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Understanding Ecotourist Behavior: The Case of Forest-based Ecotourism in Sri Lanka

Ecotourism is a fast-evolving sector in tourism. As consumers of ecotourism products become more diverse, ecotourism operators are facing the difficulty of meeting the needs and expectations of a heterogeneous client base. Therefore, a thorough understanding of ecotourist behavior has become important from the ecotourism management and marketing perspectives. Using forest-based recreational areas in Sri Lanka as the geographic focus, this study proposes an ecotourism behavioral model based on Ajzen's Theory of Planned Behavior, incorporating knowledge and satisfaction as predictors of ecotourism behavior. Results suggest that knowledge, attitudes, social influence and perceived behavioral control are important determinants of an individual's intention to participate in ecotourism, and his/her actual ecotourist behavior. Satisfaction plays a key mediating role in the model by bridging the four determinants: knowledge, attitudes, social influence and perceived behavioral control with behavioral intentions. Knowledge had a significant and positive direct effect on behavioral intentions and behavior. Implications of the study are discussed in the context of ecotourism provider planning and management actions and strategies.

Key words: Visitors, attitudes, motivations, satisfaction, theory of planned behavior

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Introduction

Tourism scholars attribute the emergence of alternative tourism models such as nature-based tourism, cultural tourism, adventure tourism, and ecotourism to significant negative impacts of mass tourism on the environment, economy, and socio-cultural elements of society (Goodwin, 1996; Fennell, 2003). Of these alternative tourism models, ecotourism has generated distinctive interest among tourism professionals because of its potential as a sustainable alternative to mass tourism (Sirakaya & McLellan, 1998). The literature provides numerous definitions for ecotourism; the International Ecotourism Society (TIES) defines ecotourism as the ‘‘responsible travel that conserves natural environments and sustains the well-being of local people’’ (TIES, 2010).

As consumers of ecotourism products become more diverse, ecotourism operators are facing the difficulty of meeting sophisticated expectations of their clients. As such, a deep understanding of ecotourist behavior has become important for ecotourism operators to better serve the ecotourism market segment. Key elements are an understanding of determinants of ecotourism behavior and how these key determinants influence visitor future engagement in ecotourism. This enhanced market knowledge could enable ecotourism operators to optimize tour experience, improve revenue generation and be better prepared to tailor educational materials to clients. This study proposes an ecotourism behavioral model in the context of forest-based recreational areas in Sri Lanka based on Ajzen's (1991) Theory of Planned Behavior (TPB), and incorporate knowledge and satisfaction as predictors of ecotourism behavior. We suggest that the model may be useful in operationalizing its constructs in other settings.

Conceptual Framework for Hypotheses

In marketing, it is largely accepted that successful product/service development is based on a foundation of conducting customer market research in order to satisfy their needs

and wants. In the context of ecotourism, predicting and influencing ecotourist behavior is one of the key tasks of ecotourism operators, often by assessing information on recreational participation and demand (Lee, 2007). According to Stamboulis and Skayannis (2003), tourism experiences are formed through a process of visiting, learning and enjoying activities in a unique environment. Tourism experience encompasses behavior, perception, attitude, cognition and emotions that can be either expressed or implied (Oh *et al.* 2007). A better understanding of the nature of ecotourism experiences allows tour operators to tailor their services or tourism products to the unique demands of their clients.

Tourism literature traditionally cites three stages of a tourism experience; before, during, and after travel. Aho (2001) expanded the notion of tourism experience to include seven stages: orientation, attachment, visiting, evaluation, storing, reflection, and enrichment. We suggest that different types of nature-based experiences can exhibit different stages, based on factors such as experience cost, experience physical difficulty or experience psychological intensity. In this line of thinking, Borrie and Roggenbuck (2001) suggest that a wilderness experience consists of multiple phases which includes anticipation/planning, travel to, participation, travel back, and recollection phases. An ecotourism experience can advance a person's intellectual curiosity, understanding, and appreciation of the natural and cultural environment. Since behavior is an essential component of tourism experience, a thorough understanding of ecotourist behavior, and the precursors for these behaviors, is important from the perspective of ecotourism operators to provide optimal tour experiences (Perera & Vlosky, 2013).

Tourism scholars have used numerous behavioral theories to explain tourism/recreational behavior. Fishbein and Ajzen (1975) developed the Theory of Reasoned Action (TRA) which theorizes that human behavior is influenced by behavioral intentions, attitudes, and subjective norms. The concept of "behavioral intention" is the focus of TRA.

Behavioral intention is an individual's intention to perform a specific act, or the motivation necessary to engage in a particular behavior. TRA suggests that a person's behavioral intention is a function of attitudes about the behavior and subjective norms. It was originally developed to explain behaviors that are under complete volitional control. However, many behaviors, such as recreational activities require integration of both internal and external influences and, as such, are not under complete volitional control; TRA has limited validity in predicting recreational behaviors (Ajzen, 1991).

To overcome the limitations of TRA model, Ajzen (1985, 1991) proposed the Theory of Planned Behavior (TPB), a modification of the TRA. TPB added the construct of perceived behavioral control to explain an individual's perceived ease or difficulty in performing a behavior. In this expanded theory, Ajzen (1985) suggested that three types of beliefs drive human behavior: behavioral beliefs, normative beliefs, and control beliefs. Beliefs about likely outcomes of a particular behavior weighted by evaluations of these outcomes form behavioral beliefs. Beliefs about expectations of significant others weighted by an individual's motivation to comply with significant others' expectations are the foundation for normative beliefs. Beliefs about factors that can facilitate or hinder a certain behavior, and the perceived influence of these factors make up control beliefs. Behavioral, normative, and control beliefs are the respective precursors of attitudes toward the behavior, subjective norms, and perceived behavioral control. Favorable attitudes, subjective norms and higher degree of perceived behavioral control lead to stronger behavioral intention and motivation.

Since its emergence, tourism scholars have used TPB to predict tourism behavior under different scenarios with varying degrees of success. For instance, Ajzen and Driver (1992) applied TPB in a study of leisure choices of college students; attitudes, subjective norms, and perceived behavioral control were found to be correlated to leisure behavior as

hypothesized. Lam and Hsu (2004) tested the fit of TPB with tourism behavior of potential travelers from Mainland China to Hong Kong. They found a moderate fit between data and the TPB model, and concluded that TPB model moderately explained traveling intention. In an attempt to further improve the predictability of leisure behavior using TPB, Lee (2007) added satisfaction as a mediating variable to develop an ecotourism behavioral model for national forest recreation areas in Taiwan. Lee (2007) concluded that subjective norms had the strongest effect on satisfaction, followed by perceived behavioral control and attitude. More importantly, Lee (2007) identified satisfaction and behavioral intention as key mediating variables in the improved model.

Satisfaction is a dominating constructs that has been extensively studied by researchers in tourism marketing (Baker & Crompton, 2002; Lee, 2007; Perera & Vlosky, 2013). In the context of tourism and leisure services, past studies have attempted to discriminate between quality and satisfaction based on differences between quality of opportunity, and quality of experience (Compton & Love, 1995). The quality of opportunity or performance refers to attributes of a service those are under service supplier's control while, quality of experience or satisfaction implies attributes that are under control of the visitor (Baker & Crompton, 2002). In other words, satisfaction is a psychological outcome or emotional state of mind an individual has after a recreational experience. Past studies suggest higher levels of satisfaction lead to positive behavioral intentions and behaviors (Baker & Crompton, 2002; Tian-Cole et al., 2002; Lee, 2007).

Knowledge is also an important topic in consumer research that received increased scholarly attention in the recent past. Knowledge is especially tied to information search behavior (Gursoy & McCleary, 2004; Dodd et al., 2005). Prior knowledge plays a key role in information acquisition, search, processing, and decision making (Brucks, 1985; Raju et al., 1995). Literature in consumer research describes three distinct types of knowledge; subjective

knowledge, objective knowledge, and usage experience (Brucks, 1985; Raju et al., 1995; Senevirathna & Perera, 2014). Brucks (1985) described these three concepts as "an individual's perception of how much he/she knows", "the amount, type, or organization of what an individual actually has stored in memory" and "amount of purchasing or usage experience with the product" respectively. According to Brucks (1985), usage experience is less directly linked to behavior. Despite being distinct concepts, these are positively correlated with each other (Raju et al., 1995).

In the context of tourism, an individual's familiarity with a destination may reflect tourists' subjective knowledge while his/her expertise represents the objective knowledge of the destination (Gursoy & McCleary, 2004). The concepts of subjective and objective knowledge have been examined in relation to individual's ecological behaviors. An empirical study by Ellen (Ellen, 1994) on a group of environmentally concerned individuals found low level of objective knowledge (what they actually know) associated with their pro-environmental behavior. Objective knowledge having non-significant relationship with subjective knowledge suggested that individuals make pro-environmental decisions even without having the necessary knowledge to make sound ecological decisions. This might indicate social influences on an individual's ecological behaviors.

The concept of knowledge is fundamental to the understanding of consumer behavior, and is interwoven with many consumer behavior theories (McNeal & McDaniel, 1981). The knowledge a person has about a particular behavior can also play a key role in that person's likelihood of engaging in the behavior under investigation. The consumer acquires knowledge about a product over time and, his/her purchase decision said to be influenced by the level of knowledge he/she has on the product (Berger & Mitchell, 1989). The higher the knowledge a consumer has on a product, the higher the likelihood that the consumer makes the correct behavioral decision. Knowledge is believed to have direct effects on attitudes,

beliefs, behavioral intention, and behavior itself, and existence of such relationships are buttressed by numerous studies (Gussow & Contento, 1984; Raju et al., 1995).

Based on this theoretical framework, present study attempts to develop an ecotourism behavioral model of natural forest recreation areas, integrating satisfaction as intermediary variable and knowledge as a formative variable. The hypothesized model is illustrated in Figure 1. The proposed model is a modification of Ajzen's (1991) TPB, and an extension of Lee's (2007) work. While examining the mediating role of "satisfaction", it is attempted to improve the predictability of ecotourism behaviour and behavioural intentions by incorporating "knowledge" as main construct. Accordingly, the model is based on 11 basic assumptions. The alternative hypotheses correspond to each hypothetical relationship are listed below.

H_1: Knowledge positively influences attitudes

H_2: Knowledge positively influences satisfaction

H_3: Knowledge positively influences behavioral intentions

H_4: Knowledge positively influences behaviors

H_5: Attitudes positively influences satisfaction

H_6: Social influence positively affects satisfaction

H_7: Perceived behavioral control positively influences satisfaction

H_8: Perceived behavioral control positively influences behavioral intentions

H_9: Perceived behavioral control positively influences behaviors

H_{10}: Satisfaction positively influences behavioral intentions

H_{11}: Behavioral intentions positively influence behavior

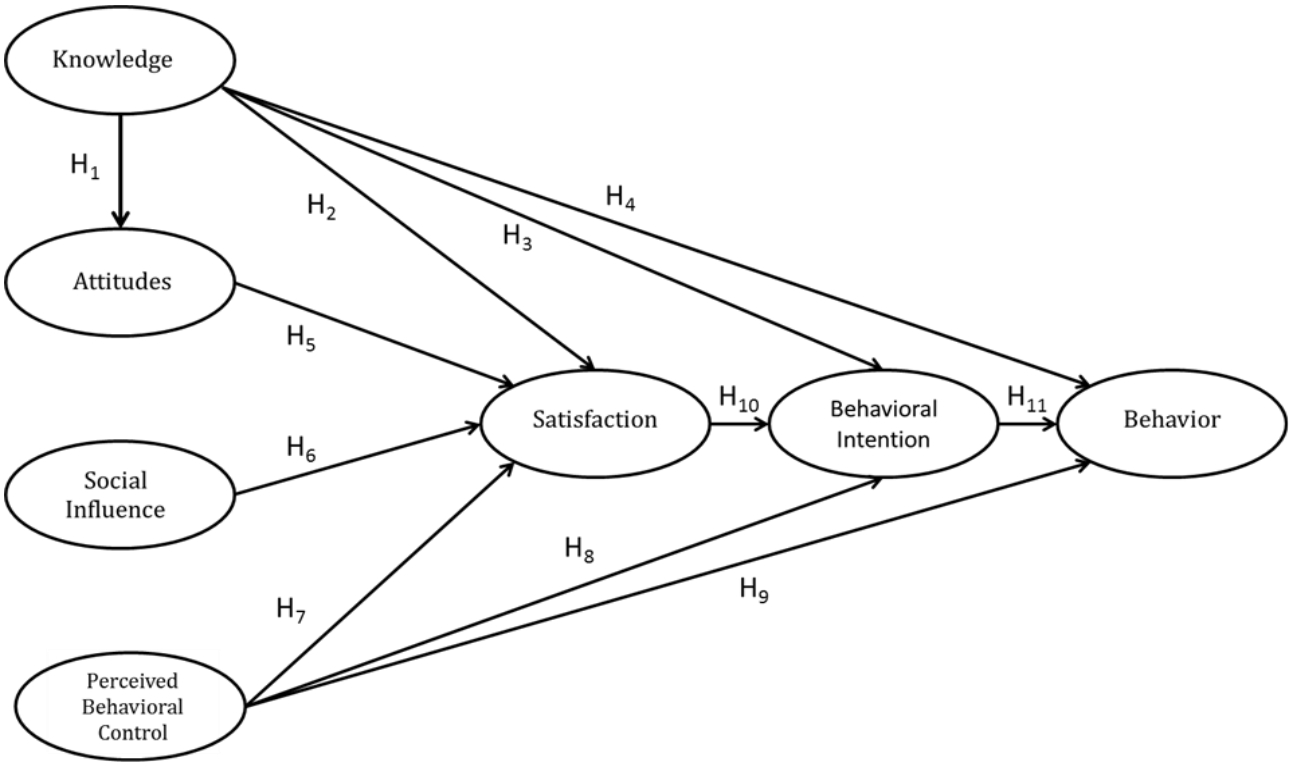

Figure 1: The Hypothesized Ecotourism Behavioral Model

Methodology

Questionnaire design

A structured questionnaire was the primary research instrument. All model constructs except satisfaction were operationalized using multiple items. These items were measured using a 7-point Likert scale anchored by 1 = strongly agree to 7 = strongly disagree. Satisfaction was measured using single item in the questionnaire. Past literature suggests that overall satisfaction can be effectively measured using a single item (Tian-Cole *et al.*, 2002; Yuan *et al.*, 2008).

Sampling and Data Collection

Four forest-based recreational destinations in Sri Lanka were chosen as study sites based on tourism traffic records. The study sites were Sinharaja Forest Reserve, Horton Plains National Park, Yala National Park, and Minneriya National Park. During the period of September 2010 to January 2011, 340 questionnaires were administered through visitor

intercepts at each site (1,360 total). Visitors over 18 years of age were provided with the questionnaire at the forest recreation area exits which they completed and returned before leaving the site. Data were collected during week-ends where highest number of visitors was expected. To minimize selection bias, systematic random sampling was used with third visitor being asked to participate. Visitors who agreed to participate were asked to complete the questionnaire by themselves in the presence of a field assistant who could provide any clarification on items in the questionnaire if necessary. Those who declined to participate were treated as non-respondents.

Results

Data Preparation for Structural Equation Modelling

Of the 1,360 individuals intercepted, 547 participated in the survey. After eliminating invalid, incomplete, and unreliable responses, there were 525 valid or usable questionnaires for an adjusted response rate of 38.6%. Data analysis consisted of initial assessment of the validity of measurement constructs using Principal Component Exploratory Factor Analysis. This was followed by Structural Equation Modeling (SEM) procedure using Amos® to investigate the relationships among model constructs.

Factor Analysis

Knowledge, attitudes, social influence, perceived behavioral control, overall satisfaction, behavioral intentions, and behavior were the constructs included in the hypothetical model. The construct “knowledge” was operationalized by six items in the questionnaire, labeled K1 to K6 in Table 1. To evaluate the validity and reliability of these six items in measuring the latent construct “knowledge”, a principal component factor analysis with varimax rotation was performed. The Kaiser-Meyer-Olkin (KMO) test statistic

of 0.851 suggested the sampling adequacy to perform a factor analysis while significance (p=0.00) for Bartlett's test of sphericity indicated correlated measured items.

According to Hair *et al.*(2005), factor loadings above 0.6 indicate independent variables identified a-priori are well represented by a particular factor, while variables with factor loadings below 0.4 represent poor representation of independent variables. Hence, for this study a lower level of 0.5 was used as the cutoff margin. Results confirmed that six items used to measure knowledge are unifactorial, which means the six items selected to represent "knowledge" indeed measure the same construct. To assess the reliability of selected items in measuring the latent model construct, the Cronbach's alpha score was examined. It is generally accepted that a value greater than 0.7 for Cronbach's alpha indicates sufficient scale reliability (Cortina, 1993; Gliem & Gliem; 2003). As indicated in **Table 1**, the Cronbach's alpha exceeded 0.7 for the set of six measured items.

Table 1: Validity and Reliability for Items used to Represent Knowledge

Measurement item	Mean ± Standard Deviation	Factor Loading	Cronbach's Alpha
Ecotourism..			
Minimizes the impact on natural environment (K1)	5.44± 1.14	0.816	0.836
Supports environmental conservation (K2)	5.24± 1.11	0.794	
Promotes sustainability (K3)	5.95± 0.98	0.755	
Builds environmental and cultural awareness (K4)	5.64± 0.95	0.741	
Provides financial incentives to locals (K5)	5.59± 1.13	0.707	
Brings a positive experience for visitors and hosts (K6)	5.67± 0.87	0.630	

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.851
Bartlett's Test of Sphericity $\chi^2 = 1067.6, p = 0.000$

Five items (labeled A1 to A5) were selected to operationalize the construct "attitudes" (**Table 2**). All measurement items except A5 had factor loadings greater than 0.5, indicating a good representation. Hence, the measurement item A5 was excluded from further analysis. Remaining items collectively produced a Cronbach's alpha score of 0.845 confirming sufficient scale reliability.

Table 2: Validity and Reliability for Items used to Represent Attitudes

Measurement item	Mean ± Standard Deviation	Factor Loading	Cronbach's Alpha
Participation in ecotourism is…			
Environmentally favorable (A1)	6.20 ± 0.94	0.861	0.845
Interesting (A2)	6.15 ± 0.93	0.843	
Educational (A3)	6.34 ± 0.84	0.838	
Enjoyable (A4)	6.34 ± 0.81	0.756	
Affordable (A5)	3.62 ± 1.20	0.161[d]	

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.786
Bartlett's Test of Sphericity $\chi^2 = 874.1, p = 0.000$
[d] *Items with factor loadings below 0.5 were deleted*

Similarly, the latent construct "social influence" was operationalized by five measurement items labeled SI1 to SI5 in Table 3, while the latent construct "perceived behavioral control" was measured using a set of four items. These are labelled as PBC 1 to PBC 4 in Table 4. As summarized in **Table 3** and **Table 4**, factor analysis results and Cronbach's alpha scores indicated that the two sets of measurement items employed to measure social influence and perceived behavioral control performed validly and reliably in measuring their respective latent constructs.

Table 3: Validity and Reliability for Items used to Represent Social Influence

Measurement item	Mean ± Standard Deviation	Factor Loading	Cronbach's Alpha
My family members would think I should participate in ecotourism (SI1)	5.12 ± 1.30	0.773	0.779
My colleagues would think I should participate in ecotourism (SI2)	4.92 ± 1.10	0.746	
People who are important to me would approve participate in ecotourism (SI3)	5.30 ± 0.96	0.718	
The popular opinion in the society is to choose ecotourism (SI4)	5.42 ± 1.06	0.716	
My friends would think I should participate in ecotourism (SI5)	5.25 ± 1.11	0.695	

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.801
Bartlett's Test of Sphericity $\chi^2 = 635.3, p = 0.000$

The construct "future behavioral intentions" was initially measured using a set of six items. Exploratory factor analysis conducted to assess the validity of measurement items produced two distinct factors with measurement items "interest to participate in ecotourism in

the future", "willingness to participate in ecotourism in one year" "likelihood of participating in ecotourism in one year" and "willingness to become a member of an environmental conservation organization" loading on one factor. This factor was named as "future involvement in ecotourism". Since the measurement item "willingness to become a member of an environmental conservation organization" had a poor loading on the factor (factor loading of 0.438) it was removed from further analysis. A composite average score was computed for the new factor by taking the arithmetic mean across all contributing items.

Table 4: Validity and Reliability for Items used to Represent Perceived Behavioral Control

Measurement item	Mean ± Standard Deviation	Factor Loading	Cronbach's Alpha
To participate in ecotourism, I have			
Enough money (PBC 1)	5.16 ± 0.97	0.807	0.800
Enough information (PBC 2)	5.01 ± 0.88	0.793	
Enough stamina (PBC 3)	5.47 ± 0.87	0.789	
Enough time (PBC 4)	5.25 ± 0.86	0.775	

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.791
Bartlett's Test of Sphericity $\chi^2 = 603.9$, $p = 0.000$

To recheck the performance of the new composite variable along with other two measured variables, a factor analysis was performed. Yielding of a unifactorial solution with satisfactory factor loadings indicated that the three items measured the same construct (**Table 5**). To measure the onsite behavior of respondents, a set of 9 statements, mainly adopted from Lee (2007) was utilized in the questionnaire. The factor analysis generated a unifactorial solution which is an indication of the validity of selected items. All measurement items had sufficiently large factor loadings with the exception of "supported the local community through spending money at local stores/shops", which was removed from further analysis (**Table 6**). Rest of the measurement items proved to be reliable in measuring their respective latent model construct.

Table 5: Validity and Reliability for Items used to Represent Future Behavioral Intentions

Measurement item	Mean ± Standard Deviation	Factor loading	Cronbach's alpha
Likelihood of recommending the destination to others (FB 1)	5.45 ± 1.03	0.875	0.716
Likelihood of revisiting this destination in the future (FB 2)	4.39 ± 1.12	0.849	
Future involvement in ecotourism(FB 3)	5.67 ± 1.01	0.662	

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.610
Bartlett's Test of Sphericity $\chi^2 = 370.3, p = 0.000$

Table 6: Validity and Reliability for Items used to Represent Behavior

Measurement item	Mean ± Standard Deviation	Factor Loading	Cronbach's Alpha
Observed nature and wildlife thoroughly (B1)	4.67 ± 1.80	0.863	0.883
Helped to maintain the local environmental quality (B2)	5.54 ± 1.82	0.815	
Did not damage plants (B3)	5.68 ± 1.20	0.808	
Followed the instructions/guidelines provided before the tour (B4)	5.36 ± 1.25	0.807	
Wore clothes that were appropriate for a forest ecosystem (B5)	4.11 ± 1.74	0.789	
Did not feed or disturbed wildlife (B6)	5.97 ± 1.01	0.747	
Paid attention to the interpretation (B7)	5.00 ± 1.52	0.724	
Stayed at an eco-lodge/eco-friendly hotel (B8)	3.02 ± 2.45	0.655	
Supported the local community through spending money at local stores/shops (B9)	4.29 ± 1.65	0.499	

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.921
Bartlett's Test of Sphericity $\chi^2 = 2430.1, p = 0.0001$

Structural Equation Modelling - Assessing the Measurement Model

SEM requires adjustments for missing values, and assumes multivariate normality, linear relationships among variables, absence of multi-collinearity, and outliers in data. Hence, usable questionnaires were further screened for missing values, outliers, and normality. Mean substitution is recommended if the percentage of missing values for a variable is less than 10 percent (Roth, 1994). Therefore, missing values were substituted with the mean of the respective variable. In order to diagnose for outliers, the Mahalanobis distance (D^2) statistic was used. After discarding significant outliers, the sample size was reduced to 512 valid questionnaires. The fit indices estimates for the initial model are summarized in **Table 7**. It indicates mixed evidences for model fit with only five out of nine

selected model fit indices meeting their acceptance criteria. This suggested that the initial model could be substantially improved.

Table 7: Fit Indices for the Initial Structural Model

Indices	Index value	Decision criteria	Decision
Chi-square test			
Chi-square	735	p>0.05	Rejected
Chi-square /d.f.	2.17 (735/339)	<5	Accepted
Goodness of fit indices			
GFI	0.905	>0.9	Accepted
AGFI	0.887	>0.9	Rejected
PGFI	0.756	>0.5	Accepted
NIF	0.871	>0.9	Rejected
Alternative indices			
CFI	0.925	>0.9	Accepted
RMSEA	0.048	<0.05	Accepted
RMR	0.092	<0.05	Rejected

In order to improve the model fit, standardized residual patterns and parameter significant tests for indicator variables were examined. All parameters were significant at *p<0.001* level suggesting that indicator variables selected to measure latent model constructs are indeed good indicators. In sufficiently large samples, standardized residual covariances of a correctly specified model should be less than two in their absolute values (Arbuckle, 2009). However, observation of standardized residual patterns revealed that comparatively larger standardized residuals are associated with five indicator variables. These indicators included "brings a positive experience for visitors and hosts" (K6), "enjoyable" (A4), "future involvement in ecotourism" (FB3), "wore clothes that were appropriate for a forest ecosystem" (B5), and "stayed at an eco-lodge/eco-friendly hotel" (B8). Removal of these indicator variables suggested substantial improvement in model fit.

The indicator A4 showed larger standardized residual covariances especially with indicators of satisfaction, perceived behavioral control, future behavioral intentions and behavior. Enjoyment is a key motivational aspect of any recreational experience. Hence it can

be expected that a dominant premise such as enjoyment to have an infusing effect on other dimensions of recreational behavior. On this ground, removal of the indicator A4 is justified by the researcher. The indicator FB3 exhibited larger standardized residual covariances especially with indicators of behavior. Individuals with genuine interest in ecotourism are likely to exhibit environmentally desired behavior. FB3 measured the interest and likelihood of future participation in ecotourism, and therefore, it can be expected that individuals to give similar responses for indicators of future behavioral intentions and behavior. Larger standardized residual covariances associated with K6, B5, and B8 are unexplained, and may be due to random associations. All regression coefficients estimated for the initial model were significant at either at $p<0.05$ level, except the path from knowledge to satisfaction. Modification indices supported the deletion of this path from the model, while it suggested the addition of a new path from knowledge to perceived behavioral control.

The re-specified model was tested, and its convergent and discriminate validity were assessed. According to Hair et al. (2005), factor loadings greater than 0.4 for observed variables indicate good convergence. Factor loadings exceeded 0.4 for all indicator variables used in the re-specified model (**Table 8**). In addition, t-statistics in excess of 2 for parameter significance tests indicated that all parameter coefficients were significant at $p<0.001$ level.

Discriminant validity was examined by comparing the AVE for latent constructs with the estimated squared correlation between all the other model constructs (Fornell and Larcker, 1981). If the AVE score is greater than the squared correlations between other latent model constructs, it indicates satisfactory discriminant validity. **Table 9** compares AVE of each latent construct with squared correlations between every other latent constructs. Based on the evidence, all latent constructs met the criterion for adequate discriminant validity.

Table 8: Convergent and Discriminant Validity of Measurement Scales for the Final Model

Variable/Measurement item	Factor Loading	Standardized Factor Loading	t-value	AVE	CR
Knowledge					
K1	1.000	0.812	_	0.487	0.825
K2	0.853	0.711	15.142		
K3	0.714	0.672	14.676		
K4	0.641	0.621	12.818		
K5	0.806	0.657	14.143		
Attitudes					
A1	1.000	0.883	_	0.644	0.843
A2	0.866	0.773	17.536		
A3	0.749	0.744	16.770		
Social Influence					
SI1	1.000	0.706	_	0.418	0.782
SI2	0.796	0.664	11.757		
SI3	0.662	0.632	11.451		
SI4	0.719	0.622	11.122		
SI5	0.727	0.605	11.905		
Perceived Behavioral Control					
PBC1	1.000	0.672	_	0.502	0.801
PBC2	1.085	0.712	13.013		
PBC3	1.077	0.717	12.847		
PBC4	1.225	0.732	12.857		
Behavior Intention					
BI1	1.000	0.828	_	0.651	0.788
BI2	1.046	0.785	11.793		
Behavior					
B1	1.000	0.876	_	0.506	0.855
B2	0.477	0.443	10.142		
B3	0.597	0.793	21.271		
B4	0.640	0.795	21.331		
B6	0.436	0.680	16.682		
B7	0.907	0.589	14.263		

Composite Reliability (CR) and Average Variance Extracted (AVE) were used to test the reliability of constructs. Hair et al. (2005) recommends a minimum threshold of 0.7 for CR to be acceptable. As indicated in Table 8, CR scores for all the model constructs exceeded the minimum threshold, and indicated satisfactory convergent validity. AVE values above the 0.5 are deemed acceptable to indicate satisfactory convergent validity (Fornell and Larcker,

1981; Hair et al., 2005). AVE scores for latent model constructs - attitudes, perceived behavioral control, behavioral intentions, and behavior exceeded the minimum threshold, indicating satisfactory convergent validity (Table 8). Knowledge and social influence did not show sufficient convergent validity in terms of AVE. However, both these constructs were accepted under CR criteria. Hence, it was concluded that selected indicator variables converge sufficiently to measure their respective latent model constructs.

Table 9: Comparison between AVE and Squared Correlations between Each Model Construct for the Final Model

	Social Influence	**Knowledge**	**Perceived behavioral control**	**Attitudes**	**Behavioral intentions**
Social influence	**0.418**				
Knowledge	0.061	**0.487**			
Perceived behavioral control	0.004	0.071	**0.502**		
Attitudes	0.001	0.018	0.001	**0.644**	
Behavioral intentions	0.022	0.091	0.095	0.007	**0.651**
Behavior	0.017	0.211	0.126	0.005	0.161

AVE values are indicated on the diagonal

Assessing the Structure Model Fit

Some commonly reported model fit indices in SEM research are summarized in **Table 10**. The Chi-square goodness of fit test (χ^2) produced a value of 544.9 with 287 degrees of freedom (d.f.). In the χ^2 goodness of fit test, non-significance is desired. However, χ^2 statistic was significant at $p<0.001$ level. The χ^2 test is sensitive to sample size, and for larger samples, it usually gives significance, hence the χ^2 value divided by its degrees of freedom is considered a more appropriate test for larger samples (Hair et al., 2005). A χ^2/d.f. ratio of less than five is generally accepted. For the re-specified hypothetical model, the χ^2/d.f. ratio was 1.898 and this indicated a good model fit. Other goodness of fit indices, and alternative indices reported in Table 10 indicate good model fit under their respective decision criteria, except for the index RMR. These evidences suggest that sampling data and structure model

has a good fit. Comparison of tables 7 and 10 confirms that all fit indices for the re-specified model have substantially improved from the initial model.

Table 10: Fit Indices for the Final Structural Model

Index	Index value	Decision criteria	Decision
Chi-square test			
Chi-square	544.9	p>0.05	Reject
Chi-square /d.f.	1.898 (544.9/287)	<5	Accept
Goodness of fit indices			
GFI	0.924	>0.9	Accept
AGFI	0.907	>0.9	Accept
PGFI	0.755	>0.5	Accept
NIF	0.9	>0.9	Accept
Alternative indices			
CFI	0.948	>0.9	Accept
RMSEA	0.042	<0.05	Accept
RMR	0.072	<0.05	Reject

Path Analysis and Hypothesis Testing

Direct, indirect and total effects between constructs for the ecotourism behavior model examined. According to path analysis results, knowledge directly affects attitudes, perceived behavioral control, future behavioral intentions and behaviors. In addition, knowledge has indirect effects on future behavioral intentions and behaviors. The total effect of knowledge is strongest on behavior (0.456), followed by future behavioral intentions (0.281). Hence knowledge is an important antecedent of future behavioral intentions and behaviors. When the magnitude of total effects are considered, knowledge, perceived behavioral control, and future behavioral intentions seem to be the critical precursors of ecotourism behavior. Similarly knowledge, perceived behavioral control and satisfaction function as important antecedents of future behavioral intentions.

Table 11 summarizes the standardized path coefficients and hypothesis testing results for ecotourism behavior model. The 11 hypotheses are indicated as paths, depicting the direction of the positive effect. All paths reported t-statistics exceeding 2.0 for parameter

significance tests with the exception of path knowledge→ satisfaction. The magnitude of standardized coefficient reflects the strength of relationship (Figure 2). Knowledge had the strongest significant relationship with behavior (standardized coefficient = 0.348, *p<0.001*). Satisfaction also showed a strong positive relationship with future behavioral intentions (standardized coefficient = 0.321, *p<0.001*).

Table 11: Hypothesis Testing for the Ecotourism Behavior Model

Path/Hypothesis			Standardized coefficient	t-statistic	*p*
Attitudes	←	Knowledge	0.114	2.168	0.030
Perceived behavioral control	←	Knowledge	0.263	4.703	0.000
Satisfaction	←	Knowledge	0.044	0.665	0.506
Satisfaction	←	Attitudes	0.132	2.832	0.005
Satisfaction	←	Perceived behavioral control	0.103	2.124	0.034
Satisfaction	←	Social Influence	0.246	4.901	0.000
Behavior Intention	←	Knowledge	0.211	3.964	0.000
Behavior Intention	←	Satisfaction	0.321	6.939	0.000
Behavior Intention	←	Perceived behavioral control	0.213	3.795	0.000
Behavior	←	Knowledge	0.348	6.895	0.000
Behavior	←	Behavior Intention	0.238	4.513	0.000
Behavior	←	Perceived behavioral control	0.190	3.697	0.000

Discussion

In this study, we developed an ecotourism behavioral model of natural forest recreation areas, integrating satisfaction as an intermediary variable. The proposed model is a modification of Ajzen's theory of planned behavior and incorporates knowledge and satisfaction as added constructs. The utility of the TPB in describing leisure choices and behaviors has been well established (Ajzen and Driver, 1992; Lam and Hsu, 2004; March and Woodside, 2005). This model broadens the understanding on antecedents of human recreational behavior in the context of ecotourism, and especially contributes to consumer behavioral research in ecotourism from the theoretical perspective.

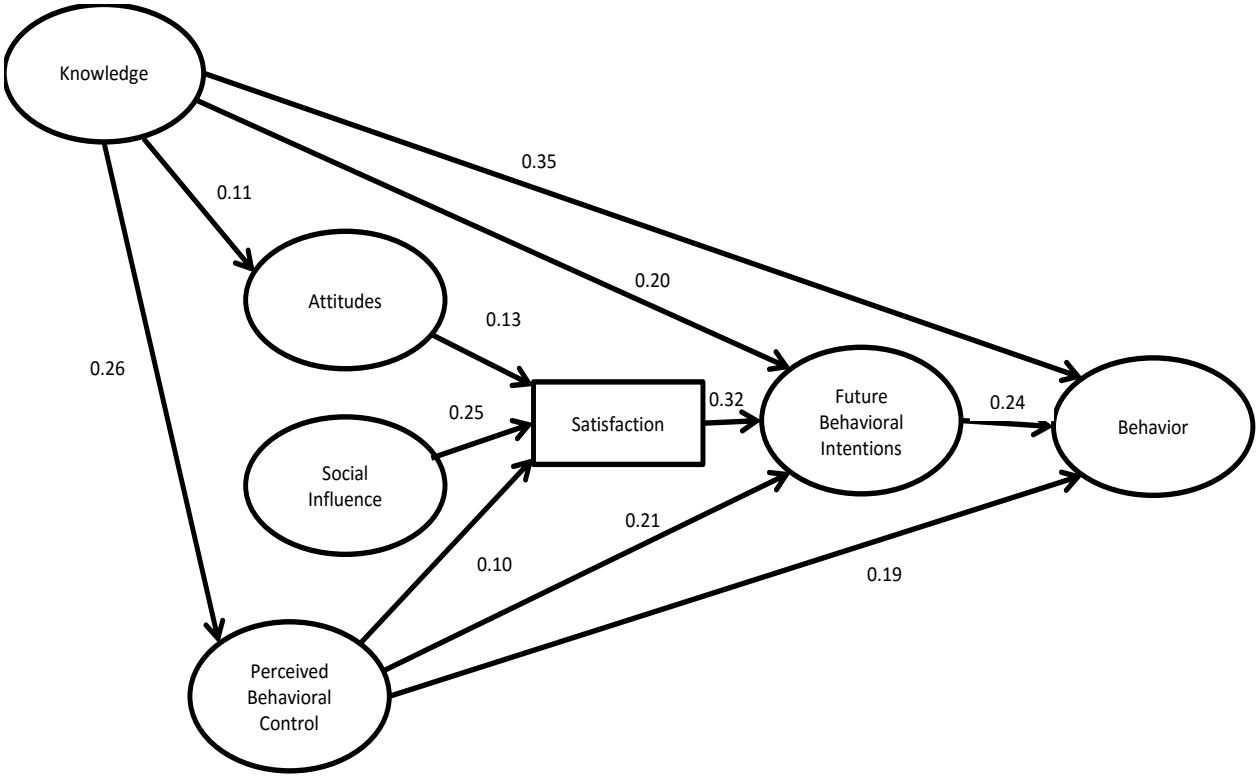

Figure 2: Path Diagram for Ecotourism Behavior Model with Causal Relationships

Satisfaction is at the focal construct/objective in most leisure behaviors. Mannell and Iso-Ahola (1987) argued that psychological outcomes from a leisure experience can be measured using satisfaction. Visitor satisfaction is also deemed as a key indicator of experience quality in tourism (Lee et al. 2007). By incorporating "satisfaction" as a mediating variable to the TPB, Lee (2007) developed an ecotourism behavioral model of national forest recreation areas in Taiwan. Using the improved model, Lee (2007) explained that attitude, subjective norms and perceived behavioral control affected satisfaction directly, and behavioral intention and behaviour indirectly. Satisfaction was found to be strongly influenced by subjective norms, perceived behavioral control and attitudes. Accordingly, Lee (2007) concluded that ecotourism behavior can be better explained by the added model construct of "satisfaction" to the TPB. Supporting results from past studies (Lee et al., 2007; Lee, 2007; Yuan et al., 2008; Perera and Vlosky, 2013), this present study further emphasizes

satisfaction as an important predictor of ecotourist intention to revisit and recommend destinations.

Ecotourism is a knowledge-based form of tourism; as such, this study explored the role of knowledge in shaping ecotourism behaviors and future ecotourism behavioral intentions. Results of the study suggest that predictive effect of knowledge and mediating effect of satisfaction introduced to the theory of planned behavior are indeed important modifications in predicting behavioral intentions and behaviors of ecotourism. This was evident from knowledge having significant positive direct effects on behavioral intentions and behavior, while satisfaction having the strongest direct effect on behavioral intentions. Ecotourism is often described as a knowledgeable form of travel with education, learning, and nature appreciation sited as primary motives (Weaver, 2007). Knowledge also plays a key role in attitude formation (Raju et al., 1995). Hence, it can be expected that knowledge to emerge as the most important predictor of future behavioral intentions and behavior in ecotourism.

Berger and Mitchel (1989) suggested that a person acquires knowledge about a particular behavior over time, and a connection exists between the level of knowledge a consumer has, and the decisions he/she makes. This notion is supported by knowledge having significant direct effects on behavioral intentions and behavior in the proposed model. In addition, knowledge having direct effect on perceived behavioral control explains the scenario that an individual assessing his/her internal and external resources/capabilities before participating in ecotourism. Having a better knowledge regarding the behavior in question i.e. what to expect in a typical ecotourism experience leads an individual to make accurate decisions since it facilitates the process of evaluating his/her internal and external capabilities against possible outcomes.

Sapp and Harrod (1989) used the social acceptability construct to further describe normative beliefs in TPB. It essentially examines the view an individual has towards social systems or institutions regarding the behavior under investigation. The model construct "social influence" in present model represents both referent groups and social systems. Leisure or tourism behaviors are often associated with groups of people. Hardcore ecotourists travel in small groups while causal ecotourists travel in larger groups. In services such as nature-based tourism, people are an essential component since they are a part of the overall service delivery process (Zeithmal et al., 2009; Perera et al., 2015). In services, other customers' attitudes, beliefs, and actions affect an individual's satisfaction derived from the service. The construct "social influences" in the present model suggests a strong effect on satisfaction in explaining this phenomenon.

Ecotourism activities require certain degree of skills and physical stamina. Therefore, a person with less skills and physical stamina may not be able to fully experience an ecotourism product. This in turn affects the overall satisfaction. Perceived behavioral control in TPB explains an individual's perceived ease or difficulty in performing a behavior. An individual assess his/her internal and external resources/capabilities before making a decision on whether to participate in ecotourism. This scenario is evident in present model with perceived behavioral control having significant positive effect on satisfaction behavioral intentions and behavior.

Study limitations

There were certain limitations in the study. First, the data were collected over a fairly short five-month period from September 2010 to January 2011 due to time constraints for the principal investigators and assistants. Hence, the sample frame in this study represented only a small number of visitors to forest-based recreational sites in Sri Lanka over time. Data

collected at least in a one year period would have been preferred in order to yield a more accurate cross-section of visitors to these sites.

The proposed model was developed to explain the ecotourist behavior. However, visitors who visited the study sites explain the behavior of individuals visiting forest-based attractions in Sri Lanka, rather than the behavior of the population of ecotourists. Numerous ecotourism scholars have contested the idea of defining ecotourists based on the type of sites visited or on-site activities they participate (Tao et al., 2004; Kerstetter et al., 2004; Perera et al., 2012). Future studies should be conducted to distinguish ecotourists based on motivational and behavioral grounds (Perera et al., 2012), and the model shall be applied to understand the ecotourist segment.

Furthermore, an expanded set of items to measure constructs such as attitudes, social influence, future behavioral intentions and behavior could be included in future research instruments. Finally, as is the case in most social science studies, the methodology used in this study permitted respondents to self-report their responses to items in the questionnaire while in the presence of the survey administrator. This may influence respondent bias toward providing responses that they believe the administrator wants to receive (Zeithmal et al., 2009; Perera et al., 2015).

Conclusion

In this study, we found a modified TPB model to be appropriate in examining ecotourist behaviors. A predictive effect of knowledge, and a mediating effect of satisfaction introduced to the TPB are important modifications in predicting behavioral intentions and behaviors of forest-based ecotourism. Knowledge was found to be the most important predictor of future behavioral intentions and behavior in ecotourism.

Study findings have several implications for protected area managers and ecotourism operators. Knowledge as a precursor of intended behavior largely determines actual behavior

as well as future behavioral intentions. As such, protected area managers and ecotourism operators should consider visitor education – the provision of knowledge - as a key component of ecotourism products and experiences. Knowledge acquired through the actual ecotourism experiences is a driver for re-visitation, word-of-mouth promotion, and visitor satisfaction. This calls for substantive on-site interpretation services and opportunities. Visitor awareness at forest-based ecotourism destinations can also help on changing public attitudes towards environmental conservation. Environmentally conscious visitors are less likely to cause disturbances to the environment during their visits to ecotourism–oriented natural areas.

Visitor satisfaction is a primary consideration in leisure management. The ecotourism behavior model developed in this study found satisfaction to have the strongest direct influence on behavioral intentions. However, this is not easy to operationalize in ecotourism management as satisfaction can be affected by many factors that are beyond the control of ecotourism operators i.e. weather, seasonality, animal migrations/movements, carrying capacity, and socio-political climate etc. Hence, in the context of forest-based ecotourism planning and management, more emphasis should be placed on manipulating the factors that are controllable to ecotourism operators, and enhancing the quality of the ecotourism product to give better value for the cost incurred. Enhancing trip quality may require building infrastructure to facilitate wildlife observation, improving on-site education, interpretation, information, and introduction of new ecotourism activities.

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