



Ecotourism through the perception of forest villagers: understanding via mediator effects using structural equation modeling

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Received: 9 March 2022 / Accepted: 12 May 2022 / Published online: 19 May 2022
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Abstract

Ecotourism activities play an important role in providing economic gain to villagers living in forest ecosystems. Successful sustainable forest management is made possible through the environmental responsibility of the stakeholders and the support of the local inhabitants of the region. Contemporary studies conducted in ecotourism have focused on meeting regional expectations by assessing the satisfaction levels and attitudes of tourists and evaluating hotel management services, but have excluded the perspective of the rural people in the region. Using causal models and mediation effects, this study attempted to explore the attitudes of forest villagers, as the most important interest group, toward ecotourism activities in Turkey. Structural equation modeling and bootstrap methods were applied to identify key concepts related to ecotourism including the mediation effects between income opportunities and ecotourism satisfaction as perceived by the forest villagers regarding perceived negative effects and insufficient services. According to the results of the research, it was determined that, despite the perceived negative effects of ecotourism activities by the forest villagers, income opportunities made a strong positive contribution to their perceived ecotourism satisfaction. Study results offer significant implications for policymakers and ecotourism planners for decreasing pressure on forest ecosystems through participatory forest management approaches to sustainable development in rural areas associated with forest ecosystems.

Keywords Ecosystem services · Forest villagers · Sustainable rural development · Structural equation modeling · Turkey

Introduction

Forest ecosystems are critical areas throughout the world that contribute to several United Nations (UN) Sustainable Development Goals (SDGs) (Swamy et al. 2018). Forest ecosystems provide many services, especially as sources of wood raw materials and non-wood forest products, and as environmentally sensitive areas for recreation and for enjoying the aesthetic qualities and fresh air, etc. (Oztürk et al. 2009; Deniz and Paletto 2018). Ecotourism is one of the important services provided by forest resources (Chiu et al. 2014). For a better understanding of the ecotourism concept, it is necessary to examine accounts describing the periods when environmental concerns began to arise.

In this regard, the report titled “The Limits to Growth” drew attention in the early 1970s. It explained for the first time that a sustainable environment for people could be achieved through sustainable development (Meadows et al. 1972). Subsequent reports, including “Our Common Future,” “Agenda 21,” and “The Rio Declaration,” are important milestones in drawing up a comprehensive framework that can achieve sustainable development by establishing a delicate balance in the use of the environment and natural resources (Evin and Demiral 2018; Kalaitan and Stybel 2021). Since the declaration of the “World Ecotourism Year” in 2002 by the UN World Tourism Organization (WTO), many researchers have defined the concept of ecotourism by emphasizing that it should be carried out by environmentally responsible people, and keywords were formulated such as *environmental sustainability*, *respect for nature*, *generating income in rural areas*, *welfare economy*, and *rural development* (Fennell 2013; TIES 2015; Kalaitan and Stybel 2021). The “Paris Agreement” and the “Green Deal” are crucial developments for ecotourism because they are the latest important

Responsible Editor: Philippe Garrigues

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documents to determine and apply the means to reach a sustainable future. All these studies point out that environmental sustainability and sustainable development are achievable by developing the welfare of the local inhabitants and carrying out effective green economic practices while at the same time protecting natural resources (Yang et al. 2020).

Studies conducted to determine the demographic characteristics of ecotourists in recent years have revealed the profile of this type of tourist. Ecotourists are a highly educated, middle-aged group of experienced tourists having a high average income, interested in gastronomy and culture, and who conduct research about travel (Björk 2000; Rezaei et al. 2018). Unlike those who travel to European countries, in Turkey, young and middle-aged people participate more in ecotourism activities (Gültekin et al. 2017; Bu et al. 2021). However, in terms of ecosystem services, ecotourism activities raise important concerns in Turkey, as they mostly take place in protected, environmentally sensitive, natural forest, and rural areas (Celik 2018). Rural people living in the immediate vicinity of Turkey's forests, according to Forest Law no. 6831, are designated as "forest villagers" (Unal et al. 2021). Forest villagers have relatively low levels of income and education and the communities struggle with unemployment in Turkey. Their main livelihood is based on agricultural and forestry activities (Durkaya et al. 2017; Erdoğan and Uyan Semerci 2020). When ecotourism activities are expanded, these developments can both reduce pressure on forest ecosystems and contribute to the well-being of rural households as alternative income opportunities (Gautam and Andersen 2016).

The coronavirus pandemic (COVID-19) created a reverse migration trend from big cities to rural areas. However, in terms of ecotourism activities, with the efforts to access healthy living and food, the focus was turned to agrotourism (Ling 2017; Herczeg 2020). In addition, with restrictions on mass tourism and the various risk factors due to the pandemic, a tendency emerged toward small-scale, green hotels in more isolated locations (Apostolakis et al. 2020). Transforming this new process into alternative sources of income for rural people and, subsequently, reducing income inequality and the unemployment rate can lead to new initiatives (Huang and Liu 2017). Ecotourism activities play important role on the revenue opportunities of forest villagers. Improved welfare can also lead to increase of satisfaction level of rural inhabitants (Kry et al. 2020), even though insufficiency and negative environmental perception in ecotourism services income level invert to positive in the rural regions (Huang and Liu 2017; Kibria et al. 2020). Thus, this study aimed to propose policy recommendations for rural development by modeling the perceptions and attitudes of the forest villagers and explaining the mediation roles regarding tourists

coming to the region. The main research questions (RQ) considered were:

RQ 1: Do ecotourism activities have an impact on the environmental concerns of forest villagers living in rural areas of Turkey?

RQ 2: What are the mediation roles between perceived revenue and ecotourism satisfaction?

Conceptual framework

Ecotourism has evolved over time by expanding it with the concepts of natural, environmental, economic, social, and cultural structures as well as integrated rural tourism (IRT) and nature-based tourism (Lane 1994; Wineman et al. 2020) that include agro-tourism, village tourism, sustainable tourism, and tourism activities in rural areas (Nair et al. 2015; Lee and Jan 2018; Dinis et al. 2019; Surjanti et al. 2020). Rural tourism activities with similar definitions carried out in the study area have been evaluated within the scope of ecotourism.

Since the conceptual framework of this study aimed to determine the level of knowledge of rural people about ecotourism activities and model their perceptions and attitudes towards ecotourism components together with mediation roles, it was more appropriate to establish the conceptual framework within this scope. In terms of terrestrial ecosystems and the forest areas in Turkey, the main elements of the objective are of key importance for rural communities settled in sensitive environmental ecosystems (Gültekin 2019). This aspect of the study is significantly related to eliminating unemployment and poverty and promoting the protection of forest resources, both of which are among the UN SDGs. All manner of production and commercial activities to be carried out in such areas of importance should be planned, implemented, and monitored by taking into account the balance of the ecosystem (Jamrozy and Lawonk 2017; Dinis et al. 2019; Pain et al. 2021).

The response of the local inhabitants to IRT development is an important factor in ecotourism planning and marketing strategies (Saxena and Ilbery 2010). With ecotourism activities, the relations between the locals and the tourists visiting the region can be a positive tool that benefits sustainable development through the opportunity of an alternative income (Huang and Liu 2017; Kibria et al. 2020). Studies have reported that these income opportunities from ecotourism activities enable local people to improve their standard of living (Hayati and Bahtera 2020). Moreover, ecotourism activities are known to have a positive effect on cultural exchange and rural development by initiating interaction with the local people, thus increasing their earnings and resulting in a more positive

ecotourism satisfaction level (Kim and Park 2017; Kry et al. 2020). One of the main aims of this study was to use causal models to explain the effects of ecotourism activities on the welfare of forest villagers. Therefore, the first hypothesis to be tested within the scope of the study can be expressed as follows:

H1: Perceived revenue opportunities (PRO) positively associated with perceived ecotourism satisfaction (PES).

Current studies have found different perceptions and attitudes towards ecotourism activities (Juvan and Dolnicar 2016). The main phenomena involve negative effects experienced by the local inhabitants as a result of interactions with tourists coming to the region (Muresan et al. 2016; Kandel et al. 2020). Some studies have shown that this situation negatively affects the development of ecotourism and recreational activities (Cakir et al. 2016). Although the positive values expected by the participants as a result of ecotourism activities are high, some negative perceptions adversely affect the expectations and satisfaction of ecotourists (Chan and Baum 2007; Huang and Liu 2017; Lee and Jan 2018). In addition, problems and imbalances in ecotourism services can also lead to a negative perception of the quality of service in ecotourism activities (Yusof et al. 2014; Huang and Liu 2017). Perceived negative effects (PNE) were among the mediation role factors defined in the study, and the hypotheses to be tested were determined as follows:

H2: Perceived revenue opportunities (PRO) negatively associated with PNE, and

H3: Perceived negative effects (PNE) negatively associated with PES.

As the income level and welfare of the local people increase, efforts will be made to increase the satisfaction of the ecotourists by giving more attention to ecotourism services (Kibria et al. 2020; Kry et al. 2020). In this context, another purpose of this study was to identify the root problems underlying the relations between PRO and PES by determining the views of forest villagers towards ecotourism. Consequently, it was necessary to test the factors that were thought to underpin and explain the local perception of ecotourism using mediation roles between PRO and PES through the following hypotheses:

H4: Perceived insufficient services (PUS) take part a mediator effect of perceived revenue opportunities (PRO) on PES,

H5: Perceived revenue opportunities negatively affect PUS,

H6: Perceived insufficient services negatively affect PES, and

H7: Perceived insufficient services negatively mediate the relationship between PRO and PES.

Material and methods

Study area

The target audience of the study consisted of the forest villagers living in Düzce Province, which has a large number of ecotourism activities and potential destinations. Approximately half (49%) of Düzce Province, in the western Black Sea Region of Turkey, is covered by forested areas where ecotourism activities are diverse and extensive (Gültekin et al. 2017). In addition, the research area was chosen because the transportation network from metropolitan cities such as Istanbul, Ankara, Bursa, Kocaeli, and Sakarya to this region is efficient and convenient, and those who visit ecotourism areas are also highly similar to the people living in the region. The wide variety of ecotourism activities in Düzce such as nature hikes, rafting, paragliding, botanical tours, trekking, and agrarian tours are mostly carried out in forest areas and their immediate surroundings. These features increase the attractiveness of ecotourism in the region (Gültekin 2019).

Questionnaire design and analysis

The research population consisted of forest villagers living in the western Black Sea province of Düzce (Turkey), which encompasses 278 forest villages including a total population of 395.679 (TUIK 2020). Ecotourism-related scales and factors (Kiper et al. 2011; Oviedo-García et al. 2017; Huang and Liu 2017; Kim and Park 2017; Gültekin et al. 2017) were adapted to facilitate communication with the forest villagers in Düzce and used to analyze the relationships between PRO, PES, PNE, PUS, and mediation roles (Fig. 1). The surveys were administered in the forest villages

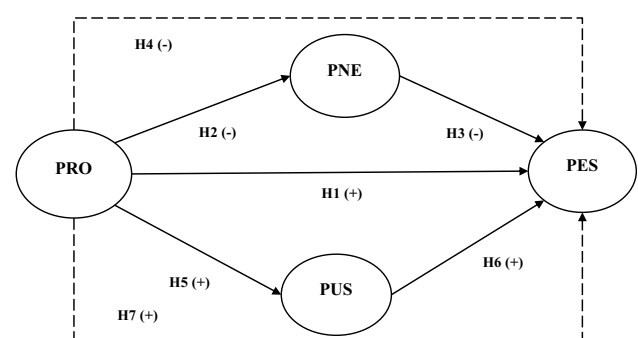


Fig. 1. Conceptual framework of the research model. PRO, perceived revenue opportunities; PES, perceived ecotourism satisfaction; PNE, perceived negative effects; PUS, perceived insufficient services.

of Aydınpinar, Güzeldere, Samandere, and Yığılca, where ecotourism activities are carried out extensively in the forest areas. The developed questionnaire forms were applied between December 2018 and July 2019. The 5-point Likert type questionnaire form was designed in a way that all participants could easily understand and respond to it in 10–15 min. Forest villagers randomly selected according to their willingness to participate to survey. Therefore, as a result of the study, 420 questionnaire forms were obtained from inhabitants living in four different forest villages in Düzce.

According to the theoretical model and also to better explain the mediation roles between the latent variables, this study used structural equation modeling (SEM) along with bootstrap methodologies. Both techniques provide the ability to test all interrelationships, direct effects, and indirect effects simultaneously and to statistically control the hypotheses presented in the models (Danielson et al. 2001; Kline 2015). Moreover, the SEM approach enabled the comparison of empirical environmental data with a theoretical model (Kayacan and Gültekin 2012; Gültekin 2022). The basic features of the SEM model provide the ability to estimate multiple interrelated dependent relationships and to represent unobserved variables in these relationships, while taking estimation measurement errors into account (Byrne 2010).

In order to evaluate the SEM models, the sample size of 100 is sufficient. At least 15 cases suggest for each variable are adequate in path analysis method. The principal measurement criteria used in the study included chi-square (C), minimum value of the discrepancy function (CMIN), degrees of freedom (DF), comparative fit index (CFI), goodness of fit index (GFI), normed fit index (NFI), relative fit index (RFI), incremental fit index (IFI), Tucker-Lewis index (TLI), root-mean-square error approximation (RMSEA), and root mean residual (RMR). These values denoted the accepted goodness of fit (GOF) cutoff criteria determined in the structural models (Hu and Bentler 1999; Schumacker and Lomax 2004; Kline 2015; Gültekin 2022). In accordance with SEM methodology and theory, some error terms were correlated only with the same latent variable in order to achieve improved GOF values. By computing each scale separately, Cronbach's α (reliability) values of higher than 0.60 could be achieved. Furthermore, the factor loadings demonstrated that the validity of the scales had exceeded the established lower limits. The SEM approach

was implemented for confirmatory factor analysis (CFA) by applying maximum likelihood (ML) estimation to evaluate the multi-dimensionality of PES, PRO, PUS, and PNE (Byrne 2010; Kline 2015).

The path diagram presents the relationships between PES and PRO, where indicator variables are shown as rectangles and latent variables as ovals. A regression coefficient is indicated by each arrow from one latent or observed variable to another (Fig. 2). Each oval with an arrow to a latent or observed variable indicates the error term. Double-pointed arrows pointing between error terms indicate the covariances. In the model, there were three observed, endogenous variables (PRO1-PRO3) and two observed variables (PES1-PES2), i.e., five observed variables. The eight unobserved variables included the endogenous variable (PES) and the unobserved, exogenous variables (PES and $e1$ – $e6$). Thus, the total number of variables in the model was thirteen. The GOF values of the data were acceptable in the details of the hypothesized path model (DF = 4, CMIN = 17.102, $p < 0.002$, RMSEA = 0.088, RMR = 0.028, CMIN/DF = 4.275, NFI = 0.971, GFI = 0.984, TLI = 0.944, CFI = 0.977, and IFI = 0.978).

The indirect effects and mediation model of the original sample were computed as well as the estimated parameters of the β bootstrap samples. In order to achieve improved results at a 95% confidence interval (CI), for the upper and lower bounds, 5000 samples from the original sample size were used (Efron and Tibshirani 1985; Danielson et al. 2001). The suppression effect was also examined in the regression coefficient. It must be reduced from higher to lower level, when the complete model was regarded as being significant (Aglar and De Boeck 2017). The SPSS 22 and AMOS 22 software programs were used to analyze all data.

Results

Table 1 presents the basic demographic characteristics of the respondents. Each scale was assessed for reliability and validity in the first step of the analysis. Table 2 gives the CFA results and includes the scales and the items. The Cronbach's α coefficient values for the PRO, PES, PUS, and PNE scales were 0.687, 0.789, 0.628, and 0.702, respectively, showing them to be sufficiently reliable and valid.

Fig. 2. Hypothesized model 1 (PRO-PES model).

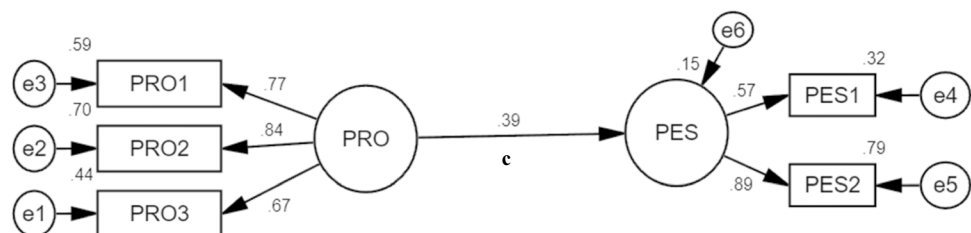


Table 1 Characteristic features of the respondents ($N=420$)

Variables	Frequency (%)	Variables	Frequency (%)
Gender		Monthly income (US\$)	
Male	298 (71)	500 and below	292 (69.5)
Female	122 (29)		
Age (years)		501–1000	70 (16.7)
15–34	138 (32.9)	1001–2000	31 (7.4)
35–49	129 (30.7)	More than 2001	27 (6.4)
>50	153 (36.4)	Occupation	
Educational level		Farmer	249 (59.3)
Middle school and below	296 (70.5)	Housewife	83 (19.8)
High school	98 (23.3)	Self-employed	64 (15.2)
Graduate school	26 (6.2)	Other (student, worker, etc.)	24 (5.7)

Table 2 The results of the confirmatory factor analysis with scales and items.

Scales and items	Factor load	<i>t</i> -value	Cronbach's α
Perceived revenue opportunities (PRO) Scale			0.687*
PRO1: Tourists coming to the region provide income opportunities.	0.765	12.502	
PRO2: I generate income by providing guidance services to tourists coming to the region.	0.828	12.636	
PRO3: I earn income by selling local products to tourists coming to the region.	0.665	-	
Perceived ecotourism satisfaction (PES) Scale			0.789*
PES1: I am satisfied with the tourists coming to the region.	0.606	-	
PES2: I want more tourists come to the region.	0.826	5.960	
Perceived insufficient services (PUS) Scale			0.628*
PUS1: Infrastructure facilities for tourists are insufficient.	0.775	3.866	
PUS2: I feel inadequate in communicating with the tourists coming to the area.	0.553	-	
Perceived negative effects (PNE) Scale			0.702*
PNE1: Tourists coming to the region adversely affect the lifestyle of the local people.	0.404	-	
PNE2: Tourists coming to the region cause environmental pollution.	0.494	6.564	
PNE3: Tourists coming to the area harm the traditions of the local people.	0.801	6.692	
PNE4: Sometimes there is a dispute with the tourists coming to the region.	0.678	6.798	

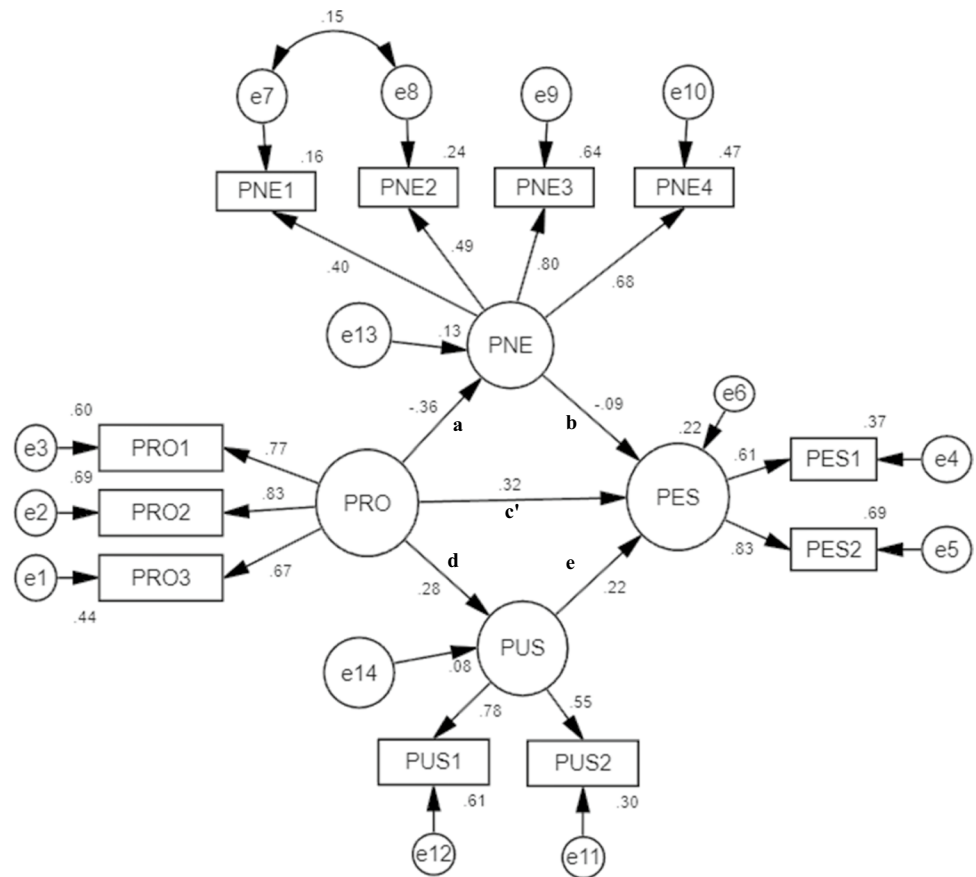
*Each scale is above the threshold ($\alpha > 0.60$)

The data ($\beta = 0.39$, $p < 0.002$) supported Hypothesis 1 (“PRO is positively associated with PES”), i.e., that the PRO of the forest villagers significantly affected their PES. The PRO scale items state that the satisfaction level of rural people is highly correlated with their perception of “generating income by selling local products, earning money by providing guidance services, and providing income opportunities.” The responses of the forest villagers indicated that they were not adequately satisfied with the ecotourism opportunities in the region (PES1 mean = 3.68; PES2 mean = 3.95).

After the first stage of the SEM model, the complete multidimensional model and indirect effects of PNE and PUS were set up to achieve the mediator effects and the relationships between PRO, PES, PNE, and PUS. The complete structural model can be seen in Fig. 3. There were a total of 29 variables in the model. The observed, endogenous variables in the model were PRO1-PRO3 (3 observed

variables), PNE1-PNE4 (4 observed variables), PUS1-PUS3 (2 observed variables), and PES1-PES2 (2 observed variables). There were a total of 11 observed variables. The unobserved endogenous variables were PUS, PNE, and PES and the unobserved exogenous variables were PRO and e_1 – e_{14} (a total of 15 unobserved variables). The values of the full structured model for the model fit criteria were found as follows: $DF = 38$, $CMIN = 68.350$, $p < 0.002$, $CMIN/DF = 1.799$, $RMR = 0.045$, $RMSEA = 0.044$, $GFI = 0.972$, $CFI = 0.971$, $NFI = 0.937$, $TLI = 0.958$, and $IFI = 0.971$. These indices were used in the determination of the efficiency of the SEM models and indicated that the hypothesized path model fit was acceptable. When the PUS and PNE were considered as mediators and included in the structural models, it confirmed that the relationship between the PRO and PES differed in the regression coefficient. Moreover, with the suppression effect, the regression coefficient was reduced from

Fig. 3. Complete mediated model (PRO-PNE-PUS-PES model).



0.39 to 0.32, i.e., when the complete model was regarded as being significant for the PRO and PES of the forest villagers, the PUS and PNE were highly effective. Table 3 presents the complete multidimensional model and indirect effects of PUS and PNE, and the total effects between PES (path

c) and PRO. The estimates (bias-corrected 95% CI) of the indirect effects calculated via the bootstrap analysis using 5000 replications revealed the significant mediator effects of the relationship between PES and PRO and PUS and PNE ($\beta = 0.073$, lower bound = 0.007, upper bound = 0.170).

Table 3 Results of complete mediation models.

	Result variables					
	PES		PNE		PUS	
	β	SE	β	SE	β	SE
PRO (path c)	0.244**	0.064				
R^2		0.317				
PRO (path a)			-0.231**	0.051		
R^2				0.126		
PRO (path d)					0.229**	0.071
R^2						0.079
PNE (path b)	-0.104*	0.082				
PUS (path e)	0.213**	0.075				
PRO (path c')	0.244**	0.064				
R^2		0.222**				
Indirect effect	0.073**	(0.007–0.170)				

* $p < 0.05$, ** $p < 0.001$

SE standard error

Significant correlations were also found between PES and PRO and PUS (paths a, b, d, and e) and PNE. When the responses of the forest villagers to the expressions on the PRO scale were examined, they would positively affect their PUS included “lack of infrastructure and communication problems with the tourists.” Nevertheless, the PNE scale drew some negative perceptions for forest villagers such as “adversely affecting the lifestyle of the local people, environmental pollution concerns, and sometimes having conflicts.” The PRO-PUS-PNE-PES model indicated that forest villagers were quite attached to ecotourism components, even though there were some negative perceptions on their PRO and PES. For example, the PES scale suggested that “Rural people want to see more tourists in the region and they are satisfied with tourists coming to the region.” These expressions are particularly effective in understanding the PES level of the forest villagers.

According to the PNE model, “H₂: Perceived Revenue Opportunities are negatively associated with Perceived Negative Effects” is supported by the data ($\beta = 0.529$, $p < 0.001$). Hypothesis 2 predicted the negative direct effect of PRO on PNE. This can be explained as forest villagers’ PRO reduces their PNE. The following hypotheses were also supported according to the PNE and PUS models: “H₃: Perceived Negative Effects are negatively associated with Perceived Ecotourism Satisfaction,” “H₄: Perceived Insufficient Services play a mediating role on PES in the effect of Perceived Revenue Opportunities,” “H₅: Perceived Revenue Opportunities negatively affect Perceived Insufficient Services,” “H₆: Perceived Insufficient Services negatively affect Perceived Ecotourism Satisfaction,” “H₇: Perceived Insufficient Services negatively mediate the relationship between Perceived Revenue Opportunities and Perceived Ecotourism Satisfaction.” In other words, at 95% CI, the indirect effect estimation was 0.073 and 0.007–0.170 between PRO and PES. This effect was significant. Hypothesis 3 predicted a negative direct effect of PNE on PES. Hypothesis 4 estimated a positive indirect effect of PUS on PRO and PES. Hypothesis 4 estimated a negative indirect effect of PNE on PES. However, Hypothesis 7 estimated a negative indirect effect of PUS on PES. These indirect effects implied that forest villagers exhibited both negative and positive dimensions, even if their PES level was positive.

Table 3 presents the complete multidimensional model and the indirect effects of PUS and PNE. The indirect effects and mediation model of the original sample were computed as well as the estimated parameters of the β bootstrap samples. For the upper and lower bounds, 5000 samples from the original sample size were used to achieve improved results at a 95% confidence interval (CI).

The total effects between PRO and PES can be seen in Table 3 (path c). The relationship between PRO and PES showed that the PNE and PUS had a mediating effect that was statistically significant ($\beta = 0.073$, lower bound = 0.007, upper bound = 0.170). Significant relationships were also

found between PRO and PNE, PRO and PUS, PNE and PES, and PUS and PES (paths a, b, d, and e).

Discussion and conclusion

This research was aimed at understanding the attitudes and perceptions of forest villagers in the western Black Sea Region of Turkey concerning ecotourism activities in their region and at revealing the mediator effects in the relationship between PRO and PES. The first result of the study was related to the strong positive association by the forest villagers of PRO with PES and the second to their relatively higher association of PRO with PNE and PUS, negatively affecting unit PES. In general, the findings indicated that the PRO of the forest villagers exerted a positive direct effect, a negative indirect effect, and a positive total effect on PES.

The results of this study showed that active participation of forest villagers should be at the center of ecosystem-based functional planning approaches to be carried out within the scope of multiple-use forest management (Keleş et al. 2017; Birben and Gençay 2018). Gültekin et al. (2017) in their studies on this perspective emphasized that among the stakeholders, forest villagers should be associated with participatory approaches and “place attachment” in ecotourism planning. The findings of this study indicate that ecotourism activities that will ensure the development of forest villagers living in rural areas can be combined with the adaptation of agrotourism, hostel management, organic agricultural products and local food culture, and marketing of local handicraft products (Ciftcioglu 2021). Ecotourism can be developed by local governments via directing investments and leading activities in this regard (Okan et al. 2016; Davies et al. 2021). These opportunities can be used as a roadmap for implementing nature-based solutions in rural areas.

The education and income levels of the majority of rural societies such as forest villagers living in Turkey are low (Durkaya et al. 2017). The results of this study show that the forest villagers in the region do not have sufficient information about ecotourism activities due to lack of education. In this regard, basic entrepreneurship training related to environmental education, training courses for income-generating activities, and especially rural education studies can enable forest villagers to act more consciously toward ecotourism. In recent years, the concept of eco-entrepreneurship has come to the fore in facilitating the sustainability of ecotourism activities (Gültekin 2019). Developing ecotourism activities and putting them into operation with eco-entrepreneurship practices can be used as a tool to achieve more successful results and to reach the UNWTO poverty eradication target (Lee 2007). When forest ecosystem services and the well-being of villagers in both rural and forest areas are considered, they can be combined within several SDGs (SDG1, SDG15, SDG17).

Local people need to collaborate with the private sector and get the expand of the benefits to make certain the sustainable development and to increase the well-being of local communities (Angelica et al. 2010; Kiper et al. 2011). In this regard, forest villagers as local people can be supported by local governments, and ecotourism projects can be developed to carry out activities that will attract more tourists to the region. Promoting ecotourism activities to forest villagers allows them to take initiatives that will contribute to increasing their income. In this respect, the sustainable development of ecotourism can be used as a good practice tool in environmental sustainability (Gautam and Andersen 2016; Ciftcioglu 2021). Considering the forest villagers, who know the region very well, as field guides in ecotourism activities can be a good example of this initiative.

It is common for some conflicts to occur in the encounters between the rural community and the tourists visiting the region (Shasha et al. 2020). Socio-cultural factors are one of the most prominent reasons for conflicts between urban society and the rural people (Malik et al. 2016). Indeed, there is significant conflict in rural areas between local people and tourists because of the lack of knowledge and understanding between the stakeholders (Er et al. 2012). This study also demonstrated that despite some cultural differences and conflicts between these groups, according to the PES scale, there is still an average satisfaction level among forest villagers.

It is emphasized in the literature that employment, as one of the important components of sustainable development, is insufficient in rural areas where agricultural production activities are intense, and that there is a need for diversification of income sources in many different fields (Salman et al. 2021). In rural areas, there are barriers to economic growth, employment, and sustainable development, rural tourism, ecotourism, agricultural tourism, farm tourism, and so on. These can be overcome by supporting ecotourism opportunities. When studies on ecotourism and rural areas are examined, rural areas are seen to have positive effects on the physical and psychological health of urban individuals and to provide them with recreational and gastronomic opportunities, culture, etc. (Salem 2021). Global studies have been conducted on the importance of rural regions in terms of sustainable ecotourism and their roles in regional development. This study supports the importance of these issues with evidence through developed scales.

The sustainability agenda is about the effective and efficient use of ecosystem services in terms of improving the welfare of the rural population. Results of this study suggest that to ensure and enhance sustainable rural development, there need to be opportunities for the rural people. In order to ensure long-term sustainable ecotourism, forest villagers and all stakeholders need to establish and develop participatory cooperation (DasGupta and Shaw 2017; Gültekin et al. 2021). When the study area was evaluated, it was found necessary to develop rural tourism, nature-based tourism, and ecotourism

activities with a forest villager-oriented and nature conservation-centered approach. The results of this study show that the forest villagers do not adequately perceive the components and basic features of ecotourism beyond their interest in ecotourism activities. However, forest villagers, who are seen as the key to sustainable development, should be included in the planning and implementation processes (Zengin et al. 2018). In this context, focusing on ecotourism governance would be one of the initial steps. Ecotourism investments and practices at the local scale under the leadership of local governments should be shown as good practical examples in terms of educating the local people, capacity building, and environmental sustainability. In this way, the participation of the forest villagers in ecotourism activities as well as in educational training will be encouraged.

When conducting pioneering pilot studies, it is necessary to eliminate the negative views of the forest villagers by using good practices and public and private sector investments. Thus, the participation and support of all stakeholders should be ensured via improved communication skills. This research also can serve as a benchmark for further forest-rural-related studies.

The scales, structural models, and methods developed within the scope of the study enabled the perceptions and attitudes of rural people and the mediation effects to be determined. By applying them in different regions and conditions and adding other factors in terms of sustainable rural development, it would be possible to develop scales and policy implementations that could achieve better results.

Author contribution YSG performed conceptualization, the methodology and formal analysis, data collection, curation and the calculation of the model, and original draft preparation. The author read and approved the final manuscript.

Data availability The entire dataset was presented in the manuscript.

Declarations

Ethics approval and consent to participate This research study is an original work and has not been published elsewhere in any language. Informed consent was obtained from the participants.

Consent for publication Consent was obtained from the individuals who participated in this study.

Competing interests The author declares no competing interests.

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