

# Studying participatory behaviors of local communities in ecotourism-based natural resources conservation: Using the theory of planned behavior in Zagros Mountains, Iran

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## Original Research

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## Abstract:

Ecotourism has been experiencing rapid growth in various regions, primarily due to its potential for economic development for local communities and environmental conservation. The active involvement of local communities in ecotourism-based natural resources conservation yields mutually beneficial outcomes for both the communities and conservation efforts. This study was conducted in the Galehbol traditional property, located in the Zagros Mountains in western Iran. The natural resources in this area have undergone significant degradation over time due to extensive utilization by the local population. In recent times, policymakers and natural resource managers have recognized the potential of participatory ecotourism plans in reducing local communities' dependency on resources while simultaneously promoting conservation. As a pioneering research endeavor in the region, the main objective of this paper was to examine the intentions and behaviors of the local host community regarding their participation in the conservation of natural resources, utilizing the Theory of Planned Behavior (TPB). To enhance the predictive power of the theory of planned behavior, this study incorporates the variable of Environmental Concern. Data from a sample of 278 local individuals were collected through questionnaires administered between June 2021 and May 2022. The collected data were analyzed using the structural equation modeling and Smart-PLS software. The questionnaire was specifically developed by the researchers for this study. The findings of the structural equation analysis revealed that in the initial TPB model, the three variables of Attitude, Perceived Behavioral Control, and Subjective Norms were collectively accounted for 54.5% and 61.4% of the variance in intention and behavior, respectively. When the environmental concern variable was added to the model, it enhanced the explanatory power to 66.8% for intention and 60.4% for behavior among the local community. The results indicated that attitude and subjective norms, in both the original and extended models, significantly influence the intentions of local communities towards conserving ecotourism natural resources. However, perceived behavioral control did not have a significant effect on intention in either model. On the other hand, the added variable of environmental concern demonstrated a significant impact on both intention and behavior among the local population. By addressing the research gap, this study contributes to a better understanding of the role of environmental concern in the context of conserving natural resources in ecotourism destinations. The findings can also serve as valuable insights for policymakers and natural resource managers in promoting local community participation in ecotourism planning efforts.

**Keywords:** Participatory natural resources conservation; Ecotourism; Community-based management; Forest management

## Introduction

Ecotourism is a form of tourism that involves traveling to relatively undisturbed natural areas to experience and

appreciate ecosystems, wildlife, local cultures, and to contribute to the conservation of the destination's environment (Castellanos-Verdugo et al., 2016). It has been experiencing

rapid growth in many regions due to its potential for achieving economic growth while simultaneously promoting environmental conservation (Barandt and Buckley, 2018). This important part of the tourism sector in terms of economic, environmental, and social aspects is considered as a tool for achieving sustainable development, environmental conservation (Sahani, 2021), preserving biodiversity, and improving people's livelihoods in natural areas, especially conserved areas (Fennell, 2014; Forje et al., 2021). This nature-based activity can diversify people's livelihoods (Nur Syamsi and Lee, 2021; Chan et al., 2021), and provide sustainable management of natural resources, economically (Heshmati et al., 2022; Forje et al., 2021), which helps local communities to reduce the overuse of natural resources (Angessa et al., 2022). Studies show that the recreational value of rangelands, for instance, could be an important economic value (Esfandiari Mehni et al., 2022). Furthermore, the perception of local communities about nature will change after ecotourism projects and their awareness of nature increases (Nur Syamsi and Lee, 2021). One of the most significant benefits of ecotourism is that local people voluntarily avoid activities that are destructive to biodiversity and natural resources and move towards biodiversity-friendly activities. Ecotourism revenues is an incentive to support people in conservation efforts (Khedrizadeh et al., 2017). Effective conservation of natural resources requires a deep understanding of the values that guide behavioral and attitudinal preferences towards these resources (Latifinia et al., 2022b; Azizipor et al., 2024). Natural resource conservation via ecotourism plans can be a dual tool for preserving people's livelihoods and a mechanism to maintain their sources of spiritual communication and traditional behaviors (Ihmezie et al., 2021).

The Zagros Mountains, located in western Iran, represent a significant ecosystem within the country. This region consists of valuable forests and rangelands that play a crucial role in water production, soil conservation, and the livelihoods of local communities. One of the major socio-economic challenges in this area is the low per capita income and the heavy reliance of the local population on these natural resources, which has led to degradation issues (Parma et al., 2017; Khedrizadeh et al., 2017; Khezri et al., 2017; Delpasand et al., 2023). The relative income derived from natural resources ranges from 10% to 21%, depending on household livelihood strategies (Khosravi et al., 2016; Bazgir et al., 2020; Bazgir et al., 2022). However, due to the lack of alternative livelihood options, diversifying the livelihood strategies of local communities has become crucial to alleviate the pressure on natural resources (Bakhshandeh Savadroodbari et al., 2017). More than 60 years ago, Iran implemented the Forest and Rangeland Nationalization Act, which prohibited any use of rangelands and forests without official permission. However, the lack of social acceptance of these laws and other conservation plans resulted in the continuous exploitation of the Zagros natural resources by residents and villagers (Ghazanfari et al., 2004). In recent years, policymakers and managers have turned to Natural Resources-Based Ecotourism (NRBE) as a potential conservation strategy (Motamedi Barabadi et al., 2020).

This strategy aims to diversify the livelihoods of local communities and simultaneously reduce their dependence on forests and rangelands, thereby encouraging the protection of these valuable natural resources. Research has shown that community-based ecotourism can effectively mitigate natural resource degradation (Latifinia et al., 2022a; Lonn, 2019) and land use change. The adoption of NRBE as a conservation strategy offers a potential solution by diversifying local livelihoods and simultaneously reducing dependence on forests and rangelands. The involvement of local communities in ecotourism initiatives is a critical determinant of the effectiveness and success of this strategy (Latifinia et al., 2022b). In contrast, the lack of participation from local communities in ecotourism plans can significantly hinder the effectiveness and success of this strategy (Rafa et al., 2021). As a result, studying the behavioral intentions and behavior of the host local community towards the NRBE has crucial importance. Therefore, the main aim of this paper is to study the willingness of the local communities to participate in EBNRC. This study examines the correlation between local people's intentions and conservative behavior towards participatory ecotourism-based natural resources conservation.

### Theory of planned behavior

The Theory of Planned Behavior (TPB) (Ajzen, 1991) is one of the most widely used theories and models of behavioral intention and actual behavior. Ajzen developed this model not for predicting but for understanding human behavior. Evaluating the planned behavior pattern indicated that the three variables of Perceived Behavioral Control (PBC), Subjective Norms (SNs), and attitudes have indirect effects on behavior (Ajzen, 1991). This theory has abundant applications in explaining environmental behaviors. This model can describe people's behavior by considering the relationships between individual, social, and environmental aspects (Maleknia and Chamcham, 2024). Attitude towards a specific behavior plays a crucial role in determining one's intention to engage in a special behavior. A positive attitude toward a behavior increases the likelihood of its performance (Massoud et al., 2019). Attitudes are composed of emotional and cognitive components, wherein the emotional component reflects an individual's feelings, and the cognitive component reflects their beliefs (De Bruijn, 2010). Subjective norms serve as another significant factor influencing individuals' intentions. They refer to the impact of social approval or disapproval on an individual's intention to perform a behavior. Perceived behavioral control (PBC), the third component, relates to an individual's perception of the ease or difficulty associated with performing a behavior (Ajzen, 1991). Perceived behavioral control focuses on an individual's perception of the feasibility of engaging in a specific behavior. Based on the TPB, the strongest predictor of engaging in a behavior is the intention to do (De Bruijn, 2010); So, intentions represent conscious plans or decisions to engage in a specific behavior (Russell and Fielding, 2010), and they are typically influenced by attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). The TPB has been widely applied in various

studies within the tourism industry. For instance Lee and Jan (2018) employed a theoretical framework incorporating four theories, including the TPB, to examine ecotourism behavior. Their findings supported the hypotheses related to the TPB. Joo et al. (2020) utilized the TPB to evaluate the significant factors influencing rural tourism behavior, revealing that subjective norms and perceived behavioral control have an impact on tourists. Additionally, other studies have explored tourist behavior using the TPB (Ahmad et al., 2020). These studies demonstrated that components of the TPB such as attitudes and beliefs can be effective predictors of conservation-related behaviors such as illegal hunting and deforestation. However, it is important to note the existence of an attitude-behavior gap, suggesting that attitudes alone may not sufficiently predict environmental behavior. Therefore, managers should consider individuals' attitudes and beliefs in conjunction with other underlying factors to effectively promote behavior change (Castilho et al., 2018). While previous research has predominantly focused on studying tourist behaviors using the TPB, there is a research gap regarding the conservation behavior of host communities. To address this gap, the present study aims to investigate the behaviors of local communities concerning their participation in ecotourism-based conservation of natural resources.

### Extension of TPB

Ajzen (1991) showed that in addition to the existing variables of the theory, TPB is essentially able to develop new relationships by adding new variables to get a greater proportion of variance in intention or behavior. Ajzen argued that these new components and relationships can help improve this theory (Ajzen, 2005), and increase the explanatory power of the model in predicting behavior (Ajzen, 1991) as it was confirmed by the research (Azadi et al., 2019; Sultan et al., 2021; Wang et al., 2018). When conducting research in the field of environmental behavior, it is important to consider variables such as environmental concern (EC) as they can significantly influence people's behavior. Therefore, an extended version of the original TPB that incorporates EC may provide a better understanding of the behavior of the ecotourism host community. Thus, our study aims to utilize the extended TPB by including EC to investigate

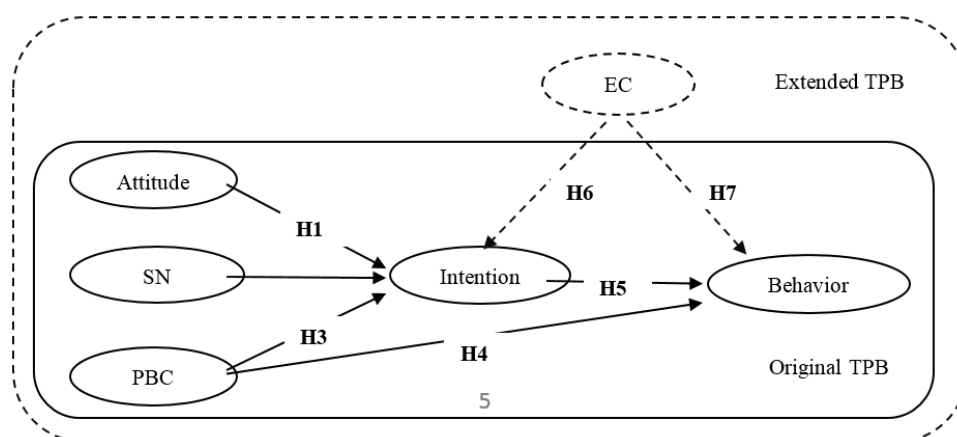
the participatory behavior of the host community with the conservation of natural resources.

Environmental concern is a critical aspect of environmental discussions and is closely linked to responsible environmental behavior (Verma et al., 2019). It refers to the level of awareness individuals have regarding environmental issues and their efforts to address them. In essence, EC represents an individual's negative perception of environmental problems and can influence sustainable environmental consumption (Kilbourne and Pickett, 2008). EC is considered as a fundamental attitude toward environmental conservation (Crosby et al., 1981) and encompasses both cognitive and emotional assessments of environmental protection. Some studies suggest that individuals' ECs are influenced by the perceived risks posed to the environment (Gould et al., 1988; Slovic, 2010). While certain researchers have shown that ECs do not always translate into pro-environmental behavior (Tam and Chan, 2018), others have confirmed the impact of EC on behavioral intentions (Sultan et al., 2021). However, it is important to note that EC should not be viewed as a direct determinant of specific behavior in future research, but rather as a significant indirect factor influencing the behavior (Bamberg, 2003). Due to the inconsistencies found in various studies, further research is needed to explore the relationship between ECs, intentions, and behavior. In our study, we aim to investigate the influence of ECs on intentions and behavior, thereby contributing to filling the existing research gap in this area. Specifically, our research focuses on studying the behaviors of local communities towards their participation in ecotourism-based conservation of natural resources.

### Hypotheses of the original TPB model

According to the variables of the original TPB model, as well as the relationships between these variables, we proposed the following hypotheses (figure 1).

- H1. Hosts' attitude has a positive and significant impact on their intentions toward participating in Ecotourism-Based Natural Resources Conservation (PEBNRC).
- H2. Hosts' subjective norm has a positive and significant impact on their intentions toward PEBNRC.



**Figure 1.** The original and the extended model of TPB, Sn: Subjective norms; PBC: Perceived behavioral control, EC: Environmental concern.

- H3. Hosts' perceived behavioral control has a positive and significant impact on their intentions toward PEBNRC.
- H4. Hosts' perceived behavioral control has a positive and significant impact on their behavior toward PEBNRC.
- H5. Hosts' intentions have a positive and significant impact on their behavior toward PEBNRC.
- H6. Hosts' environmental concern has a positive and significant impact on their intentions toward PEBNRC.
- H7. Hosts' environmental concern has a positive and significant impact on their behavior toward PEBNRC.

According to the topics discussed, we used the original and developed TPB model. Based on this model, the EC variable is an additional variable that has entered the original model. Based on the original model, five hypotheses were proposed, and by the addition of EC, the sixth and seventh hypotheses were proposed.

## Material and method

### The study area

The study area was Qaleh Gol Basin Park in the west of Iran, located at 35 km in the south of Khorramabad city, with an area of 20000 ha. This area is located between the geographical coordinates of latitude  $25^{\circ}43'54''$  to  $27^{\circ}88'11''$  N and longitude of  $36^{\circ}88'474''$  to  $36^{\circ}81'103''$  E (figure 2). Qaleh Gol Basin Park as one of the areas with attractive forests and rangeland, with four sub-basins and 40 villages, is one of the target areas for ecotourism development in Khorramabad. This region has a temperate climate, abundant springs, and pleasant landscapes in the path of Wark, Nojian and Taf waterfalls. Forests and rangelands of this

area have experienced degradation caused by local communities. In recent years, some heavy floods occurred that managers, the public and environmentalists attribute to vegetation degradation. Therefore, governmental organizations of natural resources have been developing some strategies to reduce this degradation. Ecotourism is considered an integral part of these strategies. The study showed that 65% of Galeh Gol visitors are willing to pay to visit this area (Modaberi et al., 2018), which indicates a high potential for ecotourism to reduce local communities' dependency on natural resources. Due to the high capacity of tourist attractions and the ecotourism status of the region, participation of the local society and changing their attitudes and behaviors towards natural resources conservation behavior can reduce the region's natural resources degradation, as well as the sustainability of natural resources and livelihoods. We conducted this research on Galeh Gol traditional property to evaluate the behavior of local people toward participating in this conservation strategy.

### Questionnaire design

The main tool in this study was a questionnaire which included two general parts. The first part involved personal characteristics and demographic information such as age, gender, education, job, and place of residence concerning the villagers. The second part entailed a series of questions to measure the basic and extended constructs of the theory of planned behavior, including 21 items in six subsections including measuring behavioral intention (4 items), attitude (3 items), subjective norms (4 items), perceived behavioral control (3 items), Conservative behavior (4 items), and environmental concern (3 items) which were measured by a five-level Likert scale. These items are represented in Table 1. To evaluate the measured indicators, the draft of the

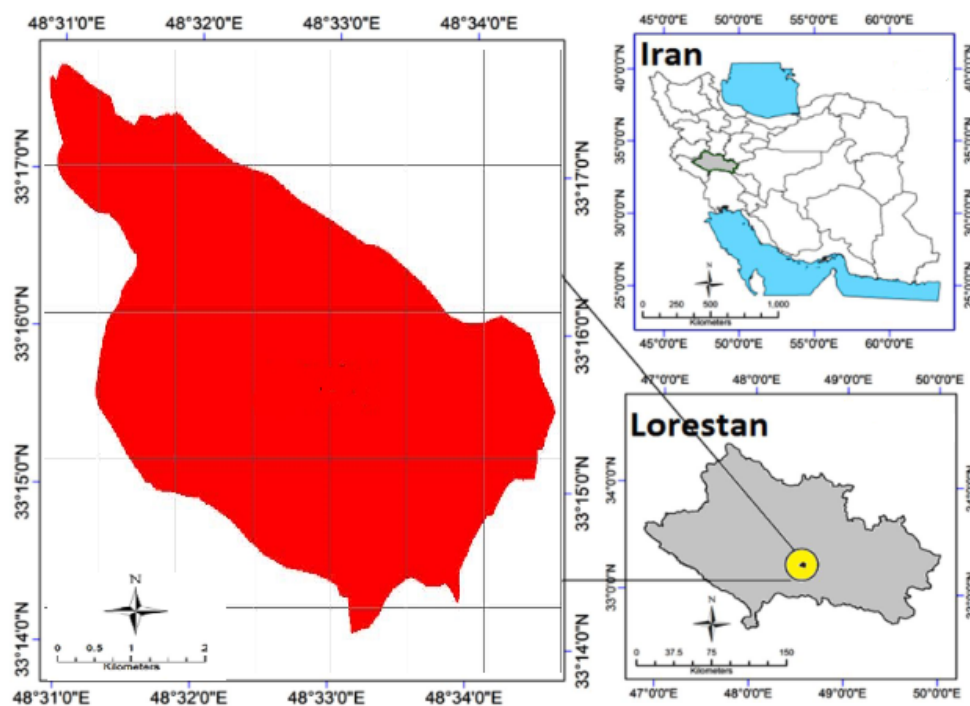


Figure 2. Study area (Iran, Lorestan, Khoramabad city, Qalegol area).

survey and the questions were reviewed by a panel including 9 experts in the fields of forestry, rangelands, watershed, agricultural extension and education, ecotourism, and rural development before entering the interview phase with the villagers. Experts were asked to identify the flaws in the questionnaire. Then, the questionnaire was piloted with 30 local households held in the study area. The integrity of the questionnaire was confirmed by this group. The reliability of the research tool was confirmed by Cronbach’s alpha coefficient, which ranged from 0.7 to 0.9 for different items.

**Sample size and sampling method**

The statistical population of this study included 1000 heads of rural households located in Qaleh Gol Basin Park. Based on Krejcie and Morgan (1970) Table, the sample size was determined to be 278. Sampling was done in a stratified sampling method with proportional assignment. First, the total number of questionnaires was divided among four sub-basins based on the population, and then, 3 villages were selected from each sub-basin and samples were randomly selected. For a better understanding of the questionnaire items, they were explained to the participants face to face. Every participant had enough time to understand and complete the questionnaire. In this step, a local informant accompanied

the team. Data were gathered from June 2021 till May 2022.

**Data analysis**

The collected data were analyzed using SPSS<sub>23</sub> and Smart-PIS<sub>3</sub> softwares. SPSS<sub>23</sub> was used for descriptive statistics. Smart PIS was used for inferential statistics to evaluate the impact of independent variables including subjective norms, attitude, perceived behavioral control and environmental concern on intention and behavior using Structural Equation Modeling (SEM). In the structural equation modeling method, t-values were used to test the research hypotheses using the Bootstrapping command and standardized estimation was used to evaluate the intensity of the effect of variables.

The Average Variance Extracted (AVE), Cronbach’s Alpha ( $\alpha$ ), and Composite Reliability (CR) were used for assessing the reliability and validity of measurement instruments in the research. The Cronbach’s alpha measures the internal consistency of a set of items or scales, providing an estimate of the reliability or the degree to which items in a survey or test measure the same concept. Values above 0.7 are generally considered acceptable. The AVE assesses the amount of variance that a construct captures from its indicators relative to the amount due to measurement error,

**Table 1.** Model variables and measurement items for each variable.

Constructs	Symbol	Measurement item	Sources
Attitude	Attit <sub>1</sub>	Natural resource conservation via ecotourism is a wise thing to do.	Ajzen (2015)
	Attit <sub>2</sub>	Natural resources are a symbol of the region and should be conserved.	Empidi and Emang (2021)
	Attit <sub>3</sub>	Participation in ecotourism can result in natural resource conservation.	Massoud et al. (2019)
Subjective Norm	SN <sub>1</sub>	Most of my friends agree that I should participate in natural resource conservation.	Akkuş and Erdem (2013)
	SN <sub>2</sub>	People want me not to destroy natural resources for income.	Ataei et al. (2022)
	SN <sub>3</sub>	People want me to try not to destroy natural resources for agricultural lands.	Ullah et al. (2021)
	SN <sub>4</sub>	People want me not to destroy natural resources for personal utilization.	Empidi and Emang (2021)
Perceived Behavioral Control	PBC <sub>1</sub>	Whether I participate in ecotourism as a conservation measure is entirely up to me.	Sanchez et al. (2018)
	PBC <sub>2</sub>	I am sure I can conserve natural resources if I want.	Empidi and Emang (2021)
	PBC <sub>3</sub>	If I want to participate in forest conservation, no one will stop me.	
Behavioral Intention	Inten <sub>1</sub>	I would like to conserve natural resources.	Sanchez et al. (2018)
	Inten <sub>2</sub>	I am not going to destroy natural resources for income.	Ullah et al. (2021)
	Inten <sub>3</sub>	I am not going to change natural resources into agricultural land.	Sultan et al. (2021)
	Inten <sub>4</sub>	I intend to tackle people from natural resource degradation.	
Environmental concern	EC <sub>1</sub>	I am worried about natural resource degradation.	
	EC <sub>2</sub>	I am afraid that the overuse of land by ecotourists is worrying	Sultan et al. (2021)
	EC <sub>3</sub>	I am worried about the land use change of natural areas into other land uses.	Tam and Chan (2018)
Conservative Behavior	CB <sub>1</sub>	I do not destroy natural resources for income.	
	CB <sub>2</sub>	I report natural resource degradation to official agencies.	Russell and Fielding (2010)
	CB <sub>3</sub>	I warn people if they destroy natural resources.	De Bruijn (2010)
	CB <sub>4</sub>	I help officials in natural resource conservation.	

with a threshold value of 0.5 indicating adequate convergent validity. The CR evaluates the internal consistency of latent variables, similar to Cronbach's alpha but considered a more sophisticated measure, with values above 0.6 deemed satisfactory. Together, these indicators ensure that the constructs used in a study are both reliable and valid, contributing to the robustness of the research findings.

## Results

### Descriptive statistics

The results of demographic information and characteristics (Table 2) indicated that 202 of the samples (72.7%) were male and 76 (27.3%) were female with an average age of 48 years. In addition, 118 subjects (44.42%) had a diploma and less and 77 subjects (6.5%) had a postgraduate degree (bachelor's or higher). In terms of occupation, the agricultural group with 76 subjects (27.3%) had the highest frequency. Findings of household income in the local society revealed that their average monthly income is 176 \$. Furthermore,

the results indicated that the average ownership of irrigated lands, rain-fed lands, and area of garden of the studied local society were 0.1927, 13.2 and 0.1560 ha, respectively. Further, local society surveys indicated that 258 (92.8%) were indirectly dependent on natural resources and 110 subjects (39.6%) used nature for leisure.

### Inferential statistics

#### Evaluating the measurement model

In this section, the goodness of fit was used to evaluate the fit of two measurement models (original and developed). The results of fit indicators indicated that the studied models had a good fit (Table 3).

#### Un-dimensionality

The results of confirmatory factor analysis showed that the standardized factor loadings ( $\lambda$ ) of all selected markers for the intended constructs was significant according to t-value values at 1% error level ( $P < 0.01$ ) (Table 4). Such results

**Table 2.** Respondents demographic characteristics (N = 278).

Demographic information	Group	Number	%
Gender	Male	202	72.7
	Female	76	27.3
Age	25years or younger	39	14.0
	26 – 35 years	46	16.5
	36 – 45 years	47	16.9
	46 – 55 years	45	16.2
	56 – 65 years	36	12.2
	66 years or older	65	23.4
	Mean		48.0
Education	Illiterate	83	29.9
	Junior high school or below	118	42.4
	Senior high school	77	27.7
Profession	Government officer	12	4.3
	Farmer	76	27.3
	Rancher	55	19.8
	Gardener	16	5.8
	Employee	26	9.4
	Other	72	25.9
Monthly income (USD)	80<	3	1.1
	80 – 160	73	26.3
	161 – 240	118	42.4
	>240	7	2.5.0
	No response	77	27.7
	Mean		44.0
Dependency on natural resources	Direct dependence	20	7.2
	Indirect dependence	258	92.8
Use natural resources	Wood	26	9.4
	Grazing livestock	46	16.5
	Medicinal plant	30	10.8
	Fruit	45	16.2
	Apiculture	21	7.6
	Recreation	110	39.6

**Table 3.** A summary of the goodness of fit indices for the measurement model.

Fit index	SRMR	D-G1	D-G2	NFI	RMS-Theta
Suggested Value	<0.10	>0.05	>0.05	>0.90	≤ 0.12
Original TPB	0.06	1.135	0.312	0.99	0.09
Extended TPB	0.07	1.320	0.456	0.98	0.08

TPB = Ajzen’s Theory of Planned Behavior.

provided enough evidence to confirm the un-dimensionality of the selected markers in each of the measurement models. Thus, the selected markers for measuring the research structures were selected correctly.

**Validity and reliability of the measurement model**

The validity and reliability of the research tool indicated that the values of AVE, CR and  $\alpha$  were 0.5, 0.6 and 0.7 higher than the proposed value, respectively (Table 4). Thus, all the latent variables (constructs) of the proposed model had good convergent validity.

**Structural model**

In this section, two basic and developed TPB structural models were used to test the research hypotheses after validating the results of measurement models.

**Original TPB model**

The results of structural equation analysis indicated that in the initial TPB model, the three variables of attitude perceived behavioral control and subjective norms can control 54.5% and 61.4% of the intention, protective behavior of the local society (EB) (figure 3), respectively. In addition, the results of loading factors and t-values indicated that the variables attitude and subjective norms have a significant effect on the behavioral tendencies of the local society toward natural resource conservation in the region. Thus, the first, second, fourth, and fifth hypotheses were confirmed in the initial structural model while the results of loading factors and t-value values revealed that the control of perceived behavioral control on the behavioral intention of the local society failed to leave a significant positive effect on the

**Table 4.** The fit indicators of the models, factor loadings ( $\lambda$ ), and T-values (t).

Constructs	Constructs	Original TPB			Extended TPB		
		Abbreviation	$\lambda$	t	Reliability and Validity statistics	$\lambda$	t
Conservative Behavior	EB <sub>1</sub>	0.800	20.014	AVE: 0.615	0.803	27.383	AVE: 0.604
	EB <sub>2</sub>	0.811	37.815	CR: 0.857	0.820	38.844	CR: 0.859
	EB <sub>3</sub>	0.730	14.684	a: 0.781	0.726	14.969	$\alpha$ : 0.783
	EB <sub>4</sub>	0.766	23.018		0.756	23.253	
Intention	Inten <sub>1</sub>	0.853	35.858	AVE: 0.666	0.854	37.398	AVE: 0.668
	Inten <sub>2</sub>	0.874	45.814	CR: 0.899	0.875	44.724	CR: 0.889
	Inten <sub>3</sub>	0.803	29.216	a: 0.835	0.804	30.724	$\alpha$ : 0.832
	Inten <sub>4</sub>	0.731	20.893		0.738	21.391	
Attitude	Attit <sub>1</sub>	0.841	25.719	AVE: 0.716	0.841	24.43	AVE: 0.714
	Attit <sub>2</sub>	0.823	31.993	CR: 0.881	0.823	32.777	CR: 0.882
	Attit <sub>3</sub>	0.869	45.076	a: 0.779	0.869	45.114	$\alpha$ : 0.779
Subjective Norms	SN <sub>1</sub>	0.842	45.022	AVE: 0.683	0.842	42.863	AVE: 0.684
	SN <sub>2</sub>	0.853	34.382	CR: 0.894	0.852	33.96	CR: 0.896
	SN <sub>3</sub>	0.816	24.192	a: 0.845	0.816	23.867	$\alpha$ : 0.846
	SN <sub>4</sub>	0.796	22.352		0.797	22.418	
Perceived Behavioral control	PBC <sub>1</sub>	0.865	46.275	AVE: 0.685	0.865	47.279	AVE: 0.684
	PBC <sub>2</sub>	0.796	17.812	CR: 0.866	0.768	17.405	CR: 0.866
	PBC <sub>3</sub>	0.845	31.267	a: 0.721	0.845	31.772	$\alpha$ : 0.772
Environmental Concern	EC <sub>1</sub>	-	-	-	0.818	18.408	AVE: 0.685
	EC <sub>2</sub>	-	-	-	0.823	25.145	CR: 0.867
	EC <sub>3</sub>	-	-	-	0.842	43.955	$\alpha$ : 0.781

TPB = Ajzen’s Theory of Planned Behavior  
 AVE = Average variance extracted  
 CR = composite reliability

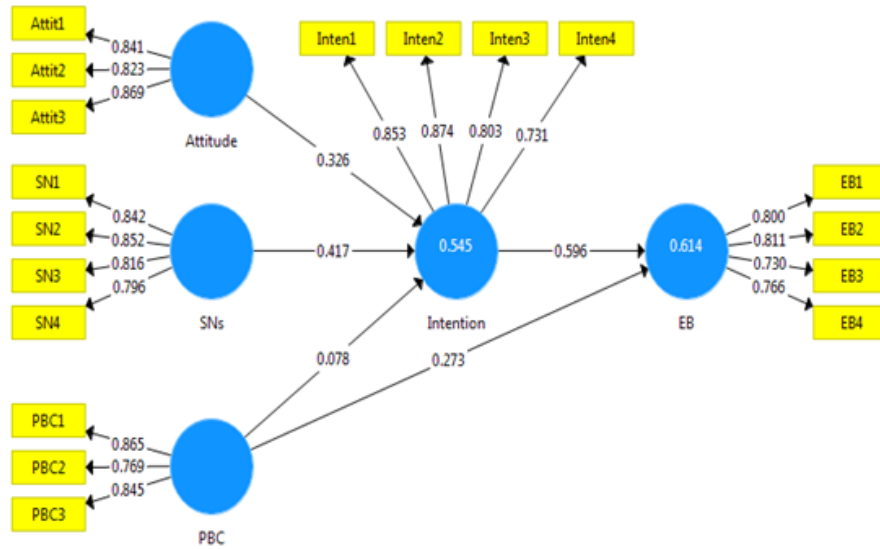


Figure 3. Original TPB structural model with standardized path coefficients the constructs of model are defined in Table 4.

conservation of the region’s natural resources. As a result, the third hypothesis is not confirmed in the initial structural model TPB (Table 5).

**Extended model**

The results of estimating the developed structural model of TPB including the environmental concern variable are shown in figure 4 and Table 5. All the indicators had a good fit similar to the initial structural model. Based on the obtained results, the variables of TPB development model could explain 66.8% and 60.4% of the intention and protective behavior of the local society, respectively. In other words, the developed model by adding the variable of EC could increase 12.8% and 1% of intention and local society conservation behavior, respectively (figure 4 and Table 5).

**Discussion**

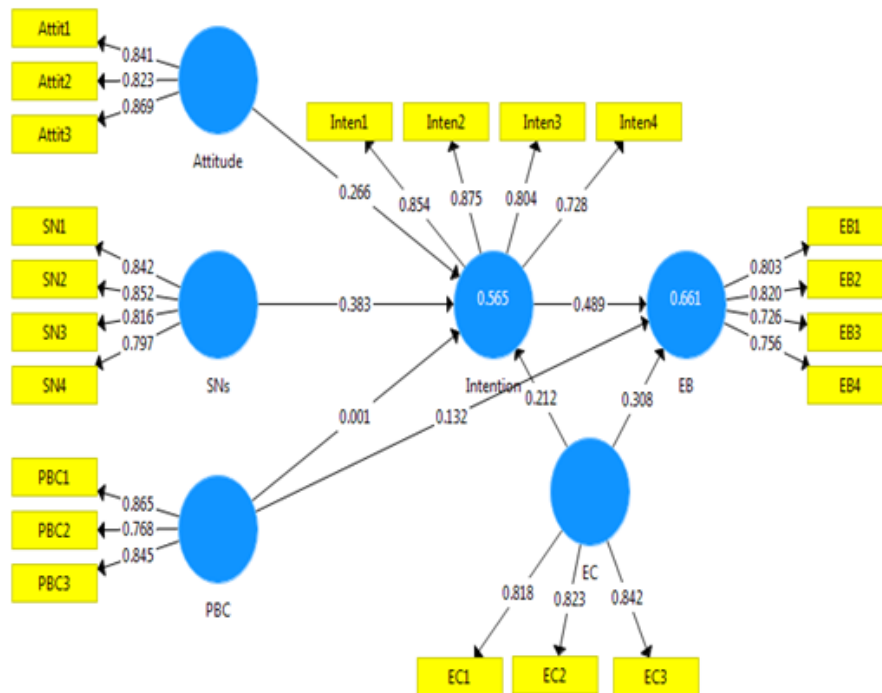
The primary objective of this study was to assess the inclination of the local community engaged in ecotourism to participate in the conservation of natural resources, utilizing the planned behavior model. While the basic model holds considerable analytical power, this study sought to enhance its effectiveness by incorporating the variable of environmental concern. The research hypotheses are sequentially

discussed below.

The results of the study confirmed the first hypothesis, demonstrating that the attitude of the host society had significant positive impact on their willingness to participate in conservation programs based on ecotourism. Prior research studies have consistently shown that positive environmental conservation attitudes have a substantial impact on the propensity for ecotourism-based conservation (Wang et al., 2018; Sultan et al., 2021). Strengthening the attitude of the host society through educational programs such as awareness-raising initiatives and promoting ecotourism from both conservation and economic perspectives is crucial. Additionally, the utilization of social and local media platforms is essential as studies have indicated that social networks can serve as a complementary and cost-effective resource for conservation challenges. The results also revealed that subjective norms significantly impact the willingness of individuals to participate in ecotourism-based conservation programs, aligning with previous research findings (Wang et al., 2018). Subjective norms refer to beliefs reinforced by significant groups or individuals in an individual’s life (Farradia et al., 2021). Therefore, the establishment of various advocacy groups for natural conservation, strength-

Table 5. Hypothesis Results of research and structural models.

Hypothesis	Original TPB			Extend TPB		
	$\gamma$	t	Result	$\gamma$	t	Result
H1: Attitude → Intension	0.326	4.77	confirm	0.266	3.83	confirm
H2: SNs → Intension	0.417	5.36	confirm	0.383	4.89	confirm
H3: PBC → Intension	0.078	1.88	Not confirm	0.001	0.05	Not confirm
H4: PBC → EB (Behavior)	0.273	4.19	confirm	0.132	2.07	Not confirm
H5: Intention → EB(Behavior)	0.596	10.42	confirm	0.489	8.96	confirm
H6: EC → Intension	-	-	-	0.212	3.55	confirm
H7: EC → EB (Behavior)	-	-	-	0.308	6.00	confirm



**Figure 4.** Extended TPB structural model with standardized path coefficients. The constructs of model are defined in Table 4.

ening environmental non-governmental organizations, and promoting education and public awareness can foster such beliefs within society. Strengthening these beliefs within social groups including friends, relatives, and other community networks can positively influence individuals’ mental beliefs regarding participation in ecotourism-based natural resource conservation programs. Contrary to some other studies (Wang et al., 2018), the third and fourth hypotheses were not confirmed, indicating that perceived behavioral control does not have a significant positive effect on individuals’ desire and behavior to participate in conservation programs. This discrepancy could be attributed to the stronger influence of other components within perceived behavioral control (Castilho et al., 2018). Perceived behavioral control reflects the extent to which individuals feel in control of their actions that support the environment. The lack of past participatory programs and centralized planning may contribute to a lack of self-confidence within the host society. Thus, it is essential to bolster self-confidence through actionable measures that provide opportunities for environmental behaviors. Encouraging environment-friendly forces actively engaged in the field and involving residents can pave the way for the development of appropriate environmental behaviors within the eco-tourism area. Additionally, organizing festivals and related competitions focused on natural resources and implementing participatory programs with the involvement of local people can be effective in this regard. The results of this study, along with numerous others (Wang et al., 2018), confirmed that intention has a significant positive effect on behavior. Considering the mediation of intention and the impact of other variables within the TPB model as well as the impact of intention on societal behavior emphasizes the significance of the aforementioned

factors. In other words, the two model variables, attitude and subjective norms indirectly influence the behavior of the host society. Therefore, the suggested actions mentioned earlier will directly strengthen behavioral intention and the behavior of the host society towards participating in natural resource conservation based on ecotourism.

The environmental concerns of the host society regarding natural resource conservation in the study area exhibited a positive effect on their willingness and behavior to participate in ecotourism-based conservation programs. This component represents a significant aspect that was specifically addressed in this study and was absent from the initial model. Other studies have examined the positive impact of tourists’ environmental concerns on their desires and behavior (Mehmetoglu, 2010; Sultan et al., 2021). However, the evaluation of this component has received less attention within the host society. By considering this variable, the explanatory power of the model was strengthened. The items employed to measure the environmental concerns of the host society encompassed their level of concern regarding noise, water, and air pollution resulting from tourist activities in the environment. Fostering a sense of concern within the host society regarding potential issues in the area is of utmost importance. It is necessary to elucidate the significance of natural resource conservation and its role in the sustainable economic development of the region. Stimulating the host society’s sentiment towards engaging in protective behaviors can be achieved through the presentation of videos showcasing degraded ecotourism areas and their effects on local networks. Furthermore, it is recommended to facilitate the establishment of non-governmental organizations and encourage public participation in environmental conservation efforts. Continued activity of these groups and

increased community involvement will enhance the environmental concern of organization members towards the ecotourism destination's environment.

## Conclusion

The preservation of environmental sustainability in ecotourism destinations is a widely recognized objective within the field of ecotourism, supported by researchers, managers, and planners. An important factor influencing the sustainability of these areas is the active participation of the host society in participatory management for the development of ecotourism and conservation practices. In addition to examining the environmental behaviors of the host society, their involvement in ecotourism-based conservation programs serves as a meaningful measure. Therefore, studying the responsible environmental behavior of the host society is a crucial step in this direction. To investigate the REB of the host society, the TPB model was employed due to its wide applicability across various fields. Additionally, an innovative enhancement was made to the TPB model by incorporating the EC variable, thereby increasing its explanatory power. While most previous studies have primarily focused on evaluating the behavior of tourists, this study uniquely centers on the local society by introducing a variable to the original model. By selecting an ecotourism host community and examining its behavior, along with the inclusion of the EC variable in the TPB model, this study effectively fills a research gap in this field. The findings of this research significantly contribute to the understanding and awareness of ecotourism planners regarding the factors that influence the REB of the host society. Moreover, the discussion section of this article provides practical suggestions for ecotourism and natural resources managers, whose implementation can substantially enhance the sustainability of ecotourism destinations through increased participation of the host society. This active involvement can pave the way for effective protection of the region's forests and rangelands. Moving forward, there are promising prospects for future research in the field of REB within the host society. While research on responsible environmental behavior among tourists has been underway for several years, a review of the existing literature reveals that studies focusing on the host society are still in their early stages. The present study represents one of the initial attempts in Iran aimed at bridging this research gap. Given the diverse natural environments found in various ecotourism destinations (such as mountains, seas, forests, rangelands, valleys, and deserts), coupled with cultural differences across different parts of the world, it is recommended to conduct more studies on REB among tourists in different global regions. Finally, it is important to acknowledge the limitations of this research. The primary limitation relates to the challenge of establishing communication and trust with the local community as statistical samples. Local residents often exhibit skepticism towards foreigners, particularly when it involves gathering data about their businesses. To gain the trust of respondents, the research team enlisted the assistance of university students and elderly individuals

residing in the study area. These students and elderly participants accompanied the research team, facilitating data collection. Another limitation pertains to the timing of data collection, which coincided with the outbreak of the Covid-19 pandemic. To overcome this limitation, the research team strictly adhered to health protocols during data collection.

### Authors contributions

Authors have contributed equally in preparing and writing the manuscript.

### Availability of data and materials

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

### Conflict of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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