


# Key Factors Influencing Environmentally Responsible Behavior in the Community-Based Ecotourism Development (CBET): Antecedents and Implications

Sambath Phou<sup>1</sup>, Chanveasna Uk<sup>1</sup>, Tithdanin Chav<sup>1\*</sup>, Veasna Sou<sup>2\*</sup> 

<sup>1</sup>International Business Management (IBM) Department, Royal University of Phnom Penh, Phnom Penh City, Cambodia

<sup>2</sup>Research Office, Royal University of Phnom Penh, Phnom Penh City, Cambodia

Email: \*tithdanin.chav@gmail.com, \*sou.veasna@rupp.edu.kh, phou.sambath@rupp.edu.kh

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## Abstract

Community-based ecotourism (CBET) aims to empower local communities through engagement and participation. Cambodia serves as a prime example of a developing country where the local community necessitates sustained stakeholder support to foster empowerment and promote local economic development. Ecotourism and conservation are among the major issues of concern in the study of community development. This study used the main five eco-tourism areas in Cambodia as examples. It looks at the connections between eco-innovations in tourism products, community engagement, co-creation experiences, support for CBET, perceived impact likelihood outcomes, community economic benefits, environmentally responsible behavior in ecotourism sites, and biodiversity conservation. The study employed a quantitative research approach to investigate and parameterize the dynamic ecotourism components as well as to explore key factors that influence the CBET. We collected the data using a self-administered survey on 398 local eco-based tourism communities that sell services and products to tourists. We also asked for structured questionnaire items of local communities that provide tourism services to visitors in eco-tourism destination sites in 2022-2023. The SEM results showed that this study significantly impacted and confirmed all relationships among research variables, as proposed in the conceptual model. We also discuss in detail the research findings of this study.

## Keywords

Tourism Product Eco-Innovations, Community Engagement, Co-Creation

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## 1. Introduction

Government policy objectives for ecotourism development include poverty reduction, rural community development, environmental education, and biodiversity conservation [1]. Scholars have given both community-based ecotourism and cultural tourism destinations in Cambodia limited attention [2]. Tourism destinations in Cambodia are the second largest income source after garment industries [3]. The tourism destinations attract more than 5 million international tourists every year to visit [4], especially in world heritage sites; this may also create local jobs, increase livelihood, and reduce migration to seeking jobs in other countries, while revenue from international tourism in 2020 was decreased by 96.5% [5]. Tourism scholars agree that social entrepreneurship has an important role in adopting financially sustainable strategies to achieve social aims and the responsible development of eco-tourism [6]. Ecotourism can be “defined as a form of tourism based on nature-based activities, focused on the tourist learning about the ecosystem” [7]. Community-based ecotourism (CBET) has become a popular strategy to alleviate the contradiction between ecological protection and community development as the stakeholders of CBET, the community’s participation in the planning process is of great importance to realize the sustainability of CBET [8]. However, promoting environmentally responsible behaviors among the local tourism community, tourists, and policymakers is crucial for achieving sustainability objectives in the hospitality and tourism sectors [9].

Understanding tourists’ environmentally responsible behavioral intention is crucial for sustainable development in outdoor leisure tourism, as environmental issues are increasingly emphasized [10]. Ecotourism development is crucial for the ecology and environment of tourist destinations [11], but increasing tourist misbehavior is damaging the environment. Despite managers’ efforts to regulate behavior, external constraints have limited effectiveness in promoting pro-environmental behavior [12]. Encouraging internal motivation is crucial for tourists to adopt and sustain such behavior [13]. Understanding how to promote pro-environmental behaviors by evoking emotions is a real-world problem that destination managers are eager to solve [14]-[16]. Indeed, tourists pose a significant threat to eco-destinations due to their irresponsible behavior [17], leading to negative environmental impacts like trash, pollution, and forest fires [18]. A study applies the experiential learning cycle theory to examine how tourists’ plans for environmentally friendly tourism enhance environmental management and simplify sustainable development in Taiwan region’s smart tourism destinations [19]. To mitigate these issues, visitors must change their behavior, considering both internal and external factors such as environmental opinions and digital campaigns

by destination management organizations [20]. This study is crucial for tourism destination managers as it offers strategies to encourage environmentally friendly tourism behaviors among tourists [21].

Critics of the tourism and hospitality industry have pointed out its environmental impact [22], prompting them to prioritize pillar “E” in their environmental, social, and corporate governance (ESG) practices [23]. Organizations like Hilton have implemented sustainability strategies, such as reducing single-use plastics and using digital keys [24]. Consumers are growing increasingly sensitive to ecological concerns, and employee-customer perceptions of an organization’s ESG primarily occur at the individual level [25]. Meanwhile, scholars have also emphasized the major impact of employee pro-environmental behaviors on corporate environmental responsibilities from the micro-level [26]. Indeed, service innovation from employees helps hospitality organizations gain a competitive advantage and sustain business growth [27]. Ecotourism destinations are implementing services or products and innovative strategies that promote environmental protection, community involvement, and sustainable tourism practices [10]. Similarly, tourism and hospitality practitioners have demonstrated a high level of innovation and initiative in the environmental responsibilities of ESG practices [28].

Researchers have studied pro-environmental behaviors from various stakeholders [29], including visitors [30], residents [31], and communities [32], to ensure sustainable management and promote environmental sustainability [33]. The sustainable development of tourism is crucial for protecting natural environments, especially in ecotourism-based destinations [34]. Encouraging tourists to engage in pro-environmental behavior can be challenging due to social dilemmas. This study adds to the norm-activation theory by looking at key factors like community involvement, eco-innovation in tourism products, co-creation experiences, support for community-based ecotourism (CBET), perceived effects on livelihood outcomes, and community economic benefits. It does this by building on previous research arguments and filling in gaps in the theory. By proposing an integrated model, the study aims to improve understanding and prediction of local communities’ environmentally responsible behaviors at ecotourism sites. This framework not only deepens insights into the connections among these variables but also fosters more effective strategies for promoting sustainable practices within community-based ecotourism initiatives.

## **2. Literature Review and Hypotheses Development**

### **2.1. Theoretical Background**

Researchers have used various theoretical frameworks, such as the theory of reasoned action [35], norm-activation theory [36] [37], and value-belief-norm theory [38], to explain tourists’ pro-environmental behavior (PEB) decisions. These theories, particularly the norm-activation theory and value-belief-norm theory, consider altruistic elements in PEB. There are three main belief variables in norm-

activation theory (NAT) that help us understand PEB decisions [39]: personal norm, ascription of responsibility, and awareness of consequence [40]. Recently, researchers in Hangzhou, China, have applied the norm-activation theory to investigate tourist intentions in natural parks [34]. However, our study employs this theory to scrutinize the behavior of local tourism communities concerning environmental responsibility, with the aim of enhancing their business sustainability, boosting income, creating more jobs, and fostering local economic growth.

## 2.2. The Effect of Tourism Product Eco-Innovations

Tourism product eco-innovations are new products, processes, services, or management methods developed to reduce environmental risk, pollution, and negative impacts on resource use. They can be a set of techniques or management guidance, focusing on technologies, equipment, operational procedures, and environmental management. These innovations meet the principles of sustainable development [41]. Tourism research scholars have paid less attention to investigating the relationship between tourism product eco-innovations and community economic benefits. Then, this study applies marketing brand management literature to the tourism destination context, for instance, product eco-innovations improve economic benefits, which leads to local communities in exchange for their economic benefits [42]. By drawing the concept of product eco-innovations, tourism product eco-innovations may directly influence the economic benefits [43]. Tourism product eco-innovations not only extends the service hours of the tourism destination sites but also expands the community's economic benefits [44]. Thus, this study borrows the product innovation concepts contributes to improving the community economic benefits in eco-tourism destination sites which lead to tourists in exchange for their local economic benefits in the CBET. Similarly, product eco-innovations for tourism sectors really contributes to increase economic well-being in Spain [45]. Indeed, product eco-innovations enhance economics growth in ASEAN countries [46]. Tourism firms rely on process innovation to implement eco-innovation products might lead to improve the local people living standards and create more jobs for them [47]. Eco-innovations in tourism products are becoming increasingly important for sustainable development within communities. These practices enhance environmental sustainability while enriching the tourism experience. As tourists become more environmentally conscious, demand for eco-friendly tourism products increases. By adopting eco-friendly practices, tourism businesses can attract eco-aware travelers, boosting their competitiveness and revenue. Eco-innovations also improve resource quality and efficiency, lowering operational costs for providers and promoting entrepreneurship. Community involvement in eco-innovative tourism projects fosters ownership and pride among residents, enhancing their skills and employability. Additionally, eco-tourism encourages preservation of cultural and natural heritage, enhancing tourism appeal and profitability. This positive impact on economic benefits creates a cycle of sustainability, economic growth, and community well-being. Empirical research could

provide valuable insights into fostering more sustainable tourism practices. The following hypothesis is proposed:

*Hypothesis 1: Tourism product eco-innovations positively impact the community's economic benefits.*

### **2.3. The Effect of Community Engagement**

Most approaches to community engagement in tourism development aim at providing benefits of some sort to local communities. “Yet, some approaches define community engagement mainly in terms of economic profit accruing to local people.” [6] The reciprocity framework for community engagement maintains that a sustainable extractive project requires its promoter to nurture constructive and mutually beneficial relationships with local communities [48]. This study suggested that local government officials are unaware of the benefits of community participation [49]. The local community sees a squandered opportunity to capitalize on economic benefits [50], particularly in tourism. Therefore, community engagement improves socioeconomic conditions [51]. Community engagement is the active participation of local residents in decision-making, planning, and development processes that affect their community. It positively impacts the community's economic benefits by fostering a sense of ownership, identifying untapped resources and opportunities, enhancing social capital, and attracting external investment. By involving residents in planning processes, they advocate for necessary enhancements in public services and infrastructure, which attract new businesses and residents, further boosting the local economy. This multifaceted impact underscores the importance of involving residents in the economic development process. Engaged communities are more likely to attract external investment, as they display stability and potential growth. Overall, community engagement significantly enhances a community's economic benefits by fostering ownership, leveraging local knowledge, building social capital, attracting investment, and improving infrastructure. According to the above research arguments, this study proposed the following research hypothesis:

*Hypothesis 2: Community engagement positively impacts the community's economic benefits.*

### **2.4. The Effect of Co-Creation Experience**

The co-creation experience refers to the mental state created by customers during the value co-creation process [52]. This experience value is the result of co-creation activities and customer integrations. Both organizations and customers can co-create a service experience to meet customer demands in specific situations [53]. The co-creation experience is the basis of value, and its realization depends on understanding the form of the customer experience [54]. Co-creation experience in tourism involves involving stakeholders like tourists, local communities, and businesses in the creation and delivery of services and experiences. This approach positively impacts the economic benefits of local communities by allowing

them to actively participate in shaping their tourism offerings, resulting in unique and authentic experiences [55]. This fosters relationships among stakeholders, leading to stronger community ties and networks. Co-creation experience also fosters local capabilities and skills, empowering residents to innovate and adapt their offerings to meet changing tourist demands [56]. This fosters job opportunities and stimulates economic growth, benefiting the entire community [57]. Prioritizing local residents' contributions can lead to sustainable tourism practices that consider the social, cultural, and environmental contexts of the destination [58]. Co-creation experience is also a means to ensure local people's dominance and involvement in the practice and support of traditional tourism activities, and this can be further enhanced by investing in activities that improve lifestyles and the worth of living to enhance cultural values through tourism projects [59]. Co-creation experience are more clearly related to economic benefits and will likely ensure a series of events in tourism activities [60]. Therefore, this study assumes that co-creation experience of society's life activity which innovates impulse arises from a person's desire to gain economic benefits. The following research hypothesis is proposed:

*Hypothesis 3: Co-creation experience positively impacts the community's economic benefits.*

## **2.5. The Effect of Support for CBET**

Support of community-based ecotourism (CBET) has become a popular tool for biodiversity conservation. It is based on the principle that biodiversity must pay for itself by generating economic benefits, particularly for local people [61]. Support for CBET contributes to community welfare and generated economic benefits [62]. Most residents of a CBET are likely to support Environmental responsible behavior and believe that it positively impacts their livelihood assets and outcomes with economic benefits in tourism-hungry communities [63]. Support CBET for conserving natural and cultural resources to promote equitably raising local communities' living standards and quality of life through community economic benefits in an eco-tourism destination context. Support for CBET sites to carry out economic activities and economic benefits for the local tourism community [64]. Community-Based Eco-Tourism (CBET) is a sustainable tourism model that combines environmental conservation with community development. Support for CBET initiatives can lead to economic benefits for local communities. By integrating natural resource conservation with community development, eco-conscious travelers can find authentic experiences. Communities often create tourism products reflecting their unique cultures, traditions, and natural environments, enhancing the destination's appeal and increasing economic inflow. Support for CBET fosters a sense of ownership among community members, encouraging active participation in tourism-related initiatives. This engagement can lead to skill development, capacity building, and the establishment of local enterprises, contributing to job creation and income diversification. Financial gains from CBET

initiatives can also support local infrastructure development, enhancing the overall tourist experience. Thus, this current research explores the mechanisms through which CBET enhances economic outcomes and their long-term impacts on community prosperity. Then, the following research hypothesis is proposed:

*Hypothesis 4: Support for CBET positively impacts the community's economic benefits.*

## 2.6. Perceived Impacts on Livelihood Outcomes

A recent study assessed impacts on livelihoods by applying the Sustainable Livelihoods Framework to explore perceived conservancy-related economic benefits and costs (*i.e.*, perceived changes in social, financial, human, physical, and natural capitals) [65]. Another analysis revealed that eco-tourism destination site issues were the most influential perceptions of local tourism communities on their perceived impact on livelihoods, community development, and economic benefits [66]. The study findings on the perceived impact of livelihood on tourism and recreation were reported to be limited, despite these being the most critical economic benefits in many sectors in local tourism communities [67]. Indeed, this study indicated that a key challenge in sustainable tourism is to develop economically viable local tourism communities that greatly impact livelihood benefits to improve local communities while protecting indigenous cultures and tourism destination environments. The study of sustainable development and tourism suggests that when community members perceive positive impacts on their livelihoods, it leads to enhanced economic benefits for the community. This is because livelihood outcomes, such as income generation, employment opportunities, skills development, and quality of life, are positively impacted by tourism or development initiatives. This increased engagement can lead to a more vibrant local economy, increased investment in local businesses, and a stronger sense of community and social cohesion. This social capital can motivate collective action towards sustainable practices and further economic improvements, creating a cyclical effect that amplifies the positive outcomes. Therefore, this current research explores the specific connections between perceived livelihood improvements and economic metrics to provide empirical evidence and insights into enhancing community engagement in sustainable initiatives. Then, the following research hypothesis is proposed:

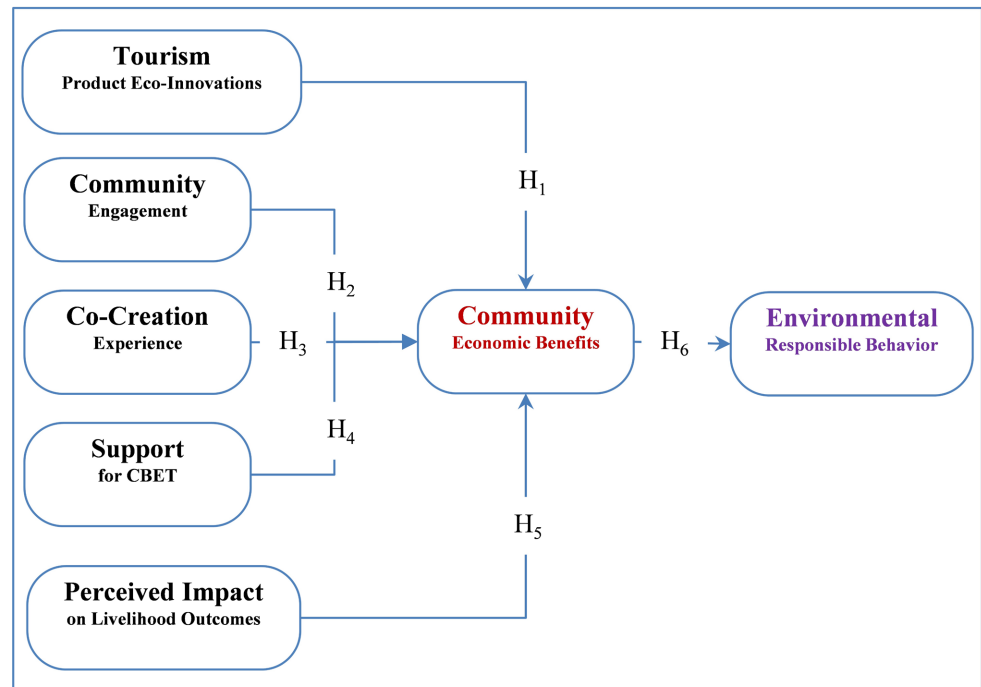
*Hypothesis 5: Perceived impacts on livelihood outcomes positively impact the community's economic benefits.*

## 2.7. The Effect of Community Economic Benefits

A communities benefit economically has correlated with environmental responsible behavior [61]. In CBET literature, the natural environment must pay for itself by generating economic benefits for the local community, and the community economic benefit derived from the eco-tourism environment through Environmental responsible behavior should foster pro-environmental attitudes and behaviors [62]. The CBET framework is fast becoming a popular biodiversity

conservation tool that develops and benefits the local community, which leads to improved Environmental responsible behavior in the eco-tourism destination context [68]. All members of a local community involved in CBET must benefit from the project development [69]. Community economic benefits involve the conservation of resources and social and economic development related to Environmental responsible behavior and must lead to the quality of the visitor experience [7]. In literature of CBET is a new economic growth point for the eco-tourism community, which hopes to bring economic benefits to the community from environmental responsible behavior [8]. The hypothesis suggests that community economic benefits can lead to environmentally responsible behavior among residents. Economic growth and improved living standards through sustainable practices can encourage residents to engage in environmentally friendly actions. Stable incomes can encourage sustainable products, energy-efficient technologies, and conservation initiatives. This financial security can also lead to a sense of community pride and ownership, as residents perceive their prosperity as derived from preserving natural resources. A thriving local economy can foster community cohesion and collective action towards environmental initiatives. Additionally, increased economic power can lead to stronger voices in local governance, ensuring decisions support both economic growth and environmental integrity. This suggests that enhanced community economic benefits can lead to greater environmentally responsible behavior among residents. From the above research arguments, this study is proposed the following hypothesis:

*Hypothesis 6: Community economic benefits positively impact the environmental responsible behavior.*



**Figure 1.** Conceptual model for environmental responsible behavior.

## 2.8. Conceptual Framework

The conceptual framework for environmentally responsible behavior (**Figure 1**) in Cambodia's eco-tourism context is crucial for promoting sustainable practices that align with the country's unique environmental and cultural landscape. It provides a structured understanding of the influences on environmentally responsible behavior among tourists, local communities, and stakeholders in the eco-tourism sector, identifying factors such as cultural values, local community engagement, economic incentives, and educational initiatives. The framework emphasizes the role of local communities in eco-tourism development, emphasizing their participation and ownership as essential drivers of sustainable practices. It also serves as a tool for policymakers and practitioners to design effective interventions and policies that promote environmentally responsible behavior. It also facilitates awareness-raising and education efforts aimed at both tourists and local residents, fostering a culture of sustainability that encourages responsible behavior (**Figure 2**).

## 3. Methods

### 3.1. Sampling Procedures

A self-administered was adopted to deliver a hard copy of the questionnaire to respondents with a purposive sampling technique [70] which is adopted to collect data from local community residents who running their family business for main popular eco-tourism sites in Cambodia, such as: Thmatboey, Prek Thnout, Osvay, Ang Trapeang Thmor, Preah Rumkel, and Prek Toal. By determining the sample sizes of this study, a formula by Cochran [71] is used to calculate the sample size for the unknown population, with the alpha level, a priority, at 0.05. This study plans to use a proportional variable to set the acceptable error level at 5% and estimated the standard deviation of the scale to be 0.5. As an example of its use, Cochran's sample size formula is presented here in addition to an explanation of how these decisions were made.

$$n = \frac{Z^2 (p * q)}{e^2} = \frac{1.96^2 (0.5 * 0.5)}{0.05^2} = 384$$

where  $Z$  represents the value for a selected alpha level of 0.025 in each tail,  $Z = 1.96$  (the alpha level of 0.05 indicates the level of risk the researcher was willing to take; the true margin of error may exceed the acceptable margin of error), and  $(p * q)$  represents the estimate of variance,  $(p * q) = 0.25$ . According to this suggestion, this study collects sample sizes at least 406 participants for a formal data analysis. Therefore, this study's total final sample size was collected 406 respondents for formal data analysis.

### 3.2. Measurement Scales

Data for this study were collected from a questionnaire survey which the design was based on the stages outlined by Churchill and Iacobucci [72]. Respondents

were then asked to rate how well they considered their service performance in eco-tourism destination site in Cambodia, using a 5-point Likert scale ranging from 1= strongly disagree; 2 = disagree; 3 = neutral; 4= = agree; to 5 = strongly agree. Considering the measures of “co-creation experience”, which contains two-sub-dimension with six items were selected from Xie, Guan, Liu and Huan [54]. Tourism product eco-innovations consist of six items adopted from Tumelero, Sbragia and Evans [41]. Environmental responsible behavior consists of six items adopted from Cheng and Wu [73] and Su, *et al.* [74]. Community engagement consists of three items adopted from Liu, *et al.* [75]. Community economic benefits consist of eight items adopted from Liu, Qu, Huang, Chen, Yue, Zhao and Liang [75] and Kummitha, *et al.* [76]. Support for CBET consists of five items adopted from Ven [63]. Perceived impacts on livelihood outcomes consist of six items adopted from Ven [63]. The questionnaire items are listed in **Appendix 1**-Questionnaire design.

## 4. Results

### 4.1. Factor Analysis and Reliability Test

Exploratory factor analysis with the principal component method with VARIMAX rotation was employed to test the factor analysis and reliability tests to verify the research variables’ dimensionality and reliability as proposed conceptualized research framework in **Figure 1**. Several purification processes, including factor analysis, correlation analysis, and internal consistency analysis (Cronbach’s Alpha:  $\alpha$ ), are tested by this study. Factor analysis is first to identify the dimensionality of each research item. Theoretically, this section indicates that the threshold of the factor loading score of each item must be higher than 0.60. Item-to-total correlation and coefficient Alpha ( $\alpha$ ) are accessed to examine the internal consistency and reliability of the primary research construct. According to Hair Jr, *et al.* [77], factor loading of each research item must be greater than 0.60, Eigenvalue is greater than 1, Cumulative percentage must be higher than 0.60, Kaiser-Meyer-Olkin (KMO) is higher than 0.50, Item-total-correlation is greater than 0.50, and coefficient Alpha ( $\alpha$ ) must be higher than 0.60 or 0.70, respectively. Most importantly, the rest of the research items have met the rule of thumb of the formal reliability test and were adopted to double-confirm with Confirmatory Factor Analysis (CFA) and test the research hypotheses with Structural Equation Modeling (SEM) by performing AMOS 29 software (**Table 1** and **Table 2**).

**Table 1.** Result of factor analysis & reliability test.

Variables	FL	KMO	Eig.	CUM%	ITC	Alpha
<b>Co-Creation Experience</b>						
<i>Hedonic Experience [HHE]</i>						
HEE3	0.854	<b>0.695</b>	<b>2.081</b>	<b>69.352</b>	0.650	<b>0.779</b>
HEE1	0.838				0.624	
HEE2	0.805				0.575	

**Continued***Social Experience [SOE]*

SOE1	0.885	<b>0.710</b>	<b>2.218</b>	<b>73.920</b>	0.723	<b>0.823</b>
SOE3	0.853				0.669	
SOE2	0.840				0.648	

**Tourism Product Eco-Innovations [TPEI]**

TPEI2	0.887	<b>0.919</b>	<b>4.467</b>	<b>74.447</b>	0.830	<b>0.931</b>
TPEI6	0.878				0.818	
TPEI3	0.871				0.810	
TPEI5	0.867				0.804	
TPEI1	0.865				0.801	
TPEI4	0.808				0.728	

**Community Engagement [COE]**

COE2	0.936	<b>0.748</b>	<b>2.554</b>	<b>85.137</b>	0.852	<b>0.913</b>
COE3	0.930				0.839	
COE1	0.902				0.786	

**Community Economic Benefits [CEB]**

CEB6	0.883	<b>0.906</b>	<b>4.340</b>	<b>72.326</b>	0.821	<b>0.923</b>
CEB5	0.873				0.807	
CEB2	0.849				0.774	
CEB3	0.835				0.761	
CEB1	0.832				0.756	
CEB4	0.830				0.754	

**Perceived impacts on livelihood outcomes [PILO]**

PILO6	0.868	<b>0.899</b>	<b>4.001</b>	<b>66.679</b>	0.793	<b>0.900</b>
PILO5	0.839				0.756	
PILO3	0.818				0.728	
PILO4	0.814				0.723	
PILO1	0.790				0.695	
PILO2	0.766				0.667	

**Support for CBET [SCBET]**

SCBET2	0.879	<b>0.844</b>	<b>3.519</b>	<b>70.374</b>	0.800	<b>0.894</b>
SCBET3	0.857				0.766	
SCBET4	0.842				0.743	
SCBET5	0.821				0.715	
SCBET1	0.792				0.679	

**Environmental Responsible Behavior [ERB]**

ERB4	0.905	<b>0.920</b>	<b>4.440</b>	<b>73.996</b>	0.853	<b>0.930</b>
ERB5	0.865				0.801	

**Continued**

ERB1	0.858	0.789
ERB3	0.858	0.789
ERB6	0.845	0.775
ERB2	0.828	0.753

Note: FL = Factor Loading Score must be >0.60; KMO = Kaiser-Meyer-Olkin must be >0.50; Eig. = Eigenvalue must be >1.0; CUM% = Cumulative percentage must be >60%; ITC = Item-total Correlation must be >0.50; Alpha = Cronbach Alpha coefficient must be >0.6.

**4.2. Correlation Matrix (n = 398)****Table 2.** Result of correlation matrix.

N	Variables	Mean	St.D	1	2	3	4	5	6	7	8
1	HEE	3.840	0.799	1.00							
2	SOE	3.579	0.939	0.634**	1.00						
3	TPEI	3.523	1.041	0.364**	0.648**	1.00					
4	COE	3.437	1.327	0.153**	0.516**	0.679**	1.00				
5	CBE	3.435	0.954	0.368**	0.669**	0.777**	0.664**	1.00			
6	PILO	3.461	0.920	0.335**	0.608**	0.730**	0.614**	0.810**	1.00		
7	SCBET	3.260	0.975	0.417**	0.650**	0.675**	0.614**	0.667**	0.602**	1.00	
8	ERB	3.539	1.050	0.356**	0.630**	0.830**	0.664**	0.741**	0.704**	0.645**	1.00

\*\*Correlation is significant at the 0.01 level (2-tailed). All abbreviation of research variables is listed in **Table 1**.

**4.3. Confirmatory Factor Analysis (CFA)**

The construct validity is assessed using the guidelines of Anderson and Gerbing [78]. First, the exploratory factor analysis for all the items resulted in factor solutions, as expected theoretically. The Cronbach Alpha coefficients for each factor were greater than 0.60. Second, we used confirmatory factor analyses (CFA) to assess the convergent validity of the measures. Confirmatory factor analysis consists of main two-part for this manuscript, firstly related to the “First Order-Factor Model” and secondly related to the “Second Order-Factor Model” [79]. This study adopted the first-order factor model (*i.e.*, this study does not report the Figures of first-order factor model) to examine the research construct individually, as shown in the results in **Table 4** and second-ordered as shown in **Figure B1**, respectively. If needed, some indicators were eliminated due to low factor loading or a possibility of high correlation with other indicator variables [77] [80]. The results of the second-order satisfied the threshold as suggested by Hair *et al.* (2014) and Koufteros *et al.* (2009). The threshold values of CFA and SEM as shown in **Table 3** were adopted to evaluate the results of CFA and SEM. All loadings exceed 0.60, and each indicator t-value exceeds 1.96 ( $p < 0.05$ ), thus satisfying the CFA criteria. As shown in **Table 4** and **Figure B1**, the overall goodness-of-fit assessment showed that  $\chi^2/df = 1.707$ , GFI = 0.902, AGFI = 0.862, NFI = 0.938, CFI = 0.973,

RMSEA = 0.042. The results indicated that the research model could be presented as a good model fit with acceptable convergent validity. Since all values were greater than the established cutoff criteria, this study proceeds with hypothesis testing using structural equation modeling (SEM). Indeed, the threshold of CFA and SEM (*i.e.*, **Table 3**) was adopted to evaluate the results of this study, as shown in **Table 4** and **Table 5**.

**Table 3.** The threshold of CFA and SEM.

Model Fit Statistics	Rule of Thumbs			
	Best Fit	Good Fit	Adequate Fit	Poor Fit
$\chi^2/D.F$	<2.50	<2.50	<2.50	<2.50
GFI	$\geq 0.91$	0.85 - 0.90	0.80 - 0.84	$\leq 0.79$
AGFI	$\geq 0.91$	0.85 - 0.90	0.80 - 0.84	$\leq 0.79$
NFI	$\geq 0.95$	0.90 - 0.94	0.80 - 0.89	$\leq 0.89$
CFI	$\geq 0.95$	0.90 - 0.94	0.80 - 0.89	$\leq 0.89$
RMSEA	<0.05	<0.05	<0.05	<0.05

**Sources:** Anderson and Gerbing [78], Jöreskog, *et al.* [81], Hair, *et al.* [82], Jöreskog and Sörbom [83]; Kline [84], and Hooper, *et al.* [85]. **Note:** Chi-square =  $\chi^2$ ; d.f = Degree of Freedom; GFI = Goodness of Fit; AGFI = Adjusted Goodness of Fit; NFI = Normed Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

The Average Variance Extracted (AVE) and Composite Reliability coefficients (CR) were applied to relate the quality of a measure. To avoid misconceptions, it is needed to appropriately understand the equations of the AVE and CR, as well as their association to the definition of validity and reliability. In this manuscript, we explain, using simulated one-factor models, how the number of items and the homogeneity of factor loadings might influence the AVE and CR results. Then, we apply Equations (1) and (2) to calculate the results of AVE and CR, as shown in **Table 4** below.

$$AVE = \frac{\sum_{i=1}^n \lambda_i^2}{n} = \frac{4.012}{6} = 0.669 \quad (1)$$

$$CR = \frac{\left(\sum_{i=1}^n \lambda_i\right)^2}{\left(\sum_{i=1}^n \lambda_i\right)^2 + \left(\sum_{i=1}^n \delta_i\right)} = \frac{24.01}{24.01 + 1.988} = \frac{24.01}{25.998} = 0.924 \quad (2)$$

*Example. Environmental Responsible Behavior (ERB)*

	$\lambda_i$	$\lambda_i^2$	$\delta_i(1 - \lambda_i^2)$
Environmental Responsible Behavior (ERB <sub>1-6</sub> )	0.749	0.561	0.439
	0.795	0.632	0.368
	0.811	0.658	0.342
	0.888	0.789	0.211

## Continued

	0.84	0.706	0.294
	0.817	0.667	0.333
$\Sigma$	<b>4.90</b>	<b>4.012</b>	<b>1.988</b>
$(\sum \lambda_i)^2$	<b>24.01</b>		
AVE	<b>0.669</b>		
CR	<b>0.924</b>		

Where:  $\lambda$  (Lamda) represents the standardized factor loading and  $i$  is the number of items from 1 to n and  $\delta$  (Delta) represents error variance terms while  $\delta = 1 - \lambda_i^2$ .

According to Fornell and Larcker [86] and Peterson and Kim [87] AVE must exceed 0.50, and CR must exceed 0.6 or 0.70, respectively. Hair *et al.* (2014) recommend that the t-value is greater than 1.96 and the  $p$ -value  $< 0.05$ . All other criteria shown in **Table 3** also need to evaluate the results of CFA and SEM. All results of CFA (**Figure B1**) and CR met the threshold, which indicated that these research variables have high reliability and validity. Thus, this study contributes to exploring the significant coefficient among hypothesis relationships.

**Table 4.** The result of overall model CFA.

Indicators	Research Constructs	$\lambda$	t-value	AVE	CR
ERB1	←	0.749***	17.696	<b>0.669</b>	<b>0.924</b>
ERB2	←	0.795***	18.487		
ERB3	← Environmental	0.811***	A		
ERB4	← Responsible Behavior	0.888***	21.833		
ERB5	← (ERB)	0.840***	20.043		
ERB6	←	0.817***	19.405		
CEB5	←	0.806***	18.31	<b>0.654</b>	<b>0.919</b>
CEB6	←	0.832***	19.085		
CEB4	← Community	0.775***	17.674		
CEB2	← Economic Benefits	0.818***	18.63		
CEB1	← (CEB)	0.816***	18.757		
CEB3	←	0.803***	A		
PILO6	←	0.767***	14.381	<b>0.590</b>	<b>0.896</b>
PILO5	←	0.816***	15.112		
PILO4	← Perceived impacts on	0.808***	14.818		
PILO3	← livelihood outcomes	0.795***	14.732		
PILO2	← (PILO)	0.687***	A		
PILO1	←	0.727***	13.644		

## Continued

TPEI6	←		0.844***	A	<b>0.694</b>	<b>0.931</b>
TPEI5	←		0.863***	22.515		
TPEI4	←	Tourism Product	0.764***	18.593		
TPEI3	←	Eco-Innovations	0.821***	23.38		
TPEI2	←	(TPEI)	0.860***	22.677		
TPEI1	←		0.841***	21.6		
COE3	←		0.897***	26.568	<b>0.772</b>	<b>0.910</b>
COE2	←	Community	0.906***	A		
COE1	←	Engagement (COE)	0.831***	22.954		
SCBET5	←		0.774***	17.467	<b>0.644</b>	<b>0.879</b>
SCBET4	←	Support for CBET	0.831***	A		
SCBET3	←	(SCBET)	0.783***	17.76		
SCBET2	←		0.821***	19.075		
HEE1	←		0.601***	A	<b>0.519</b>	<b>0.841</b>
HEE3	←		0.602***	12.633		
SOE1	←	Co-Creation	0.883***	12.938		
SOE2	←	Experience (CCE)	0.730***	11.594		
SOE3	←		0.746***	11.801		

**Note:** A = parameters of regression weight fixed at 1.000, and  $p$ -value significance level of <0.05 and a  $t$ -value of >1.96. \*\*\* $p$  < 0.001.  $\lambda$  = Standardized Estimates.

#### 4.4. Structural Equation Modeling (SEM)

The SEM model was applied to test a hypothesis with the likelihood estimation method using the same variables after CFA, as in **Table 4**. Moreover, the second-order factor model or overall model (**Figure B1**) was adopted to test the overall variables [78]. The results show goodness-of-fit measurements were satisfactorily acceptable ( $\chi^2/df = 1.707$ , GFI = 0.902, AGFI = 0.862, NFI = 0.938, CFI = 0.973, RMSEA = 0.042) and indicate that the proposed model was satisfactory with goodness-of-fit assessment (Hair *et al.*, 2010). The CFA, which used the same variables as shown in **Table 4**, was run before proceeding with the SEM to test the likelihood estimation method. **Table 5** and **Figure 2** show that goodness-of-fit measurements were acceptable (GFI = 0.890, AGFI = 0.846, NFI = 0.928, CFI = 0.964, RMSEA = 0.048). This indicates that the proposed model is satisfactory with a high goodness-of-fit assessment.

**Table 5.** The result of SEM.

Indicators		Research Constructs	$\lambda$	t-value	$p$ -value
ERB1	←		0.93***	17.917	0.000
ERB2	←	Environmental	0.767***	18.39	0.000
ERB3	←	Responsible Behavior	0.792***	A	0.000
ERB4	←	(ERB)	0.811***	22.093	0.000

## Continued

ERB5	←		0.894***	18.524	0.000	
ERB6	←		0.845***	19.53	0.000	
CEB5	←		0.813***	17.489	0.000	
CEB6	←		0.785***	18.415	0.000	
CEB4	←	Community Economic Benefits (CEB)	0.817***	17.294	0.000	
CEB2	←		0.772***	18.03	0.000	
CEB1	←		0.805***	18.202	0.000	
CEB3	←		0.789***	11.88	0.000	
PILO6	←		0.737***	14.098	0.000	
PILO5	←		0.812***	15.119	0.000	
PILO4	←	Perceived impacts on livelihood outcomes (PILO)	0.807***	14.96	0.000	
PILO3	←		0.783***	14.633	0.000	
PILO2	←		0.694***	A	0.000	
PILO1	←		0.725***	13.672	0.000	
TPEI6	←			0.847***	A	0.000
TPEI5	←			0.865***	22.664	0.000
TPEI4	←	Tourism Product Eco-Innovations (TPEI)	0.763***	18.555	0.000	
TPEI3	←		0.818***	23.266	0.000	
TPEI2	←		0.86***	22.84	0.000	
TPEI1	←		0.846***	21.932	0.000	
COE3	←			0.898***	26.675	0.000
COE2	←		Community Engagement (COE)	0.907***	A	0.000
COE1	←	0.832***		23.032	0.000	
SCBET5	←		0.773***	17.462	0.000	
SCBET4	←	Support for CBET (SCBET)	0.832***	A	0.000	
SCBET3	←		0.785***	17.845	0.000	
SCBET2	←		0.83***	19.386	0.000	
HEE1	←			0.603***	A	0.000
HEE3	←		0.614***	12.852	0.000	
SOE1	←	Co-Creation Experience (CCE)	0.879***	12.987	0.000	
SOE2	←		0.733***	11.685	0.000	
SOE3	←		0.75***	14.098	0.000	
<b>Path Relationships</b>						
<b>Hypothesis 1:</b> TPEI → CEB (Accepted)			<b>0.221***</b>	<b>3.814</b>	0.000	
<b>Hypothesis 2:</b> COE → CEB (Accepted)			0.11**	2.64	0.008	
<b>Hypothesis 3:</b> CCE → CEB (Accepted)			0.101**	2.471	0.013	
<b>Hypothesis 4:</b> SCBET → CEB (Accepted)			0.135**	2.626	0.009	
<b>Hypothesis 5:</b> PILO → CEB (Accepted)			<b>0.493***</b>	<b>8.344</b>	0.000	
<b>Hypothesis 6:</b> CEB → ERB (Accepted)			<b>0.93***</b>	<b>15.758</b>	0.000	

**Note:** A = parameters of regression weight fixed at 1.000, and  $p$ -value significance level of  $<0.05$  and a  $t$ -value of  $>1.96$ . \*\*\* $p < 0.001$ , \*\* $p < 0.05$ .  $\lambda$  = Standardized Estimates. Environmental Responsible Behavior (ERB); Community Economic Benefits (CEB); Perceived impacts on livelihood outcomes (PILO); Tourism Product Eco-Innovations (TPEI); Community Engagement (COE); Support for CBET (SCBET); Co-Creation Experience (CCE).

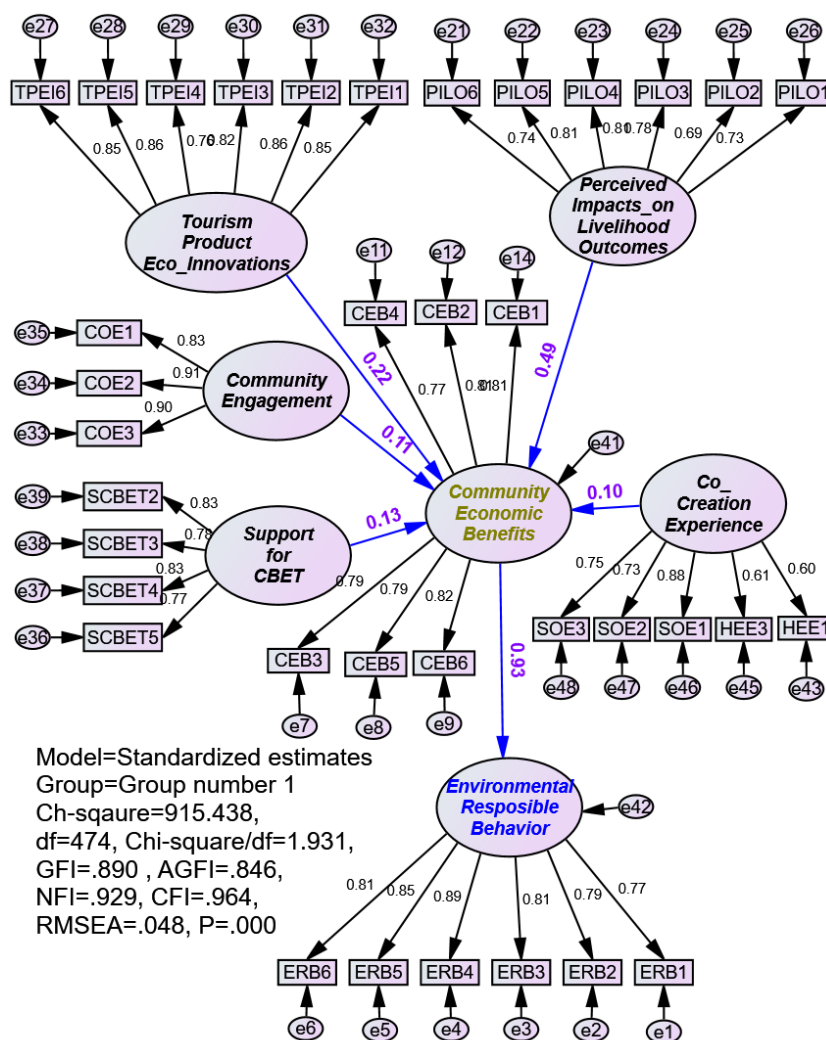


Figure 2. The result of SEM.

The SEM model reveals that the relationship between “tourism product eco-Innovations” and “community economic benefits” has a significant positive impact with coefficient  $\beta = 0.221^{***}$ , t-value = 3.814, and  $p$ -value = 0.000. Thus, hypothesis 1 is accepted. The relationship between “community engagement” and “community economic benefits” has a significant positive impact with coefficient  $\beta = 0.11^{**}$ , t-value = 2.64, and  $p$ -value = 0.008 ( $p < 0.05$ ). Thus, hypothesis 2 is accepted. The relationship between “co-creation experience” and “community economic benefits” has a significant positive impact with coefficient  $\beta = 0.101^{**}$ , t-value = 2.471, and  $p$ -value = 0.013 ( $< 0.05$ ). Thus, hypothesis 3 is accepted. The relationship between “support for CBET” and “community economic benefits” has a significant positive impact with coefficient  $\beta = 0.135^{**}$ , t-value = 2.626, and  $p$ -value = 0.009 ( $< 0.05$ ). Thus, hypothesis 4 is accepted. The relationship between “perceived impacts on livelihood outcomes” and “community economic benefits” have a significant positive impact with coefficient  $\beta = 0.493^{***}$ , t-value = 8.344, and  $p$ -value = 0.000. Thus, hypothesis 5 is accepted. The relationship between

“community economic benefits” and “environmental responsible behavior” have a significant positive impact with coefficient  $\beta = 0.93^{***}$ ,  $t$ -value = 15.758, and  $p$ -value = 0.000. Thus, hypothesis 6 is accepted.

Firstly, the research finding also indicated that “community economic benefits” and “environmental responsible behavior” have the strongest coefficient with  $\beta = 0.93^{***}$ ,  $t$ -value = 15.758, and  $p$ -value = 0.000. Thus, “community economic benefits” are important in enhancing environmental responsible behavior in the eco-tourism context. Secondly, this finding identified that “perceived impacts on livelihood outcomes” significantly improve “community economic benefits” in seven eco-tourism destination sites in Cambodia. Lastly, all relationship with the proposed hypotheses is significantly supported by this study with the structural equation modeling technique.

## 5. Discussion

This study has conceptualized a research framework by integrating and applying key concepts from marketing brand management to destination aspects in eco-tourism contexts. According to the results shown in **Table 5** and **Figure B1** of SEM, all research hypotheses are significantly supported by this study in seven eco-tourism destination sites in Cambodia—the relationship between research hypotheses and existing results with the previous studies. Research findings indicated that “community economic benefits” are most important in enhancing “environmental responsible behavior” for local tourism service providers in seven eco-tourism sites. Then, “perceived impacts on livelihood outcomes” are also one of the key impacts among other research variables on community economic benefits in eco-tourism destination sites. Therefore, this study assumes that “socio-cultural attribute”, “tourism product eco-innovations”, “support for CBET”, and “community engagement” play a critical role in enhancing “community economic benefits” for local eco-tourism people, which lead to strengthening the sustainability for “Environmental responsible behavior”, respectively.

Rural tourism SMEs often lack innovation due to remoteness, costs, lack of resources, and situational factors [88]. These barriers often lead to short-term operational challenges rather than long-term sustainability contributions. Owner-managers of tourism SMEs often lack skills, expertise, or resources for innovation, neglecting the long-term sustainability consequences of their actions [89]. Indeed, tourist entrepreneurs often lack commercial acumen and innovation capacity, requiring strong support and resources [90]. Promoting innovation requires considering factors like gender, age, education, and informal investments [91]. Governments must adopt these findings to foster industry innovation [92]. The tourism and hospitality industry’s future depend on supportive policies, entrepreneurial skills, and social and sustainable entrepreneurship [93]. Most recent study reveals a significant difference between product/service and process innovation in tourism firms, with process innovation being crucial for eco-innovation implementation, while product innovation has no significant impact on 198 tourism

firms in Spain [47]. However, our current study supports Hypothesis 1 by showing that “tourism product eco-innovations” contribute significantly (22.10%) to “community economic benefits” in five CBET contexts.

According to research findings for Hypothesis 2, community engagement is crucial for enhancing local economic well-being (11.0%) in Cambodia’s community-based ecotourism (CBET). Active participation in local communities leads to economic benefits from ecotourism activities. By promoting cultural exchange and decision-making, communities can leverage resources, leading to increased income and sustainable development. This collaborative approach strengthens community structures and ensures long-term success. This current research finding aligns with the arguments of research scholars who assert that community engagement significantly enhances living standards and contributes to the economic benefits of the local tourism community [94]. Indeed, community-based conservation (CBC) is a strategy for improving resource management through community engagement, contrasting traditional methods that rely on customary laws. Respondents in CBC areas prioritize communal benefits, are more willing to conserve resources, and generate income for community economic benefits [95].

According to the research findings of hypothesis 3, Cambodia’s community-based ecotourism (CBET) uses co-creation experiences to boost local economies (10.10%). By involving local communities in tourism design, tourists engage more deeply, promoting cultural authenticity. This approach attracts more visitors, boosts local income, and empowers local businesses and artisans. CBET also stimulates job creation, improves quality of life, and preserves cultural identity. The current research aligns with existing evidence, showing significant correlations between co-creation experiences and local economic benefits in cultural heritage festivals in Greece (*i.e.*, [96] [97]).

Hypothesis 4 represents the crucial role of support for community-based ecotourism (CBET) in Cambodia in enhancing community economic benefits. Stakeholder engagement, including government support, NGOs, and private sector involvement, plays a significant role in fostering the growth of CBET initiatives. This backing helps to develop infrastructure, promote local products, and provide training for community members in tourism management. As a result, communities can better leverage their natural and cultural resources to attract tourists, leading to increased income and employment opportunities. Strengthening support systems not only boosts economic resilience but also promotes sustainable development, ensuring that local communities reap the rewards of ecotourism while preserving their heritage. Then, this current research finding is also in alignment with community-based ecotourism (CBET) management in Thailand, which is crucial for enhancing local stakeholders’ economic benefits, promoting natural conservation, and involving local communities in CBET management [61] [98].

In research hypothesis 5, Cambodia’s community-based ecotourism (CBET) benefits local economies by improving livelihood outcomes, access to education, and healthcare resources. Participation in CBET boosts revenue, supports local

businesses, and creates job opportunities. This positive feedback loop strengthens local economies and reinforces commitment to sustainable practices and conservation efforts, ensuring long-term economic and environmental resilience. Indeed, another study found that local communities' involvement level, economic, social, cultural, political, and environmental outcome perceptions significantly influence their sustainable livelihood perception. However, the positive effect of involvement level on behavioral intention did not pass the significance test, and local communities' sustainable livelihood outcome perception had a significant positive impact on behavioral intention to participate in community-based ecotourism (CBET) activities [99]. The study focuses on household-level livelihood improvement, perceived connections between livelihood improvement or outcomes and nature conservation efforts, and attitudes towards protected area management [100]. Thus, our current study has developed a new relationship between perceived impacts on livelihood outcomes and community economic benefits, supporting our findings with existing empirical evidence.

Community-based ecotourism (CBET) benefits local communities by promoting pro-environmental behavior, which contributed by 93% (hypothesis 6). Financial incentives encourage communities to preserve natural resources and biodiversity, fostering a culture of sustainability. This encourages residents to conserve habitats and reduce waste. The financial gains also encourage investment in conservation initiatives and education, which enhance community well-being and ecological sustainability. Pro-environmental community action requires appropriate encouragement and training. Learning and motivational environments are key to expanding communities' capacity to act. Two formats of pro-environmental action are voluntary work and everyday sustainable practices. Evidence shows successful supportive environments for both formats [101].

## **6. Conclusion and Recommendation**

### **6.1. Conclusion**

In conclusion, contemporary research on ecotourism increasingly emphasizes planning and business models to optimize ecotourism management, factoring in elements like visitor experiences, product development, and impact evaluations. Ecotourism destination sites, such as those in Cambodia, prioritize minimizing environmental impact while fostering local empowerment and cultural respect. Notable initiatives like the Chambok and Chi Phat CBET projects exemplify how community-based ecotourism not only aids in the conservation of natural resources but also serves as a revenue source for local communities. This research underscores the significance of sustainable practices in CBET, highlighting the necessity for collaboration among local communities, government authorities, and stakeholders to enhance livelihoods while preserving cultural identity and natural resources. By acknowledging local knowledge and integrating educational programs, Cambodia can ensure that economic growth goes hand-in-hand with environmental conservation, fostering sustainable tourism and a resilient future.

## 6.2. Recommendation

The article suggests strengthening Community-Based Ecotourism Development (CBET) in Cambodia by involving local communities in planning and decision-making processes, integrating sustainable practices, and promoting Cambodia's unique cultural and natural assets. Strategic marketing campaigns, investment in local infrastructure, and government policies should promote CBET and provide a regulatory framework. Future research should evaluate the economic impact, social dynamics, environmental outcomes, and longitudinal studies to identify best practices and challenges. Collaborative efforts are needed to empower local populations, protect natural resources, and create sustainable economic opportunities. Indeed, the local community should be empowered to decide on tourism facilities and wildlife conservation programs, and how the costs and benefits are shared among stakeholders [102]. The CBET sites have been compared to the bottom-up approach to promoting sustainable tourism development, which often fails to translate into the local context and connect with local tourism chains [103]. A bottom-up approach, funded by local people and focusing on the national market, can encourage sustainable development [104]. CBET members must understand consumer needs, identify investment opportunities, and design tailored products that can be marketed domestically and to neighboring countries [105]. However, caution should be applied when generalizing research results, as the CBET approach does not capture other choice factors and may lead to the degradation of pristine natural areas [106]. Future researchers should explore the lack of linking agriculture-tourism linkages (ATL) and explore Tourism-Based Social Enterprises (TSEs) in eco-tourism destinations [107]. TSEs apply market-based strategies to address social problems and offer pathways to innovations to create sustainable solutions for all stakeholders involved [6] [108]. In summary, the research gaps and arguments presented in this study could help researchers develop a concrete research framework to improve cultural and eco-tourism sites in Cambodia or other countries.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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## Appendix 1. Questionnaire Design

### I) Co-Creation Experience

#### *Hedonic Experience* [HEE1 - HEE3]

1) In this community, it is very enjoyable and relaxing to interact with other people

2) In this community, I can be happy by interacting with others

3) In this community, I can stimulate my thinking by interacting with others

#### *Social Experience* [SOE1 - SOE3]

4) In this community, interacting with other members can expand my social circle

5) In this community, interacting with other members can strengthen my friendly relationship with the community

6) In this community, interacting with other members can strengthen my sense of belonging to the community

### II) Tourism Product Eco-Innovations [TPEI1 - TPEI6]

In this CBET...

1) Develops new products inspired by nature

2) Emphasizes the decomposition of the materials of the new products it has developed

3) Uses natural materials in the new products it has developed

4) Emphasizes the recycling of the components of the new products it has developed

5) Emphasizes reducing waste damage from the new developed products

6) Develops new products to use as little energy as possible

### III) Community Engagement [COE1 - COE3]

1) I'd like to participate in management

2) I'd like to attend ecotourism training

3) I'd like to give my own opinions on planning and development.

### IV) Community Economic Benefits [CEB1 - CEB8]

1) This eco-tourism site has changed employment after eco-tourism.

2) This eco-tourism site has changed income after creating eco-tourism communities.

3) This eco-tourism site plays an important role in providing employment opportunities to the local communities.

4) This eco-tourism site is capable of creating enough employment opportunities around the year.

5) This eco-tourism site helps in developing the demand for the surrounding lands at ecotourism destination

6) This eco-tourism site hires local staff and provides training to them as local guides.

### V) Support for CBET [SCBET1 - SCBET5]

1) I want to see tourism remain important

2) I believe tourism should be actively encouraged

- 3) This community should remain a tourist destination
- 4) The tourism sector will continue to play a major role
- 5) The positive benefits of tourism outweigh the negative impacts.

**VI) Perceived impacts on livelihood outcomes Outcomes [PILO1 - PILO6]**

- 1) Impacts on access to public services
- 2) Impacts on maintenance of local culture
- 3) Impacts on sustainable use of the natural resource base
- 4) Impacts on access to sufficient quantities of appropriate food
- 5) Impacts on the residents' ability to obtain appropriate, necessary food
- 6) Impacts on the residents' capacity to cope with natural disasters

**VII) Environmental Responsible Behavior (ERB1 - ERB6)**

- 1) I comply with the legal ways not to destroy the destination's environment.
- 2) I report to the destination administration any environmental pollution or destruction.
- 3) When I see garbage and tree branches, I will make an effort to put them in the trash can.
- 4) If there are cleaning environment activities, I am willing to attend.
- 5) According to the environmental law, I will deter any behavior damaging the environment.
- 6) When I see others' inadequate environmental behavior in this CBET, I will report it to the authorities.

## Appendix 2. Overall CFA

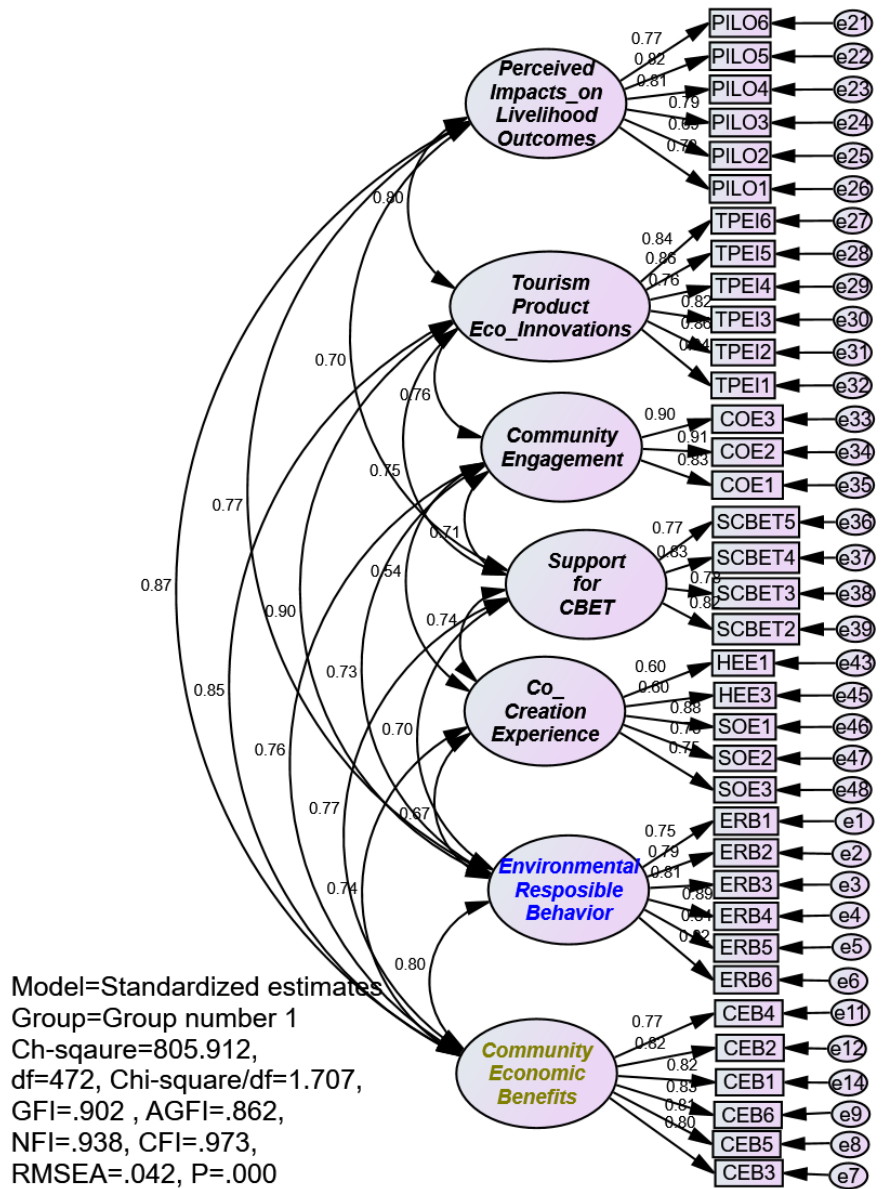


Figure B1. Overall CFA.