VALUING THE RECREATION AREAS OF TURKEY: A TRAVEL COST ANALYSIS USING COUNT DATA REGRESSION MODELS

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ABSTRACT

This study aims to determine the economic value of 4 different recreational areas selected to represent nature and culture tourism in Turkey (Mount Nemrut and Soumela Monastery to represent culture tourism, Ayder Highland and Uzungöl Nature Park to represent nature tourism). The data were obtained from questionnaires carried out with 341 visitors who visited the aforementioned recreation areas in 2016. The Travel Cost Method (TCM) was used to create the demand function for visiting and recreational utilities projected by using Poisson and Negative Binomial (Negbin) models. The utility of the recreations per visit was determined as 500 TL. In the study, the consumer's surplus per visitor was calculated as 600 TL for Mount Nemrut, 750 TL for Soumela Monastery, 1100 TL for Ayder Highland and 700 TL for Uzungöl.

Keywords: Recreation, Rural Tourism, Surplus Value, Travel Cost Method

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INTRODUCTION

Nowadays, it is seen that societies are in a fast socially transformation, and thus, some new needs have emerged (Pak & Türker, 2004). One of the most important ones among the needs in question is recreation, referring to entertainment and leisure (Aksoy and Bilgiç, 2019). People who have become bored with urban life have searched different spaces or recreational areas for reasons such as resting and fulfilling their hobbies. As a result of this, in recent years, significant increases have been experienced in culture and nature tourism. With this increase in demand, the humankind, who considered resources to be unlimited, has led to deterioration of parks, historical texture and cultural areas that are open to public (Iamtrakul, Teknomo, & Hokaro, 2005).

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The concept of "Sustainable Development," which came into the agenda of the United Nations in 1987 with the idea to leave a livable world for future generations in the report of the World Commission on Environment and Development, also known as the Brundtland Report, is based on the economic, social and ecological development of the world (WCED, 1987). In line with sustainability, it is possible to leave a livable world for future generations by fulfilling social responsibilities and not irresponsibly consuming natural resources and achieve economic development while doing so. Nature and natural resources are the guarantee of sustainable human life. National parks are among the most significant and more rooted constructs as methods of protecting nature. Protection of natural resources has importance in achievement of continuation in utilization of nature by people and its transfer to new generations.

In terms of helping governments make decisions and look from a broader perspective for managing natural and cultural resources, it is needed to understand the value of these resources. The economic value of non-marketed resources may be developed by using two different approaches as the stated preference and revealed preference methods. By applying the contingent valuation or choice model, In the first approach, the visitors are asked to provide a sum that are willing to pay for the resource. Revealed preference methods are based on observed behaviors and indirectly obtained data. These two approaches usually provide different results (Torres-Ortega, Pérez-álvarez, Díaz-Simal, de Luis-Ruiz, & Piña-García, 2018). There are a few studies in the literature conducted to find an explanatory relationship between the two methods (Armbrecht, 2014; Herath and Kennedy, 2004).

The travel cost method is a method of valuation of non-marketed goods or services from the travel consumption behaviors of individuals. While this method was mentioned for the first time by Hotelling (1949), it was developed more and put into practice by Trice and Wood (1958) and Clawson and Knetsch (1966). The travel cost method, in todays, which is highly prevalently applied to valuing the regarding forests, wetlands, scenic rivers, canyons, beaches, coral reefs and historical sites (e.g., Bertram and Larondelle, 2017; De Frutos et al., 2019; Dong et al., 2018; Filippini et al., 2018; Lee et al., 2018; Marini Govigli et al., 2019; Mayer and Woltering, 2018; Molina et al., 2019; Othman and Jafari, 2019; Pascoe, 2019; Torres-Ortega et al., 2018; Tourkolias et al., 2015; Yuan and Wang, 2018; Zandi et al., 2018), is a revealed preference approach that is based on actual observation data. In comparison to the stated preference approach based on a virtual market, the travel cost method has more reliability (Loomis, Creel, & Park, 1991)

This study aimed to estimate the economic valuing of Nemrut Mountain National Park (in the list of UNESCO World Heritage), Soumela Monastery, Ayder Tableland and Uzungöl

Nature Park, where are the most significant touristic places representing nature and cultural tourism in Turkey. In the study, regarding the four different tourism and recreation areas following titles were investigated.

(1) Calculating the consumer's utility, (2) Determining the factors that affected the visits of visitors and (3) Comparing the number of visits and visitors' income levels by the regions.

MATERIAL AND METHOD

Data

The data used in the study were obtained from the 341 domestic and international tourists who visited the Uzungöl Nature Park, Nemrut Mountain National Park, Soumela Monastery and Ayder Tableland using well designed questionnaires. The distribution of the total number of questionnaires among the recreational areas was 101 for the Uzungöl Nature Park, 100 for the Mount Nemrut National Park, 80 for the Soumela Monastery and 60 for the Ayder Tableland. The questionnaire was conducted in June and August 2016 when the visitors were highly concentrated on the places.

Method

After collecting detailed information on the characteristics of the study areas and visitors, a literature review was conducted on the method to be implemented in the study. In determination of the travel cost values of the Uzungöl Nature Park, Nemrut Mountain National Park, Soumela Monastery and Ayder Tableland, the independent and dependent variables were determined based on the common characteristics of the areas.

Travel cost method

The theoretical starting point in estimating recreational demand is the Travel Cost Method (TCM). The technique is one of several revealed preference methods applied to the valuation of non-marketed goods and services (Braden and Kolstad, 1991; Freeman, 1992; Garrod and Willis, 1999). Examples of the application of the method to value national parks include Beal (1998) and Liston-Heyes and Heyes (1999) . The TCM method relies on the assumption that, although access to recreational site has a minimal price or no explicit price, individual's travel costs, including transportation, accommodation, and lost wages, can be used as surrogate prices to approximate the nonexistent prices for their recreational experience. The basic premise is that visitors perceive and respond to changes in travel costs to the site in the same way they would respond to changes in an entry fee, so the number of trips to a recreation site should decrease with increases in distance travelled and other factors increasing the total travel cost. Exploiting this postulated relationship permits the researcher to estimate a true demand

relationship. Socioeconomic characteristics of the individuals and information concerning substitute sites and environmental quality indicators can also be included.

Weak separability of recreation demand from non-recreation consumption and weak comple mentarit (Mäler, 2013) of the marketed goods and services required to get to and to enjoy the site make it possible to estimate a demand curve for individual sites and, from it, a measure of the consumer surplus derived from the place. However, it is clear that the TCM measures only user values of the site. The TCM cannot calculate any type of non-use value (Krutilla, 1967), such as intrinsic value, existence value, option value, or bequest value. The estimates of full-economic value obtained from TCM studies will therefore err on the conservative side and can only be considered as a lower-bound measure of the full benefit of recreational sites.

The concept of TCM is based on the idea that the tourism-related cost of travelling to a tourism destination reflects the economic value of that destination. In general, according to the law of demand, if we assume that the recreation utility of a consumer is affected by the number of visits (q), and if the per person travel cost is 'c', and the combination of the prices of other goods and services is 'r' (composite commodity price), then, under limited personal income, the problem of maximizing the consumer utility (I) would be as follows.

$$\text{Max } U(r, q)$$
$$\text{S.t.} \quad cq + r = I \qquad \text{(Eq. 1)}$$

From the utility maximization problem in Eq. 1, the tourism demand function of the consumer for the tourism destination, q*, may be derived as follows.

$$q^* = q^*(c, I) \qquad \text{(Eq. 2)}$$

For tourism demand, in addition to travel cost, the recreation areas included in the study and the socioeconomic characteristics of visitors as a dummy variable were also considered as explanatory variables. Accordingly, the regression model becomes as follows.

$$q = f(x_1, x_2, \dots, x_n, c, I, A) \qquad \text{(Eq. 3)}$$

On the formula, $x_1, x_2, x_3, \dots, x_n$ are the personal socioeconomic characteristics (age, gender, education status, etc.), c is the travel cost and I is the personal income. A is a dummy variable and represents the recreation areas whose economic values are to be estimated in the study (Mount Nemrut National Park, Soumela Monastery, Uzungöl Nature Park and Ayder Tableland).

$$CS = \int_{c_l}^{c_h} f(x_1, x_2, x_3, \dots x_n, c, I, A)dc \qquad \text{(Eq. 4)}$$

In Eq. 4, $f(x_1, x_2, x_3, \ldots x_n, c, I)$ is the tourism demand function, c_h is the highest travel cost among all samples, and c_l is the lowest travel cost among all samples.

The Empirical Model for Tourism Demand

The general approach to model demand for recreation is the usage of count data models (De Frutos et al., 2019; Mulwa et al., 2018; Nakatani and Sato, 2010; Othman and Jafari, 2019; Pulido-Fernandez et al., 2016; Shrestha et al., 2002; Wang et al., 2009; Yuan and Wang, 2018). OLS estimators are less effective in the existence of the count outcome variable (Hellerstein & Mendelsohn, 1993). The independent variable q in Eq. 3 is a positive integer a large part of which is constituted by the data of small observations of the variable. Count data models have been determined to be more suitable for such data (Creel & Loomis, 1990; Herriges & Kling, 1999).

For most travel cost models, the count data represent a Poisson regression. The probability of observing individuals who spend q hours in a month or are willing to take part in travel by q is expressed as follows:

$$\text{prob}\,(q) = \frac{\lfloor \exp(-\lambda)\lambda^{q} \rfloor}{q!} \qquad \text{(Eq. 5)}$$

Here, $\lambda\ (= \exp(X_i\beta))$ represents the estimated value of the independent variable. It is a model of the variables in the demand model specified in Eq. 3. As $\lambda>0$, it normally takes a log-linear form.

$$\ln(\lambda) = \beta_1 x_1 + \beta_2 x_2 + \cdots \beta_n x_n + \beta_c c + \beta_I I + \beta_A A \qquad \text{(Eq. 6)}$$

The parameters are estimated by using the maximum likelihood estimator.

The Poisson model assumes that the mean of the distribution is equal to its variance. However, in practice, this assumption is not usually met, and the data show a larger dispersion. In this case, one alternative is to use negative binomial (NB) distributions. NB ads an error term based on the hypothesis of the equality of the mean and the variance. This way, it allows consideration of unobservable systematic differences (Haab & McConnell, 2002). If $\exp(\varepsilon_i)$ gamma (Γ) follows, then, the combined count data production operation follows an NB distribution (Cameron & Trivedi, 2013). The NB probability distribution is expressed as follows:

$$Pr = [T = q] = \frac{\Gamma(\alpha^{-1} + q_i)}{\Gamma(\alpha^{-1}) + \Gamma(q_i + 1)} \times \left(\frac{1}{1 + \alpha\lambda}\right)^{\alpha-1} \times \left(\frac{\alpha\lambda}{1 + \alpha\lambda}\right)^{q_i} \qquad \text{(Eq. 7)}$$

In the model above, if $\alpha=0$, the model is reduced to Poisson.

Other issues are truncation and endogenous stratification which are related to obtaining data only from those who visit the area (Englin & Shonkwiler, 1995). Truncated refers to the

absence of people who visit the area (site) 0 times. Endogenous stratification refers to that the probability of those who visit the area (site) frequently to be included in the sample is higher than the probability of those who visit the site less frequently (Czajkowski et al., 2015; Englin & Shonkwiler, 1995; Pascoe, 2019).

A Poisson model may be corrected for truncation and endogenous stratification with the same probability mass function shown in Eq. 5. This correction may be achieved by replacing the response variable q in Eq. 5 with q-1. Additionally, the NB model may be corrected for truncation and endogenous stratification by modifying Eq. 5 as follows.

$$Pr = [T = q] = \frac{\Gamma(\alpha^{-1} + q_i)}{\Gamma(\alpha^{-1}) + \Gamma(q_i + 1)} \times {\alpha_i}^{q_i} {\lambda_i}^{q_i} \times (1 + \alpha_i \lambda_i)^{q_i} \qquad \text{(Eq. 8)}$$

When the demand for recreation areas is estimated using count data models (Eq. 6), the consumer's surplus for each consumer may be reduced to the following formula:

$$CS_n = \frac{\lambda_n}{\beta_c} \qquad \text{(Eq. 9)}$$

The n index in the formula refers to the visitors. The per person annual consumer's surplus for each of the recreation areas may be obtained by multiplying the annual number of visits by the per visit consumer's surplus.

RESULTS AND DISCUSSION

Profile of the Respondents

Based on the data obtained from the visitors, the vast majority of the visitors of all four recreational areas examined in the study consisted of men (68.0%). Among the visitors, 85.2% for the Uzungöl Nature Park, 65.3% for Mount Nemrut, 62.3% for the Ayder tableland and 53.8% for the Soumela Monastery were male. 66% of the visitors consisted of young people in the age group of 20-40. 56% of the visitors were married, 44% were single, while these ratios varied based on the recreational area. The visitors of the recreational areas had degrees for primary education by 13.8%, high school by 24.6% and university or higher by 61.6%. While a large majority of the visitors were civil servants, the rate of retired individuals who were expected to visit more was very low. The visitors mostly arrived with their families (58.7%), whereas the proportion of those coming with friends was lower. The ratio of those coming from regular cities (73.0%) was much higher than those coming from metropolitan cities. The visiting rate of the group with a monthly income level of up to 4000 TL was higher, while the visiting rate decreased among those with a monthly income level of higher than 4000 TL. As income increased, visitors preferred historical and natural recreation areas less frequently.

Table 1. Demographic distribution of respondents (%)

Demographic characteristics	Category	Nemrut Mountain	Sumela Monastery	Ayder Tableland	Uzungöl Nature Park	General
Gender	Male	65.0	53.8	62.3	85.2	68.0
	Female	35.0	46.2	37.7	14.8	32.0
Age	<20	1.0	4.9	8.1	0.0	2.9
	20-30	21.0	39.5	46.8	22.8	30.8
	31-40	41.0	33.3	19.3	42.6	35.2
	41-50	23.0	19.7	16.1	15.8	19.1
	>50	14.0	2.6	9.7	18.8	12.0
Status	Married	46.0	58.5	38.9	73.8	56.1
	Single	54.0	41.5	61.1	26.2	43.9
Education	Primary school	5.9	18.5	14.6	17.8	13.8
	High school	21.8	34.6	17.7	23.8	24.6
	Undergraduate and above	72.3	46.9	67.7	58.4	61.6
Occupation	Public employee	46.0	41,1	33.3	34.6	39.1
	Self-employed	14.0	10.0	11.7	28.7	15.1
	Retired	3.0	3.1	8.3	8.9	5.3
	Student	5.0	11.2	20.0	5.9	11.1
	Other	32.0	34.6	60.0	21.9	29.4
Visitation with	With family	49.0	62.4	68.7	60.2	58.7
	With friends	51.0	37.6	31.3	39.8	41.3
Place of residence	Bigcities	23.0	23.6	24.6	34.9	27.0
	City	77.0	76.4	75.4	65.1	73.0
Personal monthly income (TL)*	≤2000	22.8	35.8	17.7	28.7	26.7
	2001-4000	59.7	45.7	46.8	41.6	48.4
	4001-10000	12.7	12.9	19.4	8.9	13.2
	10001	4.8	5.6	16.1	20.8	11.7

*According to the data of the Central Bank of the Republic of Turkey, 1 dollar was 3.02 TL in 2016.

Tourists' behaviors regarding recreation areas and travel cost

Table 2 shows the behaviors of visitors regarding the recreational areas and travel costs. Accordingly, most of the visitors (72.7%) were visiting these areas for the first time. This ratio was higher for the Uzungöl Nature Park and Mount Nemrut. The ratio of those visiting for the second time was determined as 17.6%. Based on travel time, it was determined that most visitors (43.7%) were willing to travel for more than 8 hours to see these recreation areas. These were followed by those who were willing to travel for 2-4 hours (18.8%). If we assume that the visitors with travel times of 4 hours or shorter were coming from residential areas that are close by, it may be stated that the majority of those visiting Mount Nemrut (79.0%) were coming from far away cities. The ratios of those coming from far away cities were 63.4% for the Ayder Tableland, 43.6% for the Uzungöl Nature Park and 40.1% for the Soumela Monastery. This shows that, while the majority of those visiting Mount Nemrut and the Ayder Tableland were coming from afar, those visiting the Soumela Monastery and Uzungöl Nature Park were coming mostly from closer places. While 88.4% of the visitors stayed at the recreation area for a maximum of 7 hours, 11.6% stayed for more than 24 hours. 38.7% of those who visited the

Ayder Tableland and 9.1% of those who visited the Uzungöl Nature Park stayed there for more than 24 hours. The reason for those visiting these two recreation areas to stay for more than 24 hours is the presence of accommodation on the sites. In general, the transportation cost of approximately 50% of the visitors were under 200 TL, whereas that for 30% was in the range of 201-300 TL. Approximately 20% had a transportation cost of higher than 301 TL. The mean transportation cost per visit was determined as 187.8 TL. The accommodation and food costs of 76% of the visitors were 300 TL or lower. It was seen that the visitors of the Ayder Tableland and Uzungöl Nature Park made more expenses in comparison to the visitors of the other recreation areas. The most significant reason for this was that the length of stay for these areas were longer than those for the other areas. The mean accommodation and food cost per visit was calculated as 164.6 TL. The mean value of the other expenses made per visit by the visitors other than the opportunity cost of the time spent during their travel and transportation, accommodation and food costs was found as 107.2 TL. This value was higher for the visitors of the Ayder Tableland and Uzungöl Nature Park.

Table 2. Travel cost and behaviors of the tourists (%) by the recreational area

	Category	Nemrut Mountain	Sumela Monastery	Ayder tableland	Uzungöl Nature Park	Overall
Number of visits (frequency)	1	78.2	67.9	58.1	82.0	72.7
	2	21.8	19.7	19.3	9.9	17.6
	3	0.0	9.9	6.4	3.0	4.4
	4	0.0	0.0	8.1	2.0	2.1
	≥5	0.0	2.5	8.1	3.1	3.2
Travel time (h)	≤2	4.0	13.7	16.6	34.6	17.6
	2-4	7.0	41.2	20.0	10.9	18.8
	4-6	30.0	5.0	10.0	10.9	15.2
	6-8	11.0	0.0	8.3	2.9	4.7
	≥8	48.0	40.1	45.1	40.7	43.7
Duration of stay (h)	≤3	47.3	76.6	20.1	39.6	47.1
	4-7	48.6	19.7	41.2	51.3	41.3
	≥24	4.1	3.7	38.7	9.1	11.6
Transportation expenses (TL/ trip)	≤100	2.0	10.0	31.7	20.7	14.7
	101-200	40.0	46.2	20.0	30.7	35.2
	201-300	35.0	31.2	23.3	29.7	29.9
	301-400	14.0	10.0	6.7	6.9	9.7
	≥401	9.0	2.6	18.3	11.9	10.5
Accommodation and food expenses (TL/trip)	≤100	28.0	36.2	13.3	17.8	24.3
	101-200	31.0	30.0	15.0	23.7	25.8
	201-300	27.0	21.3	20.0	31.7	25.8
	≥301	14.0	12.5	51.7	26.8	24.1
Other expenses (TL/trip)	≤100	47.0	42.5	250	23.8	35.2
	101-200	35.0	35.0	60.0	29.7	35.8
	201-300	20.0	20.0	8.3	18.8	16.7
	≥301	8.0	2.5	6.7	27.7	12.3

Among the visitors, 30.9% were satisfied with their visit, 34.7% were neutral, and 34.4% were dissatisfied. Those who were neutral or dissatisfied stated that the natural beauties of these important recreation areas had been disrupted by visitors and argued that the precautions against this negative change induced by people and the ecosystem services that were provided were insufficient. Those who were satisfied stated that the natural and historical recreation areas were sufficiently preserved, and they were satisfied with the services that were provided. While the majority of the visitors to the Ayder Tableland and Uzungöl Nature Park which are nature-based recreation areas stated that they were dissatisfied (respectively 51.6% and 40.6%), the majority of those that visited Mount Nemrut were neutral (52.5%), and the majority of those that visited the Soumela Monastery was satisfied (53.8%) by the ecosystem services. To the question asked to the visitors regarding whether or not they would come back, 86.5% said yes, 10.0% said no, and 2.6% were undecided. While 90.9% of the visitors stated that they would recommend the recreation areas to others, 6.7% said they would not, and 2.4% were undecided.

Table 3. Visitors' contentment level and requests to visit again

		Nemrut Mountain	Sumela Monastery	Ayder Tableland	Uzungöl Nature Park	Overall
Satisfaction level	Very satisfied	3.0	12.6	10.1	5.9	12.3
	Satisfied	16.8	41.2	15.0	19.8	18.6
	Neutral	52.5	28.7	23.3	33.7	34.7
	Dissatisfied	21.8	15.0	23.3	22.8	20.8
	Very dissatisfied	5.9	2.5	28.3	17.8	13.6
Willingness to revisit	Very high	48.0	52.5	53.3	57.4	52.8
	High	22.0	42.5	41.7	33.7	33.7
	Neutral	2.0	2.5	3.3	3.0	2.6
	Low	28.0	2.5	1.7	5.9	10.9
	Very low	0.0	0.0	0.0	0.0	0.0
Willingness to recommend to others	Very high	42.0	61.3	61.7	51.5	52.8
	High	35.0	35.0	33.3	46.5	38.1
	Neutral	3.0	2.5	3.3	1.0	2.4
	Low	20.0	1.2	1.67	1.0	6.7
	Very low	0.0	0.0	0.0	0.0	0.0

Determination of the economic values of the recreation areas

In calculation of the consumer's surplus, the Poisson Regression Model was used in compliance with the Poisson distribution. The function was determined as follows.

Individual annual number of visits = *f* (GENDER, MSTATUS, SNDJOB, HOMEOWNR, SSECRTY, OTO, BIGCITY, AN, AS, AU, AA, INCOME, AGE, EDUCNYRS, NATRINDX, INFOINDX)

In the function, while the individual annual number of visits was taken as the dependent variable, the independent variables consisted of two groups as the socioeconomic information of the visitors and travel-related information. The independent variables that were used in the model were: gender, marital status, second job, home ownership, social security, car ownership, city of habitation, place of visit, income, age, education level, nature index, information index and travel cost. The per person travel cost was taken as the travel cost, and it was obtained by dividing the total travel cost variable by the number of individuals in the group (*Table 4*). The total travel cost was calculated as the sum of transportation cost, consumption costs, accommodation cost and the gain given up by arriving at the place of visit if any. The value of time was not included as a certain ratio of price. As a large part of the visitors that were surveyed were students and civil servants, they responded to this question as that they had no gain. This is why the responses to this question were not included in the costs.

Table 4. Descriptive statistics for variables in the model

Variables		Mean	Std. Dev	VIF
Dependent variable				
Y	Number of visits per person annual	1.526	1.356	
Indipendent variables				
Gen	Gender (female:0, male:1)	0.672	0.470	1.090
Msts	Marital status (single: 0, married:1)	0.544	0.499	1.585
Scndjob	Second job (if not:0, if he has second job:1)	0.115	0.320	1.092
Homeownr	Home ownership (if not:0, if he is home owner:1)	0.641	0.481	1.103
Ssecrty	Social security (if not: 0, if he has social security:1)	0.889	0.315	1.231
Oto	Owning a car (if not:0, if he has a car:1)	0.589	0.493	1.148

Bıgcıty	Coming from Istanbul (if not:0, if so:1)	0.230	0.422	1.115
AN	Nemrut:1, others:0	0.289	0.454	1.990
AS	Soumela:1, others:0	0.258	0.438	1.581
AA	Ayder:1, otehrs:0	0.160	0.368	1.424
AU	Uzungöl:1, others:0	0.293	0.456	-
Income*	Income (<500:1, 501-1000:2, …, 4501-5000:9, 5001-10000:10, 10000-20000:11 and 20001<:12	6.031	2.883	1.388
Age	Visitors' age	35.815	10.770	1.431
Educnyrs	Education of visitors (year)	13.610	4.084	1.013
Natrındx	Nature index (Vegetation, sunrise and sinking, geological formations, historical and archaeological values) least 5, most 25 points	17.091	4.228	0.993
Infoındx	Inform index (family or friend advice, tourism agencies, newspaper magazine TV etc., Internet, Promotional brochures and coincidental) least 6, most 30 points	15.840	5.240	1.414
Travel Cost per trip (TL)*	The per trip cost includes distance and opportunity cost of time for each respondent. Time cost is round trip travel time (in hours) multiplied by a third of hourly wage rate where the wage rate was equal to daily income over daily working hours (8 h). The distance cost was calculated by multiplying the round-trip distance by variable cost component per kilometer. The cost per kilometer rates (0.7 for cars/vans) was adopted based on the rates by the Highway Planning Unit, Ministry of Works, Turkey. Discounts of 60% and 90% were accorded to the use of motorcycles and bicycles, respectively.	459.554	290.313	1.349

*According to the data of the Central Bank of the Republic of Turkey, 1 dollar was 3.02 TL in 2016.

The data that were used in the study contained endogenous stratification and truncation. This is why endogenous Poisson and endogenous negative binomial models were used to eliminate endogenous stratification and truncation. Endogenous negbin is an alternative model for the endogenous Poisson model. It is a very frequently applied model for samples of visits in groups and recreation area research (Englin & Shonkwiler, 1995; Shaw, 1987). The results in the study on the endogenous Poisson and endogenous negbin models are shown in Table 5.

Table 5. Estimation of the demand model

Variable	Endogenous Poisson		Endogenous negbin	
	Coefficient	t-score	Coefficient	t-score
Constant	-0.244	-0.36	-3.603***	-3.79
GENDER	0.310	1.55	0.299	1.11
MSTATUS	-0.077	-0.32	-0.042	-0.13
SNDJOB	0.869***	3.38	1.024**	2.85
HOMEOWNR	0.702**	3.02	0.635*	2.22
SSECRTY	0.557	1.42	0.417	0.87
OTO	0.453	2.40	0.333	1.28
BIGCITY	-1.827***	-3.93	-1.810***	-3.60
AN	-0.193	-0.59	-0.212	-0.52
AS	0.572*	2.01	0.628	1.72
AA	0.704**	2.87	0.775*	2.14
INCOME	0.025	0.77	-0.006	-0.13
AGE	0.013	1.25	0.016	1.08
EDUCNYRS	-0.076***	-4.08	-0.065*	-2.24
NATRINDX	-0.012	-0.77	0.002	0.08
INFOINDX	-0.056**	-2.96	-0.037	-1.48
Travel Cost	-0.002***	-4.92	-0.002**	-3.11
a			16.035***	7.86
Log likelihood	-242.293		-227.875	

*,**,***, statistically significant at level of 0.10, 0.05 and 0.01, respectively.

According to the endogenous Poisson model, the variation that occurs in the dependent variable originates from the model. However, according to the endogenous negbin model developed as an alternative to this model, the hypothesis is that this variation originates from the independent variables. Looking at the model results, it is understood that this hypothesis holds. The finding that the marital status, home ownership, education, age, coming from Istanbul, nature index, cost and constant variables were statistically more significant in the endogenous negbin model in comparison to the results of the endogenous Poisson model showed that the endogenous negbin model was a more suitable model.

In both models, the sign of the estimator of the travel cost independent variable was negative and statistically significant as expected. In the endogenous Poisson model, the visitor's possession of a second job and a home affected their annual number of visits positively. Coming

from Istanbul and a high education level affected the number of visits negatively on the significance level of 1%. The visitors visited the Soumela Monastery and Ayder Highland more in comparison to Uzungöl.

In the endogenous negbin model, the visitor's possession of a second job and a home affected the annual number of visits positively. Coming from Istanbul and travel cost affected the number of visits negatively on the significance level of 1%. Studies in the same region found similar negative significant relationships between travel cost and the independent variable of annual frequency of visits according to the endogenous Poisson model (Karakuş & Aksoy, 2016; Külekçi & Dönmez, 2014).

Considering the marginal effect values obtained for the annual number of visits with the Poisson model results, a 1-TL increase in the per person travel cost led to a reduction of 0.001 in the number of visits. The visitor's possession of a second job increased their number of visits to the studied areas by 0.46. The visitors coming from Istanbul had reduced number of visits in comparison to those coming from other cities by 0.96 (Table 6). Again, considering the same table, visiting Uzungöl increased visiting the Ayder Highland by 0.37 and the Soumela Monastery by 0.30.

Table 6. Marginal effects of the variables

Variable	Endogenous Poisson		Endogenous negbin	
	Coefficient	t-score	Coefficient	t-score
GENDER	0.163	1.65	0.153	0.98
MSTATUS	-0.040	0.33	-0.021	0.11
SNDJOB	0.457***	3.23	0.523**	2.24
HOMEOWNR	0.370***	3.51	0.324**	2.02
SSECRTY	0.293	1.41	0.213	0.74
OTO	0.238***	2.62	0.170	1.04
BIGCITY	-0.961***	3.41	-0.924***	2.75
AN	-0.102	0.55	-0.108	0.39
AS	0.301**	2.30	0.321	1.54
AA	0.371***	3.18	0.396*	1.84
INCOME	0.013	1.08	-0.003	0.12
AGE	0.007	1.32	0.008	0.83
EDUCNYRS	-0.040***	3.37	-0.033	1.58
NATRINDX	-0.006	0.87	0.001	0.06
INFOINDX	-0.030***	3.04	-0.019	1.22
COST	-0.001***	4.98	-0.001**	2.58

*,**,***, statistically significant at level of 0.10, 0.05 and 0.01, respectively

In the study, the consumer's surplus was calculated as follows by taking the integral of the recreation demand function.

$$\int \lambda_i d_{ML} = -\frac{\lambda_i}{\beta_{ML}}$$

$$\text{CS}_{\text{per visit}} = \int_{ML}^{\infty} \lambda_i d_{ML} = -\frac{\lambda_i}{\beta_{ML}}$$

For each visit, the consumer's surplus is calculated with the formula $-1/\beta_1$. β_1 is the estimator of the COST variable in the demand function. According to the endogenous Poisson model estimation results given in Table 5, the value of the β_1 parameter is 0.002 (in the hypothesis testing using the Delta method, the t calculation value found for the COST variable was 4.92, and it was found significant on the level of 1%). Substituting this value into the formula,

$$\text{CS}_{\text{per visit}} = \int_{ML}^{\infty} \lambda_i d_{ML} = -\frac{\lambda_i}{\beta_{ML}} = 1/0.002 = 500 \text{ TL.}$$

When the consumer's surplus is calculated based on the endogenous Poisson model estimation results, the value will not change as the value of the β_1 parameter is 0.002.

In Table 7, the annual consumer's surplus for Mount Nemrut was calculated as (500x1.2) 600 TL. By multiplication of this value with the annual average number of visitors, the recreational and tourism-based utilization value of Mount Nemrut per year was calculated as 19 388 400 TL/year. In the comparison of the areas in the same table, it was seen that Uzungöl and Ayder received the highest numbers of visitors. The highest per person annual number of visits was also in the Ayder Tableland as 2.2. The Ayder Tableland, which has an increased number of visitors every year, is one of the areas with the highest number of visitors among the studied areas. Jang et al. (2004) stated that a sustainable tourism policy needs to consider the daily expenditure per tourist as a marketing goal rather than trying to obtain the highest number of tourists. In recent years, activities appealing to tourists have been increased around the Ayder Tablelandand Uzungöl, and this has ensured that visitors stay longer in these areas and spend more. Tourists visiting the Mount Nemrut National Park, which is one of the rarest regions word seeing in Turkey, see the natural beauties and leave. Because there are no activities for tourists to spend quality time and no accommodation opportunities, the area is constantly losing its appeal.

Table 7. The annual recreation and tourism-based utilization value of the regions

Indicators	Nemrut Mountain	Sumela Monastery	Ayder Tableland	Uzungöl Nature Park	Overall
1.Consumer surplass per visitor (TL)	500	500	500	500	500
3.Number of annual visits per person	1.2	1.5	2.2	1.4	1.5
4.Annual consumer rant (1x2)	600	750	1100	700	750
5.Average number of visitors per year (1000 person)	32.3	500.0	690.3	697.1	1919.8
6. The annual recreation and tourism-based utilization value of the regions (1000000 TL/Year) (4x5)	19.4	375.0	759.4	488.0	1440.0

CONCLUSION

With this study, it was determined that there is a relationship between the expenditures of tourists visiting rural tourism areas at different locations of Turkey and socioeconomic factors such as age, education, income, marital status or home ownership. The study shows that some areas among tourism destinations have become specialized in terms of nature and culture tourism, and these areas host more tourists.

In the study, it was found that more tourists visited the Ayder Tableland and Uzungöl Nature Park, and the number of tourists visiting the Soumela Monastery was also high due to its presence in the same region. It was seen that the number of tourists visiting the Mount Nemrut National Park was very low, and according to the data of the Ministry of Tourism, the number of tourists visiting the area is constantly decreasing.

The responses of the visitors on not only visiting these recreation areas again but also recommending these to other people showed that the natural beauty of these recreation areas is word seeing, but the visitors were not satisfied with the preservation of these areas and ecosystem services. It was stated that, despite interventions on especially the natural recreation areas by people who visit these places and their negative effects, the preservation of these areas and ecosystem services were insufficient.

According to the model results, the head of the household's possession of a second job, home and automobile affects visits to the areas positively. Moreover, habitation of the person in Istanbul, higher travel cost and increased education level affect visits negatively. The status of visiting the Uzungöl Nature Park increases visits to the Ayder Tableland and Soumela Monastery, while decreasing visits to the Mount Nemrut National Park.

The study also has significance in terms of discussing four different areas simultaneously and shedding light on the practices in similar areas in Turkey. It is believed that determination

of the value of utilization of four areas for recreation and tourism annually will be guiding for policymakers and institutions and organizations working on this issue in terms of determining the amounts of investments to be made to these areas.

Increasing the number of similar studies in Turkey will contribute to achievement of rational and sustainable usages that will increase the value of these area by determining the usage values of natural resources. With the condition that the share to be allocated from the budget is determined based on the usage value of these areas, and this allocation is used to preserve the historical and cultural texture in these areas, it will be possible to use these areas to repair existing buildings, improve facilities and preserve and increase the diversity of fauna and flora.

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