally buy gifts and crafts that are unique	4.590	1.951	0.929							
I try to contribute to local economy	4.390	1.834	0.949							
I always try to buy local souvenirs	4.510	1.943	0.922							
Environmental friendly behaviour adapted from Lee and Jan (2018)										
During my travel I don't disturb flora	5.140	1.744							0.915	
During my travel I don't disturb fauna	5.270	1.638							0.907	
I take responsibility for cleaning the debris (generated by me) at the travel destination	5.020	1.667							0.918	
I try to leave a place clean after my visit	5.430	1.735							0.959	

All the items are measured on a 1 to 7 Likert scale (1 = strongly disagree; 7 = strongly agree)

Table 1 Measurement items (pre-test descriptives and rotated factor loadings)

	Mean	Std. deviation	Component			
			1	2	3	6
All the items are measured on a 1 to 7 Likert scale (1 = strongly disagree; 7 = strongly agree)						
Ecotourism involvement developed from Chiu et al. (2014)						
I am highly motivated to take participation in eco tourism	4.290	2.194			0.853	
I suggest my fellow traveller to travel responsibly	4.100	2.138			0.952	
I try to help travellers to participate in eco tourism	4.140	2.136			0.954	
I encourage my friends and family to take part in ecotourism	4.100	2.119			0.951	
Perceived biosphere value adapted from Shin et al. (2017)						
I strongly feel that I can save the nature	5.160	2.024			0.922	
I respect other species	5.310	1.975			0.952	
I prefer to live in harmony with other species	5.160	1.943			0.954	
I understand that my existence is depended on the balance of the nature	5.180	1.915			0.949	
Perceived environmental usefulness newly developed						
I feel ecotourism engagement will improve the quality of my life	5.040	1.843		0.961		
I feel ecotourism engagement can enrich my job performance	4.940	1.923		0.931		
I feel ecotourism engagement would increase my environmental awareness	4.900	1.836		0.961		
I feel ecotourism engagement would help me in my efforts to save nature	5.000	1.822		0.969		

The final questionnaire was floated in Google Forms and was mailed to different people, who travel a lot to ecotourism destinations using convenience sampling. Repeated reminders resulted in 126 responses having some outliers. Deletion of outliers resulted in 108 usable responses. Table 2 shows the sample demographics.

Table 2 Sample profile

	<i>No</i>	<i>Percentage</i>
Age		
15–25	56	51.85
26–35	39	36.11
36–45	13	12.03
Gender		
Male	46	42.59
Female	62	57.41
Education level		
Higher secondary	5	4.63
UG	60	55.55
PG	43	39.81
Marital status		
Single	63	58.33
Married	45	41.66
Information source		
Mass media	17	15.74
Brochure	6	5.55
Internet	70	64.81
Word of mouth	15	13.88
Travel arrangement		
Self	79	73.14
Non-self	29	26.85
Length of stay		
<3 days	39	36.11
<7 days	63	58.33
<30 days	3	2.77
>30 days	3	2.77
Motivation factor		
Culture	19	17.59
Education	10	9.26
Nature	44	40.74
Health	11	10.185
Personal leisure	24	22.22

The study was executed in India, mainly in southern area encompassing the states of Tamil Nadu, Kerala and Andhra Pradesh, through convenience random sampling during late 2019. Furthermore, several procedures were undertaken to ensure sample representativeness for the study. The study used convenience-based random sampling. Second, several filter questions were included in the questionnaire to ensure appropriate sample participation. For, e.g., the respondents were asked to indicate:

- a How many trips you have made to a nature-based destination in last 2 years?
- b Did you have positive experiences in your trips to a nature-based destination?
- c Tell us some factors that motivates you to visit destinations, beyond saving nature.

The final 108 respondents indicated they have travelled minimum of 5 times to nature-based destinations, have positive experiences and pleasant memories. Furthermore, they indicated cultural exchange, helping destinations through involving in tourism, staying in homestays are the factors that motivated them beyond nature for such trips. The predominance of 15–25 age group in the final sample is justified, as the young generation are most visitors in recent years to destinations as highlighted in several studies (Li et al., 2021). Furthermore, young travellers of the above age group form today a niche segment that is often targeted by destinations for their customised tour packages (Li et al., 2021).

3.2 *Path analysis: hypotheses testing*

The study resorted to Partial Least Squares using RStudio 1.2.5001 (RStudio Team, 2019). The study primarily used the *pls* package (Sanchez et al., 2017) in RStudio (RStudio Team, 2019).

3.2.1 *Measurement model analysis*

The first stage in measurement model evaluation is multi-collinearity assessment through VIF inspection. The study found VIFs between 2.827 to 5.149. With an optimal sample size of 108 responses, and considering the cut-offs 5 (Ringle et al., 2015) and 3.3 (Kock, 2015), it can be inferred that our study did not have any severe collinearity issues. Table 3 shows all the descriptive and other essential statistics for the final measurement items ($N = 108$). The study utilised a bootstrapping with 5,000 subsamples as per recommendations (Hair et al., 2017). Henseler et al. (2016) suggested all reliability estimates (e.g., alpha, Dillon-Goldstein's rho and item-loadings) in PLS to be > 0.7 and our latent constructs very well satisfied this suggested threshold. Hence our measures are reliable. Next, Table 4 portrays the item level communalities and reliability statistics. SCBB1–SCBB4 represent measurement items for socio-cultural beneficial behaviour, EBB1–EBB5 represents items for economically beneficial behaviour, EFB1–EFB4 represent items for environmental-friendly behaviour, EI1–EI4 represent items for ecotourism involvement, BV1–BV4 represent items for perceived biosphere value and EU1–EU4 represents items for perceived environmental usefulness.

Table 3 Item descriptive, loadings and VIFs

<i>Constructs</i>	<i>Indicator</i>	<i>Mean</i>	<i>S.D.</i>	<i>VIF</i>	<i>Loadings</i>	<i>Std. error</i>	<i>t-values</i>	<i>Weights</i>
Perceived biosphere value (BV)	BV1	4.222	2.061	3.072	0.841	0.661	1.272	0.198
	BV2	4.398	1.808	5.149	0.927	0.026	36.070	0.280
	BV3	4.185	1.855	5.106	0.898	0.032	27.975	0.266
	BV4	4.472	1.821	4.226	0.914	0.024	38.565	0.367
Perceived environmental usefulness (EU)	EU1	4.509	2.035	5.014	0.902	0.230	3.922	0.313
	EU2	4.491	1.737	3.319	0.851	0.041	20.655	0.286
	EU3	4.454	1.699	5.075	0.911	0.021	42.770	0.285
	EU4	4.852	1.651	4.501	0.853	0.039	21.816	0.251
Ecotourism involvement (EI)	EI1	3.954	2.020	5.068	0.918	0.014	65.106	0.310
	EI2	4.019	1.663	4.105	0.865	0.032	26.780	0.241
	EI3	3.796	1.616	4.515	0.886	0.026	33.561	0.290
	EI4	4.083	1.708	4.540	0.872	0.026	33.282	0.287
Socio-cultural beneficial behaviour (SCBB)	SCBB1	5.046	2.098	4.843	0.899	0.020	45.635	0.287
	SCBB2	4.481	1.615	4.055	0.894	0.024	37.563	0.283
	SCBB3	4.852	1.908	4.251	0.886	0.031	28.860	0.246
	SCBB4	4.778	1.671	4.554	0.888	0.025	35.951	0.305
Economically beneficial behaviour (EBB)	EBB1	3.917	1.982	3.416	0.862	0.064	13.448	0.222
	EBB2	4.111	1.693	3.362	0.794	0.058	13.785	0.130
	EBB3	4.139	2.002	4.919	0.915	0.032	28.416	0.327
	EBB4	4.306	1.688	3.903	0.860	0.035	24.432	0.220
	EBB5	4.120	1.792	2.827	0.852	0.058	14.589	0.253
Environmental friendly behaviour (EFB)	EFB1	4.306	2.035	3.844	0.886	0.034	26.136	0.247
	EFB2	4.519	1.732	3.945	0.914	0.038	23.927	0.343
	EFB3	4.296	1.720	4.642	0.891	0.039	22.614	0.213
	EFB4	4.491	1.916	4.522	0.923	0.029	32.049	0.300

Table 4 Reliability estimates of constructs

<i>Constructs</i>	<i>Indicator</i>	<i>Communality</i>	<i>Cronbach's alpha</i>	<i>DG rho</i>	<i>First eigenvalue</i>	<i>Second eigenvalue</i>	<i>AVEs</i>
Perceived biosphere value (BV)	BV1	0.707	0.919	0.943	3.220	0.337	0.802
	BV2	0.858					
	BV3	0.806					
	BV4	0.835					
Perceived environmental usefulness (EU)	EU1	0.813	0.902	0.932	3.100	0.387	0.774
	EU2	0.724					
	EU3	0.831					
	EU4	0.728					

Table 4 Reliability estimates of constructs (continued)

<i>Constructs</i>	<i>Indicator</i>	<i>Communality</i>	<i>Cronbach's alpha</i>	<i>DG rho</i>	<i>First eigenvalue</i>	<i>Second eigenvalue</i>	<i>AVEs</i>
Ecotourism involvement (EI)	EI1	0.843	0.908	0.936	3.140	0.335	0.784
	EI2	0.748					
	EI3	0.785					
	EI4	0.761					
Socio-cultural beneficial behaviour (SCBB)	SCBB1	0.808	0.915	0.940	3.180	0.388	0.796
	SCBB2	0.800					
	SCBB3	0.785					
	SCBB4	0.789					
Economically beneficial behaviour (EBB)	EBB1	0.743	0.912	0.934	3.700	0.464	0.736
	EBB2	0.631					
	EBB3	0.838					
	EBB4	0.739					
	EBB5	0.726					
Environmental friendly behaviour (EFB)	EFB1	0.785	0.926	0.948	3.280	0.312	0.817
	EFB2	0.836					
	EFB3	0.793					
	EFB4	0.853					

For assessing validity, the study evaluated for convergent and discriminant validity. With loadings > 0.7 and AVEs for latent factors > 0.5 the convergent validity is met for our study. Furthermore, discriminant validity (Table 5) was also deemed satisfactory, based on Fornell and Larcker (1981)'s criterion.

Table 5 Discriminant validity assessment

<i>Discriminant validity: Fornell-Larcker criteria</i>						
	<i>BV</i>	<i>EU</i>	<i>EI</i>	<i>SCBB</i>	<i>EBB</i>	<i>EFB</i>
BV	0.802					
EU	0.052	0.774				
EI	0.085	0.112	0.784			
SCBB	0.037	0.200	0.190	0.796		
EBB	0.023	0.000	0.078	0.049	0.736	
EFB	0.073	0.009	0.069	0.006	0.023	0.817

Note: Above – AVEs; below – squared correlations.

Table 6 Item cross-loadings

	<i>PBV</i>	<i>PEU</i>	<i>ECOI</i>	<i>SCB</i>	<i>ECB</i>	<i>ENB</i>
BV1	0.841	0.076	0.243	0.154	0.163	0.166
BV2	0.927	0.220	0.231	0.177	0.145	0.304
BV3	0.898	0.186	0.242	0.132	0.130	0.206
BV4	0.914	0.277	0.314	0.208	0.120	0.269
EU1	0.251	0.902	0.280	0.415	0.039	0.176
EU2	0.126	0.851	0.319	0.357	-0.119	0.071
EU3	0.218	0.911	0.275	0.397	0.005	0.103
EU4	0.203	0.853	0.312	0.405	0.006	-0.044
EI1	0.345	0.343	0.918	0.358	0.233	0.272
EI2	0.137	0.331	0.865	0.373	0.147	0.220
EI3	0.218	0.233	0.886	0.416	0.330	0.254
EI4	0.310	0.287	0.872	0.401	0.263	0.177
SCBB1	0.238	0.429	0.374	0.899	0.217	0.160
SCBB2	0.152	0.383	0.408	0.894	0.172	0.012
SCBB3	0.170	0.390	0.298	0.886	0.201	0.111
SCBB4	0.126	0.391	0.460	0.889	0.197	-0.003
EBB1	0.074	-0.081	0.150	0.072	0.862	0.113
EBB2	0.129	0.088	0.223	0.143	0.794	0.186
EBB3	0.179	-0.006	0.334	0.307	0.915	0.165
EBB4	0.202	0.010	0.239	0.182	0.860	0.166
EBB5	0.061	-0.049	0.215	0.179	0.852	0.039
EFB1	0.265	0.050	0.230	0.037	0.120	0.886
EFB2	0.240	0.145	0.243	0.057	0.115	0.914
EFB3	0.286	0.028	0.213	0.121	0.139	0.891
EFB4	0.208	0.086	0.253	0.071	0.170	0.923

3.2.2 Structural model assessment

Based on recommended guidelines (Henseler et al., 2016), the effect sizes and R-square are used to evaluate the structural model. The model explained 5.19 % variance in EU, 16.19 % variance in EI, 29.2 % in SCBB, 9.21 % in EBB and 6.84% variance in EFB. Considering an optimal sample size of 108 responses and model complexity, the metrics seemed decent. Figure 7 shows the final results.

Table 7 Path model testing results

<i>Proposed associations</i>	<i>Path values</i>	<i>Std. error</i>	<i>t-values</i>	<i>p-value</i>	<i>Supported</i>
H1 Perceived biosphere value → Perceived environmental usefulness	0.228	0.095	2.410	0.018	Yes
H2 Perceived biosphere value → Ecotourism involvement	0.228	0.092	2.480	0.015	Yes
H3 Perceived environmental usefulness → Ecotourism involvement	0.284	0.092	3.090	0.003	Yes
H4 Perceived environmental usefulness → Socio-cultural beneficial behaviour	0.338	0.087	3.880	0.000	Yes
H5 Perceived environmental usefulness → Economically beneficial behaviour	-0.127	0.099	-1.290	0.201	No
H6 Perceived environmental usefulness → Environmental friendly behaviour	0.007	0.100	0.066	0.948	No
H7 Ecotourism involvement → Socio-cultural beneficial behaviour	0.323	0.087	3.700	0.000	Yes
H8 Ecotourism involvement → Economically beneficial behaviour	0.322	0.099	3.260	0.001	Yes
H9 Ecotourism involvement → environmental friendly behaviour	0.259	0.100	2.590	0.011	Yes

Table 8 Overall effects summary

<i>No</i>	<i>Relationships</i>	<i>Direct</i>	<i>Indirect</i>	<i>Total</i>	<i>Std. error</i>	<i>t-values</i>
1	BV → EU	0.2278	0.0000	0.2278	0.1031	2.210
2	BV → EI	0.2277	0.0647	0.2924	0.0982	2.979
3	BV → SCBB	0.0000	0.1715	0.1715	0.0576	2.977
4	BV → EBB	0.0000	0.0651	0.0651	0.0497	1.310
5	BV → EFB	0.0000	0.0773	0.0773	0.0452	1.710
6	EU → EI	0.2840	0.0000	0.2840	0.1117	2.543
7	EU → SCBB	0.3384	0.0917	0.4300	0.0971	4.428
8	EU → EBB	-0.1270	0.0913	-0.0357	0.1240	-0.288
9	EU → EFB	0.0066	0.0736	0.0802	0.1084	0.740
10	EI → SCBB	0.3228	0.0000	0.3228	0.0990	3.261
11	EI → EBB	0.3216	0.0000	0.3216	0.0851	3.779
12	EI → EFB	0.2593	0.0000	0.2593	0.0961	2.698
13	SCBB → EBB	0.0000	0.0000	0.0000	0.0000	Na
14	SCBB → EFB	0.0000	0.0000	0.0000	0.0000	Na
15	EBB → EFB	0.0000	0.0000	0.0000	0.0000	Na

4 Discussion

While the existing studies did not undersign the role of perceived biosphere value for ensuring environmental usefulness and ecotourism involvement, our study contributed through addressing the concerned research gap. The study explored the role of perceived biosphere value in the development of perceived environmental usefulness and ecotourism involvement. The study further explored the impact of perceived environmental usefulness and ecotourism involvement in the generation of socio-cultural beneficial behaviour, economically beneficial behaviour and environmental friendly behaviour. Existing studies highlighted the need of conserving the environment in general, however the need for exploring tourists interests in saving the environment required empirical exploration (Adongo et al., 2018). In this regard, our study adds that more the tourists feel that saving the natural resources would aid in achieving sustainability objectives (Wu et al., 2021).

The study found support for a positive effect of BV on the EU. This suggested that as individuals realise the benefits of the biosphere, they are more likely to engage in environmental activities. Furthermore, the effect of BV on EI was also found to be positive, implying that with a higher perceived value of biosphere one is more likely to engage in ecotourism activities. As individuals realise the benefits of saving the environment, they are also more likely to engage in ecotourism activities. Hence this suggests that it's important for individuals to realise the value of the biosphere and the importance of the environment in overall sustainability. While extant studies suggest that moral obligation enhances tourist's environment conservation efforts (Wu et al., 2021), our study further adds that greater the perceived value of saving environment for tourists, higher would be their motivation to save and conserve a destination environment. This would be a spontaneous process as they would want to save resources for future generations. As a result, perceived value of natural resources contributes in environment conservation and suggests further optimal usage of natural resources. For, e.g., Santana et al. (2019) found that awareness campaigns suggesting tourists to save resources leads to optimal water usage at destinations. This is also supported by our finding that higher perceived environmental usefulness would also enable destination managers to expect appropriate behaviours from tourists in terms of optimal natural resource usage, environmental conservation, and contribution to economic development.

Environmental usefulness signifies the extent an individual believes that ecotourism participation would aid one in conserving, protecting a destination environment from destruction. In this regard, our study showed that with higher perceived environment usefulness, tourists are more likely to get more engaged in protecting environment, reporting to concerned authorities thereby resulting in positive environmental performance, while also contributing towards the economic development of the destination. This is in line with Coles et al. (2017) that found that that there is a positive association between economic and environmental performance. However, the study suggested that with higher ecotourism involvement, individuals are more likely to exhibit socio-cultural beneficial behaviour. Destination managers can design environmental awareness programs in their tour packages, so that tourists are encouraged more to know the about the destination specific fauna and flora. This would further motivate them to dispose off wastes, while enjoying nature at destinations (Han et al., 2018; Liedtke et al., 2013). Yusof et al. (2017) found that green practices by hotels have a prominent impact

in attracting customer's attention and building loyalty among new ones. This in line with our studies as it suggests that observing environmental friendly practices would eventually motivate tourists to make eco-friendly decisions and choices.

Furthermore, such realisation of the importance of the environment also aids in assuring individuals to exhibit socio-cultural beneficial behaviour. This is because the realisation of saving our environment also possibly make one realise the essence of maintaining a well-behaved society in every form. Studies have reported that tourism is an opportunity for individuals to connect with local communities for a cultural know-how (Hurst et al., 2020). Accordingly, eco-tourists have a greater motivation for knowing new cultures, while ensuring that their visit to a destination does not result in any cultural conflict. This in turn helps in positive experiences, resulting in pleasant memories for the tourists that subsequently aids in a positive destination image formation (Mandal et al., 2021). Such positive destination image aided with pleasant memories are the key drivers for encouraging eco-tourists for a revisit (Mandal et al., 2021; Nguyen et al., 2021). Furthermore, the findings suggested that higher environmental usefulness may not enhance economically beneficial behaviour and environmental friendly behaviour. A similar finding is indicated by Geissinger et al. (2019) in their study- sharing economy may not always result in economic profits, while it aids in reducing adverse impacts on the natural resources. Furthermore, an individual may have environmental concern but may not have the capacity to sustain environment, while satisfying his basic necessities of life (Hong and Guo, 2019). This may be due to the inertness of the individual towards this kind of realisation that may not be sufficient to make one behave appropriately.

5 Implications, limitations and future research

The study has several implications for academicians and researchers. First, the study suggested that perceived biosphere value is a prominent enabler for raising environmental awareness in tourism and hospitality. Without it, the development of a strong environmental awareness might be difficult. Hence our study suggests researchers explore several theoretical lenses for example theory of planned behaviour (Ajzen, 1991), the relational view (Dyer and Singh, 1998) and several others to explore how dyads and triads in a service supply chain respond to save the environment. Hence academicians must explore alternate theories for examining other variables that may affect the development of perceived biosphere value.

For managers, our study offers several implications. First, the study suggests managers understand the importance of perceived biosphere value and ecotourism involvement in developing appropriate behaviour from the tourists. Accordingly, destination event planners and agencies should cooperate with local communities to organise events/ programs in every tour package to raise the awareness of saving the environment while participating in tourism. Ecotourism suggests tourists take part in several recreation and leisure activities at a destination while providing minimum damage to the environment. In this regard, destination planners need to strategise events regarding environmental awareness and ecotourism so that they go well with the main tour packages.

Second, the study suggests managers that tourists must be engaged to a greater extent so that they are interested in purchasing local things that can help boost the economy of the region. Third, managers must also understand that tourists must be actively involved

in ecotourism so that they are ready to learn and exchange cultural beliefs and view with the residents and behave in such a way to provide minimal damage to the environment. Fourth, the study also suggested managers raise environmental awareness among the tourists so that they behave in a way that is acceptable by the local community. Hence, it is very important to make the tourists understand the code of conduct and behaviour that is expected from them at a particular destination. This would in turn help the tourists also to have a better tourism experience while actively engaged in environmental friendly behaviour.

The study also has its limitations, while it showed the importance of perceived biosphere value and ecotourism involvement as prominent enablers of appropriate behaviour from tourists at destinations. The study collected perceptual responses from 108 tourists that are interested to participate in ecotourism. While the sample size is deemed adequate from a statistical standpoint, future research is needed to further validate and extend the proposed model. Future research can execute a case study on a specific destination with a set of tourists understanding how their ecotourism involvement helps in developing the different kinds of behaviour, i.e., socio-cultural beneficial behaviour, economically beneficial behaviour and environmental friendly behaviour. This would also help to further understand, using different behavioural theories how involvement in ecotourism can play a crucial part in safeguarding the environment of a destination while reaping benefits from tourism at such destinations. Second, the study did not fully explore the antecedents of perceived biosphere value, perceived environmental usefulness and ecotourism involvement. Future studies can use different theoretical lenses to identify suitable variables that can act as prominent enablers. Third, the young travellers are a majority in the final sample. Future studies can focus on other age groups to enhance generalisability.

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