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The role of environmental awareness and perceived local government participation in the sustainable use of forest resources: A study on forest villages in Akdağmadeni district

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ABSTRACT: This study aims to evaluate the sustainable use of forest resources in forest villages within the framework of the environmental awareness level of the public and local government participation. Forest villages hold a critical position in terms of natural resource management because a significant portion of their livelihoods come from forest products. In this context, the research examines the awareness level of the villagers regarding the forest ecosystem, their sustainable use behaviors, and their perception of participation in the decision-making processes of local governments. The research is designed based on a quantitative method, and a structured questionnaire is used as a data collection tool. Based on the data obtained, the study aims to reveal the relationships between environmental awareness, the way forest resources are utilized, and trust in local governments through statistical analyses. It is expected that the study will contribute to the development of sustainable forest management policies, offer suggestions for strengthening local participation mechanisms, and provide a scientific basis for strategies to increase the level of environmental awareness in forest villages.

Keywords: Forest villages, sustainable forest management, environmental awareness, local government participation, forest resources.

Orman kaynaklarının sürdürülebilir kullanımında çevresel bilinç düzeyi ve yerel yönetim katılımı algısının rolü: Akdağmadeni ilçesi orman köyleri üzerine bir araştırma

ÖZET: Bu çalışma, orman köylerinde orman kaynaklarının sürdürülebilir kullanımını, halkın çevresel bilinç düzeyi, yerel yönetim katılımı ve davranışsal eğilimler çerçevesinde değerlendirmeyi amaçlamaktadır. Orman köyleri, geçim kaynaklarının önemli bir bölümünü orman ürünlerinden sağlaması nedeniyle doğal kaynak yönetimi açısından kritik bir konuma sahiptir. Bu bağlamda araştırmada, köy halkının orman ekosistemine ilişkin farkındalık düzeyi, sürdürülebilir kullanım davranışları ve yerel yönetimlerin karar alma süreçlerine katılım algısı incelenmektedir. Araştırma nicel yöntem temelinde tasarlanmış olup, veri toplama aracı olarak yapılandırılmış anket formu kullanılmaktadır. Elde edilen veriler doğrultusunda çevresel bilinç, orman kaynaklarını kullanım biçimi ve yerel yönetimlere duyulan güven arasındaki ilişkilerin istatistiksel analizlerle ortaya konulması hedeflenmektedir. Çalışmanın, sürdürülebilir orman yönetimi politikalarının geliştirilmesine katkı sağlaması, yerel katılım mekanizmalarının güçlendirilmesine yönelik öneriler sunması ve orman köylerinde çevresel bilinç düzeyinin artırılmasına yönelik stratejilere bilimsel zemin oluşturması beklenmektedir.

Anahtar kelimeler: Orman köyleri, sürdürülebilir orman yönetimi, çevresel bilinç, yerel yönetim katılımı, orman kaynakları.

INTRODUCTION

Forest ecosystems are natural systems that perform many critical ecological functions, such as the conservation of biodiversity, the regulation of the carbon cycle, and the sustainable management of water resources. Furthermore, forests play a significant role in the sustaining local livelihoods, providing important economic and social benefits, especially for communities living in rural areas. Many rural communities worldwide are directly dependent on forest resources for firewood, non-timber forest products, and other ecosystem services. Therefore, the sustainable management of forests is considered not only an environmental necessity but also a critical issue for rural development (Bowler et al., 2012).

The sustainable forest management approach refers to a management philosophy that aims to protect the ecological, economic, and social functions of forests in a balanced way (Akyol & Tolunay, 2014). Within this approach, the conservation of forest resources, the efficient use of natural resources, and the improvement of the well-being of local populations are considered together. Today, in many countries, sustainable forestry policies require that forest resources be evaluated not only from a production perspective but also in terms of ecosystem services. Indeed, studies examining the impacts of forest management practices on sustainability show that community-based management approaches can make significant contributions to the protection of ecosystems (Sandim et al., 2024).

The participation of local communities in natural resource management is considered a crucial element for sustainability. A participatory management approach envisages the consideration of the knowledgeand experience of local people in the management of natural resources and including them in decision-making processes. Various studies have shown that community-based forest management practices, in particular, can provide significant benefits in terms of both environmental protection and local development (Matsvange et al., 2016). In line with

this approach, a high level of environmental awareness among local people and increased awareness of natural resource conservation can directly influence the success of sustainable forest management practices.

In Turkey, a significant portion of forest areas are intertwined with rural settlements, and the population living in these areas is defined as "forest villagers." It is known that approximately seven million people in Turkey live in forest villages, and their livelihoods largely depend on forest resources. Forest villagers are closely involved with forest ecosystems through the procurement of firewood, the collection of non-timber forest products, and various forestry activities (Alkan & Kılıç, 2014). Therefore, the perceptions, usage patterns, and environmental awareness levels of forest villagers regarding forest resources are considered important determining factors in the implementation of sustainable forestry policies.

Increasing local participation in forestry activities in Turkey has been a long-debated topic. The active involvement of local people and cooperatives in forest management is seen as an important tool for conserving resources and supporting rural development. Indeed, research shows that increasing participation in forestry activities improves the economic situation of forest villagers and strengthens their sense of social responsibility towards forest conservation (Atmiş et al., 2009). However, the level of local participation in forestry activities can be influenced by various socio-economic factors such as education level, income level, and environmental awareness.

Environmental awareness is an important concept encompassing individuals' knowledge, attitudes, and behaviors regarding the natural environment. In rural communities particularly dependent on forest resources, the level of environmental awareness plays a decisive role in the conservation and sustainable use of natural resources. Research conducted on forest-reliant communities reveals that when the local population has a high level of environmental awareness, behaviors aimed at conserving natural resources are more prevalent (Nelson & Chomitz, 2014).

In Turkey, various support programs and development projects are implemented within the framework of sustainable forestry policies to improve the living conditions of forest villagers and protect forest resources. However, the environmental awareness levels of forest villagers living in different regions and their interactions with local administrations may vary. Therefore, local-level research provides important data for evaluating the effectiveness of sustainable forest management practices and developing forestry policies.

The aim of this study is to determine the level of environmental awareness of individuals living in forest villages in the Akdağmadeni district of Yozgat province regarding the sustainable use of forest resources and to evaluate the role of local governments in this process. Within the scope of the research, the perceptions of the villagers towards forest resources, their usage habits, environmental awareness levels, and behavioral tendencies were examined and evaluated in terms of sustainable forest management. It is expected that the findings will contribute to policies and practices aimed at developing sustainable resource use in forest villages.

MATERIALS AND METHODS

Research Area and Selection

The study area of this research consists of forest villages located in Akdağmadeni district of Yozgat province. Akdağmadeni district is located in the Central Anatolia Region and is one of the richest districts in Yozgat province in terms of forest resources. The district has extensive forest areas where Scots pine (*Pinus sylvestris*), black pine (*Pinus nigra*), oak (*Quercus spp.*), cedar (*Cedrus spp.*), juniper (*Juniperus spp.)* and poplar (*Populus spp.)* species are widely distributed. The livelihoods of the forest villagers living in the region largely depend on forestry activities, timber and non-timber forest products, agriculture, and animal husbandry. Therefore, the forest villages in Akdağmadeni district constitute a suitable research area for evaluating the sustainable use of forest resources and the level of environmental awareness of the local population.

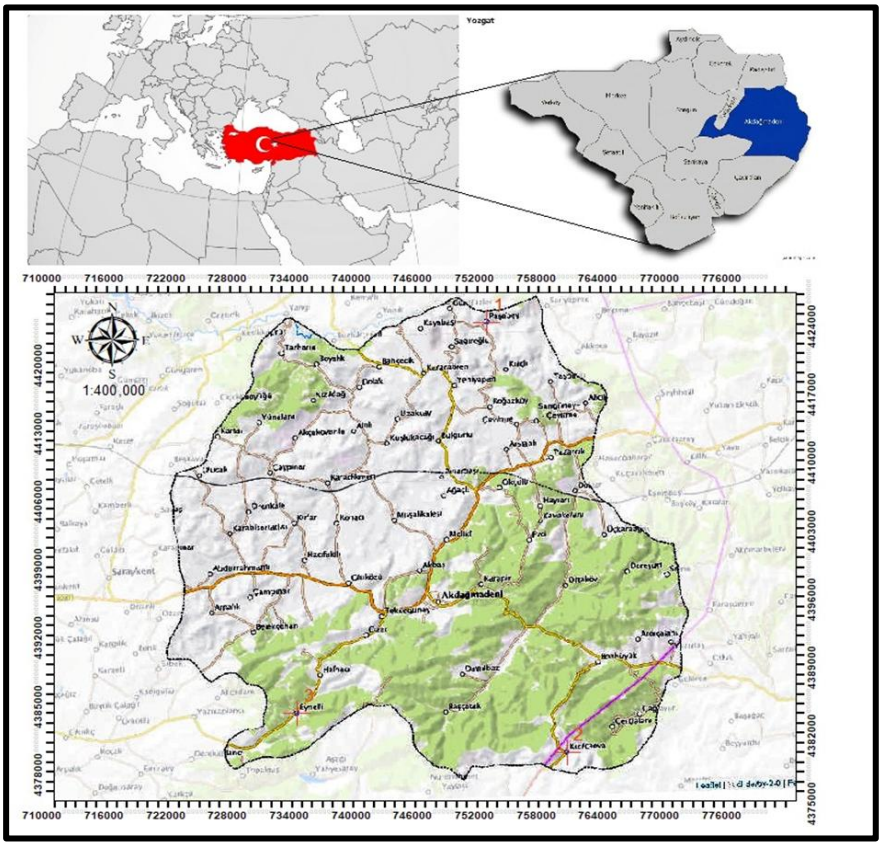


Figure 1. Study Area of Akdağmadeni District

Materials

This study was conducted within the forest villages located in the Akdağmadeni district of Yozgat province. Forest villagers actively involved in forestry activities in the region were included in the study. A questionnaire was developed for the study, and closed-ended questions were included in it. Ethical approval was obtained from the Yozgat Bozok University Social and Human Sciences Ethics Committee on March 23, 2026, under decision number 3/3, for the application of the questionnaire. The primary targets were the level of forest resource utilization, environmental awareness, local government participation and perception, and

behavioral tendencies. The questionnaire was administered through face-to-face interviews with forest villagers. The results were recorded, evaluated, and interpreted. The research materials consisted of data obtained from literature reviews, interview studies, and the questionnaire technique.

Method

Data collection tool

Data for this study were obtained through a survey method. The survey was conducted in March-April 2026 among citizens residing in forest villages of Akdağmadeni district, Yozgat province. The sample size for the survey was calculated using the equation $n=[N*t^2*p*q]/[d^2*(N-1)+ t^2*p*q]$ (Baş, 2005). Within the district's forest boundaries, 96 forest villages and a total population of 19,586 were identified, and the sample size was calculated as 389. A total of 400 individuals were interviewed. The SPSS 22 statistical package was used to evaluate the obtained data, and a significance level of 0.05 was used in the statistical analyses. The survey form included 4 different groups of questions, 6 of which were related to demographic characteristics. A 5-point Likert scale was used to determine agreement with the questions, with options being: "Strongly Disagree, Disagree, Undecided, Agree, and Strongly Agree". Cronbach's Alpha coefficient was used to calculate the reliability of the data. When the reliability analyses of the scale were examined as a result of the reliability analysis applied to the groups, values of 0.900 were obtained for the level of forest resource use, 0.879 for the level of environmental awareness, 0.917 for the perception of local government, and 0.901 for behavioral tendencies. The high Cronbach's alpha coefficients in all dimensions indicate that the scale generally has strong internal consistency (Table 1) (Kılıç, 2016).

Table 1. Reliability Coefficient (Kılıç, 2016)

Reliability Coefficient (α)	**Commentary**
≥0.9	Excellent
0.7≤α<0.9	Good
0.6≤α<0.7	Acceptable
0.5≤α<0.6	Weak
α<0.5	Unacceptable

Statistical analysis of the data

The data obtained in this study were analyzed using the SPSS 22.0 (Statistical Package for the Social Sciences) software package. Before starting the analysis process, the suitability of the data for a normal distribution was examined; for this purpose, kurtosis and skewness coefficients were evaluated, and values within the range of ±1.5 were considered sufficient for a normal distribution (Tabachnick & Fidell, 2013). Based on the findings, it was determined that all variables satisfied the assumption of a normal distribution.

Parametric tests were preferred in the analyses to ensure the assumption of normal distribution. Independent samples t-tests were used for comparing two groups, and one-way analysis of variance was used for comparing more than two groups. In cases where a significant difference was found, appropriate post hoc tests were used to determine which groups were responsible for the difference. Pearson correlation analysis was used to examine the relationships between variables.

The study also included a regression-based mediation analysis to examine the direct and indirect effects between variables. For this purpose, the Model 4 structure of the PROCESS macro developed by Hayes (2017) was used. In the mediation analysis, confidence intervals were calculated using the bootstrap method (5000 resampling), and the significance of the indirect effect was evaluated according to the criterion that the confidence interval should not include zero. In the analyses, effect sizes were interpreted using Cohen's d for independent groups and eta-squared values for analysis of variance. The statistical significance level was accepted as $p<0.05$.

FINDINGS

Socio-Demographic Characteristics of Participants

Table 2 presents the frequencies (n) and percentages (%) of gender, age, education level, occupation, household income, and years of residence of the participants in the survey.

Table 2. Distribution by Descriptive Characteristics

Gruplar	**Frequency (n)**	**Percentage (%)**
Gender		
Female	199	49.8
Male	201	50.2
Age group (years)		
18-30	91	22.8
31-40	75	18.8
41-50	66	16.5
51-60	89	22.2
≥ 61	79	19.8
Educational Status		
Primary school	114	28.5
Secondary school	92	23.0
High school	127	31.8
Associate degree	42	10.5
Bachelor's degree	25	6.2
Occupation		
Forestry	123	30.8
Livestock farming	96	24.0
Agriculture	120	30.0
Other	61	15.2
Household income		
Minimum wage ≤	135	33.8
Minimum wage - Double	149	37.2
Double- Quadruple	71	17.8
≥ Quadruple	45	11.2
Year of residence		
0-5	28	7.0
6-10	92	23.0
11-20	131	32.8
≥ 21	149	37.2

Table 2 shows that when examining the distribution of participants according to their descriptive characteristics, the proportions of female (49.8%) and male (50.2%) participants are very similar. Regarding age distribution, the highest percentage is in the 18-30 age group with 22.8%, followed by the 51-60 age group with 22.2%. 19.8% of participants are 61 years

and older, 18.8% are in the 31-40 age group, and 16.5% are in the 41-50 age group. In terms of education level, the largest group of participants are high school graduates (31.8%), followed by primary school graduates (28.5%) and middle school graduates (23.0%). The proportion of associate degree (10.5%) and bachelor's degree (6.2%) graduates is significantly lower.

According to occupational distribution, 30.8% of participants are engaged in forestry, 30.0% in agriculture, and 24.0% in animal husbandry, while 15.2% belong to other occupational groups. Regarding household income, the vast majority of participants (37.2%) have an income level up to twice the minimum wage, while 33.8% earn the minimum wage or less. The percentage of participants in higher income groups is relatively low. Examining length of residence, 37.2% of participants have lived in the same place for 21 years or more, 32.8% for 11–20 years, 23.0% for 6–10 years, and 7.0% for 0–5 years. These findings indicate that the sample largely consists of individuals who have lived in the same region for a long time.

Research Propositions

According to descriptive statistics, the distribution of the scale scores of the proposition groups is presented in Table 3.

Table 3. Distribution of Scale Scores According to Descriptive Statistics

	N	Mean	SD	Min.	Max.	Kurtosis	Skewness	Scale Range
Environmental Awareness	400	3.680	0.719	2.000	5.000	-1.059	-0.143	1-5
Perception of Local Government	400	3.510	0.808	2.000	5.000	-1.229	0.125	1-5
Use of Forest Resources	400	3.970	0.692	1.000	5.000	0.208	-0.714	1-5
Behavioral Tendency	400	3.560	0.787	2.000	5.000	-1.116	0.024	1-5

When the findings in Table 3 are examined, it is observed that the participants' average environmental awareness level is 3.680±0.719, indicating a moderate-to-high level of awareness according to the scale range. The average score regarding local government perception was determined as 3.510±0.808, indicating that the participants' perceptions of local governments are above the moderate level. When the level of forest resource use is examined, the mean score of 3.970±0.692 is higher than the other variables, indicating that the participants' level of forest resource use is high. The mean behavioral tendency score was 3.560±0.787, showing that the participants' environmentally oriented behaviors are above the moderate level. The graph showing the graphical distribution of scale scores is shown in Figure 2.

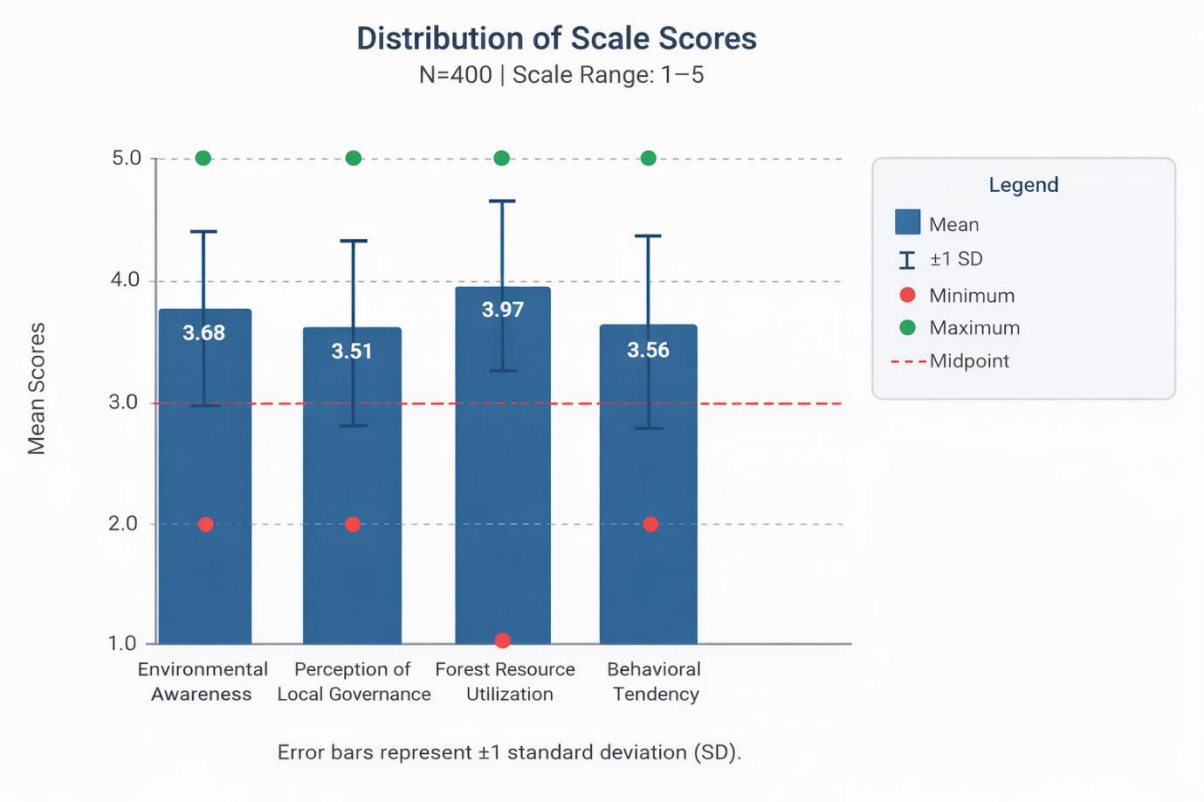


Figure 2. Graphical Distribution of Scale Scores

The statistical data of the correlation analysis for the proposition groups are presented in Table 4.

Table 4. Correlation Analysis

		Environmental Awareness	Perception of Local Government	Use of Forest Resources	Behavioral Tendency
Environmental Awareness	**r**	1.000			
	p	0.000			
Perception of Local Government	**r**	0.887**	1.000		
	p	0.000	0.000		
Use of Forest Resources	**r**	0.661**	0.501**	1.000	
	p	0.000	0.000	0.000	
Behavioral Tendency	**r**	0.741**	0.861**	0.502**	1.000
	p	0.000	0.000	0.000	0.000

*<0.05; **<0.01; Pearson Correlation Analysis

When the correlation analysis findings presented in Table 4 are examined, it is observed that there are statistically significant and positive relationships among all variables ($p<0.01$). A very high positive relationship was found between environmental awareness and local government

perception (r=0.887). Similarly, there was a high positive relationship between environmental awareness and behavioral tendency (r=0.741), and a moderately high positive relationship between environmental awareness and the level of forest resource use (r=0.661). There was also a very high positive relationship between local government perception and behavioral tendency (r=0.861) and a moderate positive relationship between local government perception and the level of forest resource use (r=0.501). In addition, a moderate positive relationship was found between the level of forest resource use and behavioral tendency (r=0.502). These findings reveal that environmental awareness and local government perception are strongly related to behavioral tendency and that all variables display a mutually supportive structure.

Mediation analysis was applied to examine the role of the level of forest resource use in the effect of environmental awareness level on behavioral tendency. The statistical data related to the analysis are presented in Table 5.

Table 5. The Mediating Role of the Level of Forest Resource Use in the Effect of Environmental Awareness Level on Behavioral Tendency

Dependent Variable	Independent Variable	ß	SE	t	p	%95 CI Below	%95 CI Above
Use of forest resources	Environmental awareness level (a)	0.662	0.026	17.597	**0.000**	0.404	0.506
R=0.662; R-sq=0.438; F=309.652; p=0.000							
Behavioral tendency	Environmental awareness level ©	0.741	0.026	22.010	**0.000**	0.527	0.631
R=0.741; R-sq=0.549; F=484.455; p=0.000							
Behavioral tendency	Environmental awareness level (c')	0.728	0.035	16.191	**0.000**	0.500	0.638
	Use of forest resources (b)	0.020	0.051	0.452	0.652	-0.077	0.124
R=0.741; R-sq=0.549; F=241.845; p=0.000							
Total Effect		0.579	0.026	22.010	0.000	0.527	0.631
Direct Effect		0.569	0.035	16.191	0.000	0.500	0.638
Indirect Effect		0.013	0.031	-	-	-0.048	0.073

When Table 5 is examined, the mediation analysis shows that the effect of environmental awareness level on the level of forest resource use was statistically significant (β=0.662, SE=0.026, t=17.597, p<0.001). When the explanatory level of the model is examined, it is seen that environmental awareness level explains 43.8% of the variance in the level of forest resource use (R=0.662, R^2=0.438, F=309.652, p<0.001). This finding indicates that as individuals' environmental awareness increases, their level of forest resource use also increases significantly.

When the total effect of environmental awareness level on behavioral tendency is examined, this effect was found to be positive and statistically significant (β=0.741, SE=0.026, t=22.010, p<0.001). The explanatory power of the model is quite high, and environmental awareness level explains 54.9% of the variance in behavioral tendency (R=0.741, R^2=0.549, F=484.455, p<0.001). When the mediator variable was included in the model, the direct effect of environmental awareness level on behavioral tendency continued with some decrease (β=0.728, SE=0.035, t=16.191, p<0.001) but remained significant. In contrast, the effect of the level of forest resource use on behavioral tendency was not statistically significant (β=0.020, SE=0.051, t=0.452, p=0.652).

When the total, direct, and indirect effects are evaluated together, it is seen that the total effect of environmental awareness level on behavioral tendency is significant (β=0.579, p<0.001), and the direct effect similarly remains significant (β=0.569, p<0.001). However, when the indirect effect is examined, it is understood that the confidence interval includes zero (-0.048; 0.073) and that this effect is not statistically significant. Accordingly, it was concluded that the level of forest resource use does not play a mediating role in the relationship between environmental awareness level and behavioral tendency and that the relationship occurs largely directly. The mediating model of forest resource utilization level in the relationship between environmental awareness level and behavioral tendencies is shown in Figure 3.

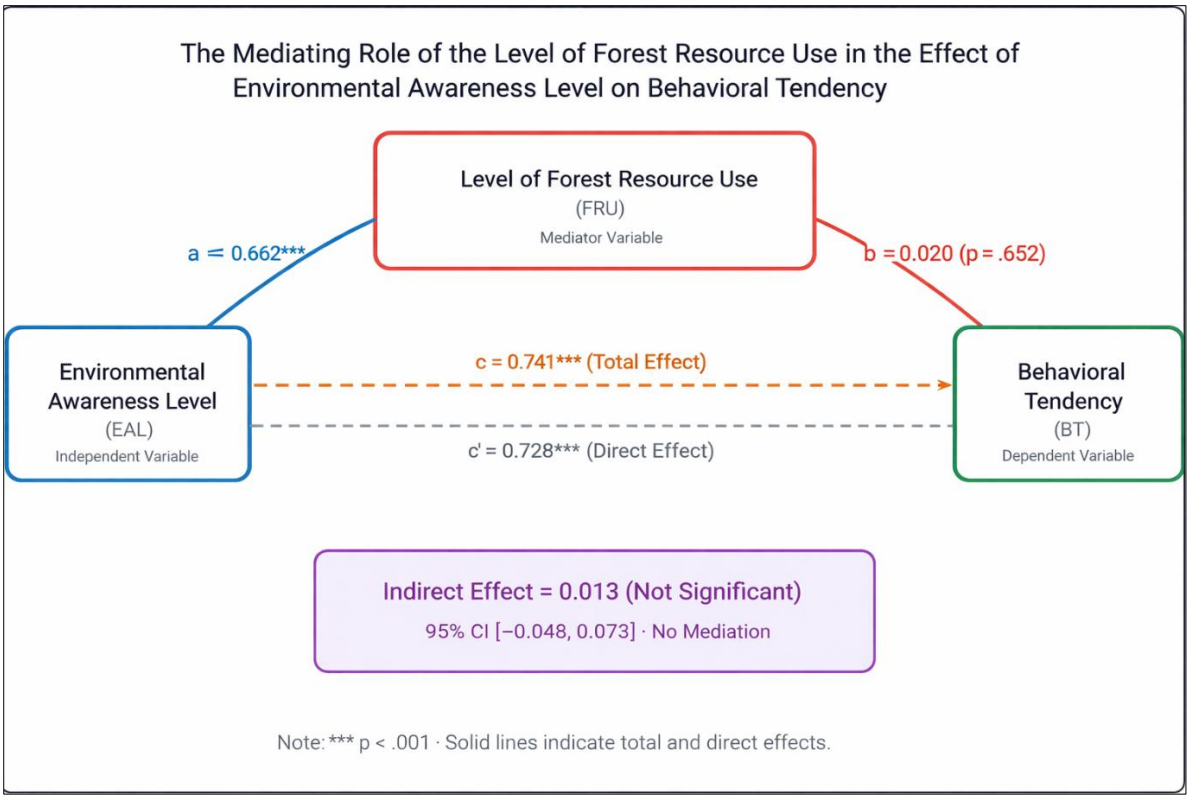


Figure 3. Mediation Model of the Level of Forest Resource Use in the Relationship Between Environmental Awareness Level and Behavioral Tendency

Mediation analysis was applied to measure the level of forest resource use in the effect of local government perception on behavioral tendency. The statistical data related to the analysis are presented in Table 6.

When Table 6 is examined, the mediation analysis showed that the effect of local government perception on the level of forest resource use was statistically significant (β=0.501, SE=0.027, t=11.544, p<0.001). When the explanatory level of the model is examined, it is seen that local government perception explains 25.1% of the variance in the level of forest resource use (R=0.501, R^2=0.251, F=133.266, p<0.001). This finding indicates that as individuals' perceptions of local governments increase, their level of forest resource use also increases significantly.

Table 6. The Mediating Role of the Level of Forest Resource Use in the Effect of Local Government Perception on Behavioral Tendency

Dependent Variable	Independent Variable	ß	SE	t	p	%95 CI Below	%95 CI Above
Use of forest resources	Perception of local government (a)	0.501	0.027	11.544	**0.000**	0.254	0.359
R=0.501; R-sq=0.251; F=133.266; p=0.000							
Behavioral tendency	Perception of local government (c)	0.861	0.018	33.808	**0.000**	0.564	0.634
R=0.861; R-sq=0.742; F=1142.975; p=0.000							
Behavioral tendency	Perception of local government (c')	0.814	0.020	27.992	**0.000**	0.527	0.606
	Use of forest resources	0.094	0.033	3.221	**0.001**	0.042	0.172
R=0.865; R-sq=0.748; F=590.133; p=0.000							
Total Effect		0.599	0.018	33.808	0.000	0.564	0.634
Direct Effect		0.567	0.020	27.992	0.000	0.527	0.606
Indirect Effect		0.047	0.015	-	-	0.018	0.077

When the total effect of local government perception on behavioral tendency is examined, this effect was found to be very strong, positive, and statistically significant (β=0.861, SE=0.018, t=33.808, p<0.001). The explanatory power of the model is quite high, and local government perception explains 74.2% of the variance in behavioral tendency (R=0.861, R^2=0.742, F=1142.975, p<0.001). When the mediator variable was included in the model, the direct effect of local government perception on behavioral tendency continued with some decrease (β=0.814, SE=0.020, t=27.992, p<0.001) but remained significant. In addition, the effect of the level of forest resource use on behavioral tendency was also statistically significant (β=0.094, SE=0.033, t=3.221, p=0.001).

When the total, direct, and indirect effects are evaluated together, it is seen that the total effect of local government perception on behavioral tendency is significant (β=0.599, p<0.001), and the direct effect also remains significant (β=0.567, p<0.001). When the indirect effect is examined, the confidence interval does not include zero (0.018; 0.077), and this effect is statistically significant. Accordingly, it was concluded that the level of forest resource use plays a partial mediating role in the relationship between local government perception and behavioral tendency. The mediating model of forest resource utilization levels in the relationship between local government perception and behavioral tendencies is shown in Figure 4.

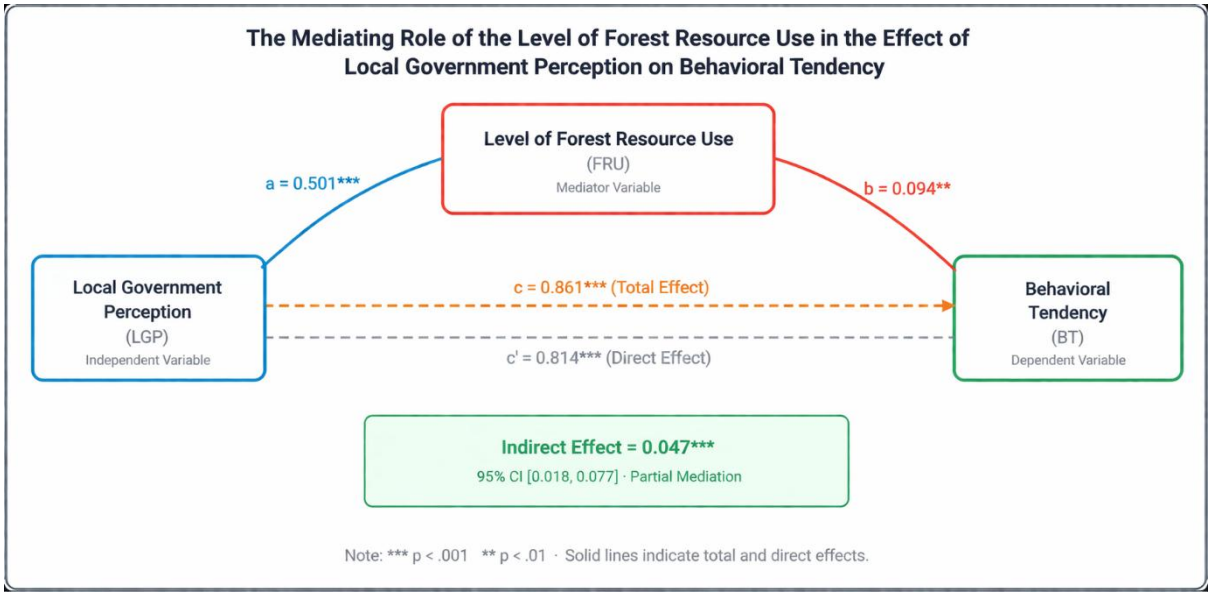


Figure 4. Mediation Model of the Level of Forest Resource Use in the Relationship Between Local Government Perception and Behavioral Tendency

The findings regarding the differentiation status of the participants' scale scores according to descriptive characteristics are presented in Table 7.

When the differentiation status of scale scores according to descriptive characteristics in Table 7 is examined, it is determined that there is a significant difference only in the level of forest resource use by gender ($p=0.015$). Accordingly, women's mean scores for the level of forest resource use are higher than men's, and the effect size can be said to be small ($d=0.247$). No significant difference was found by gender for the other variables ($p>0.05$).

In the analysis by age groups, no statistically significant difference was found in environmental awareness, local government perception, level of forest resource use, or behavioral tendency scores ($p>0.05$). This finding indicates that the age variable does not have a determining effect on the scale scores examined.

In the analysis by education level, significant differences were found in environmental awareness and local government perception scores ($p<0.05$). According to the post hoc analysis results, the mean scores of high school, associate degree, and bachelor's degree graduates were higher than those of primary and middle school graduates. When effect size values are examined, these differences are understood to be small ($\eta^2=0.033$; $\eta^2=0.037$). In contrast, no significant difference was found by education level in terms of the level of forest resource use and behavioral tendency scores ($p>0.05$).

According to the occupation variable, statistically significant differences were found in all scale scores ($p<0.001$). The post hoc analysis results show that individuals engaged in forestry have significantly higher environmental awareness, local government perception, level of forest resource use, and behavioral tendency scores than the other occupational groups. When effect sizes are examined, these differences are particularly high for environmental awareness, local government perception, and behavioral tendency ($\eta^2=0.493$; $\eta^2=0.569$; $\eta^2=0.538$), and moderate for the level of forest resource use ($\eta^2=0.214$).

Table 7. Differences in Scale Scores by Descriptive Characteristics

Demographic Characteristics	n	Environmental Awareness	Perception of Local Government	Use of Forest Resources	Behavioral Tendency
Gender		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Female	199	3.69±0.72	3.53±0.81	4.05±0.66	3.58±0.77
Male	201	3.66±0.72	3.49±0.80	3.88±0.72	3.53±0.80
t=		0.511	0.540	2.437	0.578
p=		0.610	0.589	**0.015**	0.563
d=				0.247	
Age		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
18-30	91	3.71±0.73	3.57±0.80	3.93±0.70	3.61±0.79
31-40	75	3.61±0.72	3.52±0.75	3.93±0.69	3.57±0.77
41-50	66	3.70±0.75	3.53±0.90	4.00±0.69	3.58±0.81
51-60	89	3.69±0.67	3.50±0.75	3.96±0.64	3.53±0.77
≥ 61	79	3.67±0.75	3.44±0.86	4.02±0.75	3.49±0.82
F=		0.247	0.329	0.267	0.314
p=		0.911	0.858	0.899	0.869
Educational Status		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Primary school	114	3.59±0.80	3.39±0.92	3.98±0.67	3.52±0.78
Secondary school	92	3.52±0.73	3.34±0.75	3.87±0.69	3.45±0.78
High school	127	3.77±0.68	3.62±0.76	4.01±0.73	3.61±0.80
Associate degree	42	3.85±0.59	3.73±0.73	3.98±0.64	3.70±0.78
Bachelor's degree	25	3.90±0.55	3.77±0.60	4.04±0.71	3.58±0.79
F=		3.342	3.825	0.720	1.044
p=		**0.010**	**0.005**	0.578	0.384
η^2=		0.033	0.037		
PostHoc=		3>1, 4>1, 5>1, 3>2, 4>2, 5>2 (p<0.05)	3>1, 4>1, 5>1, 3>2, 4>2, 5>2 (p<0.05)		
Occupation		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Forestry	123	4.43±0.25	4.43±0.29	4.43±0.34	4.42±0.31
Livestock farming	96	3.38±0.57	3.12±0.64	3.74±0.70	3.13±0.66
Agriculture	120	3.34±0.60	3.11±0.61	3.86±0.64	3.25±0.57
Other	61	3.28±0.63	3.08±0.57	3.60±0.84	3.10±0.60
F=		128.493	174.475	35.850	153.987
p=		**0.000**	**0.000**	**0.000**	**0.000**
η^2=		0.493	0.569	0.214	0.538
PostHoc=		1>2, 1>3, 1>4 (p<0.05)	1>2, 1>3, 1>4 (p<0.05)	1>2, 1>3, 1>4, 3>4 (p<0.05)	1>2, 1>3, 1>4 (p<0.05)
Household income		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Minimum wage ≤	135	3.59±0.77	3.50±0.86	3.87±0.71	3.55±0.78
Minimum wage - Double	149	3.73±0.70	3.55±0.78	3.96±0.72	3.56±0.78
Double- Quadruple	71	3.60±0.65	3.38±0.74	4.06±0.66	3.46±0.77
≥ Quadruple	45	3.86±0.71	3.64±0.83	4.16±0.56	3.70±0.85
F=		2.274	1.130	2.520	0.840
p=		0.079	0.337	0.058	0.472
Year of residence		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
0-5	28	3.82±0.78	3.81±0.76	3.65±0.92	3.75±0.84
6-10	92	3.56±0.78	3.42±0.85	3.72±0.75	3.47±0.88
11-20	131	3.65±0.72	3.53±0.83	3.95±0.66	3.55±0.79
≥ 21	149	3.74±0.66	3.50±0.76	4.19±0.56	3.58±0.70
F=		1.582	1.654	12.078	0.991
p=		0.193	0.176	**0.000**	0.397
η^2=				0.084	
PostHoc=				3>1, 4>1, 3>2, 4>2, 4>3 (p<0.05)	

F: ANOVA Test; t: Independent Samples t-Test; PostHoc: Tukey, LSD

In the analysis by household income, no statistically significant difference was found for any of the scale scores ($p>0.05$). This indicates that income level does not have a significant effect on the variables examined.

In the analysis by duration of residence, a significant difference was found only in the level of forest resource use scores ($p<0.001$). According to the post hoc analysis results, the scores of individuals who had lived in the same place for 11-20 years and 21 years or more were higher than those of individuals with shorter residence periods. When effect size is examined, this difference is understood to be moderate ($\eta^2=0.084$). No significant difference was found according to duration of residence for the other variables ($p>0.05$).

DISCUSSION AND CONCLUSION

This study aims to examine the relationships among the environmental awareness levels, perceptions of local government, levels of forest resource use, and environmentally oriented behavioral tendencies of individuals living in forest villages in Akdagmadeni district. The findings obtained were evaluated through a holistic approach within the framework of descriptive statistics, group differences according to demographic variables, correlations among variables, and mediation analyses, and were compared with the relevant literature.

Findings on Descriptive Statistics and Scale Scores

When the averages obtained from the findings regarding descriptive statistics and scale scores are evaluated together, it is observed that the environmental awareness levels (Mean=3.68±0.72) and behavioral tendencies (Mean=3.56±0.79) of participants living in forest villages in Akdagmadeni district are at a moderate-to-high level, while their perceptions of local government (Mean=3.51±0.81) are above the moderate level. Although the level of forest resource use (Mean=3.97±0.69) has the highest mean compared with the other variables, the overall distribution pattern is consistent with recent studies showing that environmental awareness is not completely low in rural communities that have subsistence-based or everyday relationships with forests, and that natural resource use remains strongly intertwined with daily life practices. Indeed, it is emphasized that environmental awareness can develop in rural communities, but factors such as economic dependence, governance quality, participation mechanisms, and environmental education are decisive in transforming this awareness into sustainable behavior (Apipoonyanon et al., 2020; Savari et al., 2020; Tesfaye, 2017).

The finding that the average environmental awareness is at a moderate-to-high level shows that the participants are not indifferent to environmental issues. In contrast, the fact that the forest resource use score has the highest mean suggests that forest resources still occupy a central place in household life and rural livelihoods. Similarly, the literature on community-based forestry and participatory forest management shows that even if local people acknowledge the ecological importance of forests, their level of use for basic needs such as fuelwood, timber, grass, and fodder remains high (Pokhrel & Gautam, 2024; Ullah & Bavorova, 2025). The fact that the perception of local government is above the moderate level is also an important finding because, in sustainable forest management, it has been reported that as trust in local institutions increases, conservation-oriented behaviors can become stronger (Balanay et al., 2025; Jetony et al., 2022). However, the literature also emphasizes that local government perception alone is not sufficient; when it is not supported by real participation opportunities, fair benefit

sharing, inclusive governance, and continuous environmental education, positive perception may be reflected in behavior only to a limited extent (Mogotsi et al., 2016; Savari et al., 2020). Therefore, this finding shows that there is a certain potential in the research area in terms of environmental awareness and behavioral tendency, but that the main determinant for sustainable forest resource use is the extent to which this potential is supported by the participatory, educational, and regulatory practices of local governments.

Differentiation of Scale Scores by Demographic Variables

An examination of the differentiation of scale scores by demographic variables indicates that gender yields a statistically significant difference only in the level of forest resource use ($p=0.015$). Specifically, female participants report higher mean use scores than male participants, although the effect size remains small ($d=0.247$). This finding aligns with previous research suggesting that women in rural contexts tend to maintain a more intensive and direct relationship with forest resources within the framework of household economy and livelihood strategies (Mogotsi et al., 2016). In contrast, no statistically significant gender-based differences were identified in environmental awareness, local government perception, or behavioral tendency scores ($p>0.05$), supporting the notion that gender effects on environmental attitudes and behaviors are context-dependent and shaped by socio-cultural structures.

In terms of the age, no significant difference was found in any of the four scale scores examined ($p>0.05$). This finding suggests that differences in environmental awareness and behavioral tendencies among age groups are shaped in a context-specific manner and that age may not be a determining factor in relatively homogeneous communities such as forest villages.

In terms of educational attainment, statistically significant differences emerged in environmental awareness and local government perception scores ($p<0.05$). Post hoc analyses indicate that individuals with high school, associate degree, and bachelor's degree education levels exhibit higher mean scores compared to those with primary and secondary education. This finding is consistent with the extensive literature documenting a positive association between education, environmental awareness, and institutional trust, as higher education levels facilitate access to environmental knowledge and enhance engagement with governance processes (Savari et al., 2020). However, no significant differences were found in forest resource use or behavioral tendency scores across education levels ($p>0.05$), suggesting that everyday practices related to resource use are shaped more by livelihood conditions and economic constraints than by formal education.

The most prominent demographic differences in the study were obtained through the occupation variable. Statistically significant differences were found in all four scale scores according to occupation ($p<0.001$); individuals engaged in forestry had significantly higher environmental awareness, local government perception, level of forest resource use, and behavioral tendency scores than the other occupational groups. When effect sizes are examined, it is noteworthy that these differences are very high for environmental awareness ($\eta^2=0.493$), local government perception ($\eta^2=0.569$), and behavioral tendency ($\eta^2=0.538$). This finding is highly important in that it reveals the strong determining influence of occupational identity and everyday relationship with the forest on environmental awareness and institutional perception. The continual contact of individuals who earn their living through forestry with the forest ecosystem creates a basis for the development of both practical knowledge and a sense

of environmental responsibility. This pattern is consistent with studies showing that occupational experience and direct interaction with natural resources shape environmental attitudes and behaviors (Pokhrel & Gautam, 2024; Apipoonyanon et al., 2020).

In the analysis by household income, no statistically significant difference was found for any of the scale scores ($p>0.05$). This finding may be related to insufficient variance because the large majority of the study sample falls within similar income brackets. In terms of duration of residence, however, a significant difference was found only in the level of forest resource use scores ($p<0.001$). According to the post hoc analyses, the use scores of individuals who had resided in the same place for 11 years or more were significantly higher than those of individuals with shorter residence durations, and the effect size was moderate ($\eta^2=0.084$). This finding suggests that long-term residence and spatial rootedness contribute to a deeper integration of forest resources into daily life, reflecting an accumulative and experiential process of familiarity and use.

Correlation Analysis Findings

When the findings of the correlation analysis are examined, it is observed that there are statistically significant and positive relationships among the four variables addressed in the study ($p<0.01$). The most striking relationship is the very high correlation observed between environmental awareness and local government perception ($r=0.887$). This finding indicates that individuals with high environmental awareness also have high trust in and expectations of local institutional structures; it reveals the strong structural overlap between environmental values and institutional orientation. Similar findings have also been reported in studies in which environmental attitudes and the quality of local governance are evaluated together (Xie, 2016; Chen, 2023).

The relationship between local government perception and behavioral tendency ($r=0.861$) was also very high and positive. This strong relationship reveals that as individuals' trust in local institutions and their perception of participation increase, their positive environmental behavioral tendencies also strengthen; it supports the broad literature documenting the relationship between institutional trust and pro-environmental behavior (Lulu et al., 2025; Abdulai, 2025). The correlation between environmental awareness and behavioral tendency is likewise high ($r=0.741$). This relationship reflects the direct determining role of cognitive awareness on attitudinal tendencies and shows that the knowledge and values an individual has regarding the environment strengthen behavioral intentions (Lundberg et al., 2018; Moreno-Llamas et al., 2024). The relationship between the level of forest resource use and behavioral tendency ($r=0.502$) and the relationship between environmental awareness and forest resource use ($r=0.661$) were found to be moderately high, and both relationships remained significant. These findings support the internal coherence of the research model by showing that all variables display a mutually consistent structure.

The Mediating Role of the Level of Forest Resource Use in the Effect of Environmental Awareness Level on Behavioral Tendency

The findings obtained in Table 5 show that environmental awareness level has a strong and significant effect on forest resource use ($\beta=0.662$, $R^2=0.438$, $p<0.001$). This relationship indicates that individuals with higher environmental awareness also use forest resources in a more conscious and systematic manner. However, the positive direction of the relationship

should be evaluated carefully. Because forest resources constitute a central means of subsistence in rural communities, an increase in use does not necessarily mean overexploitation; rather, it may also indicate conscious and sustainable use. In this respect, the finding is consistent with studies showing that environmental awareness not only limits resource use but can also transform it into a more planned and responsible practice (Tesfaye, 2017; Savari et al., 2020).

The total effect of environmental awareness level on behavioral tendency was found to be high and significant (β=0.741, R^2=0.549, $p<0.001$); when the mediator variable was included in the model, this direct effect was seen to retain its significance (β=0.728, $p<0.001$). In contrast, the effect of the level of forest resource use on behavioral tendency was not statistically significant (β=0.020, p=0.652), and the confidence interval of the indirect effect was found to include zero (CI: -0.048; 0.073). These findings show that the level of forest resource use does not play a mediating role in the relationship between environmental awareness and behavioral tendency; rather, the relationship occurs largely directly. This is consistent with recent studies showing that the relationship between environmental awareness and environmental behavior often displays a direct structure and that intermediary variables do not always create a significant mediation effect (Lundberg et al., 2018; Moreno-Llamas et al., 2024).

Some studies emphasize that certain social and psychological variables (such as place attachment, social cohesion, and personal norms) may play a mediating role in the relationship between environmental awareness and behavior, but that this mediation is context-specific (Zhou et al., 2023; Sun et al., 2024). In this framework, the fact that the mediating role of the level of forest resource use was not significant in the present study suggests that natural resource use alone is not a transformative mechanism in producing behavior. In other words, the mere fact that individuals use forest resources does not automatically determine their environmental behaviors; the main determining factor is the level of environmental awareness. This finding also aligns with policy recommendations emphasizing that interventions aimed at increasing individuals' environmental awareness should be prioritized in the development of sustainable environmental behaviors (Weisner & Cameron, 2020).

The Mediating Role of the Level of Forest Resource Use in the Effect of Local Government Perception on Behavioral Tendency

The findings obtained in Table 6 reveal that the effect of local government perception on behavioral tendency occurs both directly and indirectly, and that the level of forest resource use plays a partial mediating role in this relationship. The significant effect of local government perception on the level of forest resource use (β=0.501, R^2=0.251, $p<0.001$) is parallel to studies showing that factors such as trust in local institutions, perceptions of governance, and satisfaction with public services shape individuals' natural resource use practices. It is emphasized that the support, regulations, and participation mechanisms provided by local governments directly affect individuals' access to resources and patterns of use, and that governance structures are decisive in behavioral outcomes in this process (Chen, 2023; Abdulai, 2025).

The fact that the total effect of local government perception on behavioral tendency is very high (β=0.861, R^2=0.742, $p<0.001$) shows that environmental behaviors are nourished not only by individual awareness but also strongly by the effectiveness of institutional structures and the quality of local governance. This finding is consistent with the literature showing that

increasing trust in public institutions and perceptions of participation in environmental governance processes reinforces individuals' environmental behaviors (Lulu et al., 2025; Xie, 2016). This finding of the study is particularly important in the context of rural communities, because institutional legitimacy and governance quality emerging from the local level facilitate the collective adoption of sustainable resource management behaviors.

When the mediator variable was included in the model, it was determined that the level of forest resource use had a significant effect on behavioral tendency (β=0.094, p=0.001) and that the confidence interval of the indirect effect did not include zero (CI: 0.018; 0.077). These findings confirm that the level of forest resource use plays a partial mediating role in the relationship between local government perception and behavioral tendency. This indicates that the policies, regulations, and incentives created by local governments shape environmental behaviors indirectly by influencing individuals' patterns of resource use. Similarly, it is stated that local institutions and leadership in natural resource management play a critical role in guiding individuals' behaviors and that this effect often operates through usage practices (Andersson et al., 2020). Some studies also show that the relationship between local perception and behavior may be strengthened through certain intervening variables, thereby reinforcing the theoretical consistency of the partial mediation finding in this context (Purnomo et al., 2017).

As a result, these findings reveal that the role of local governments in sustainable forest management is twofold: on the one hand, they function as an institutional factor directly affecting behaviors; on the other hand, they create an indirect effect on behaviors by shaping individuals' natural resource use practices. This indicates that local governments should be positioned not only as policy makers but also as actors that transform behavior. Indeed, the observation that the highest mediation power was found through local government perception, while mediation remained insignificant in the environmental awareness model, suggests that institutional structure offers a stronger mediation mechanism than individual cognitive factors.

General Evaluation

When the findings obtained from the study are evaluated as a whole, it is understood that individuals living in the forest villages of Akdagmadeni district possess the potential for environmental awareness and behavioral tendencies; however, institutional capacity and the quality of local governance play a decisive role in transforming this potential into real and sustainable behavior. The fact that local government perception predicts behavioral tendency both directly and indirectly through the level of forest resource use confirms that local institutions serve a key function in shaping individuals' environmental behaviors. In contrast, the inability of forest resource use to assume a mediating role in the effect of environmental awareness on behavioral tendency shows that cognitive awareness and practical patterns of resource use do not fully overlap; awareness is reflected in behavior largely directly and independently of indirect mechanisms.

In this context, the research findings reveal that sustainable rural forestry policies should focus simultaneously on raising the level of individual environmental awareness and strengthening local governance capacity and participation mechanisms. In particular, the fact that occupation-related differences display extremely high effect sizes shows that individuals directly connected with the forestry sector stand out clearly in terms of environmental knowledge and behavior; this demonstrates the importance of considering these groups as resource persons

and models in environmental education and local participation processes. The finding that long residence duration affects only the use of forest resources suggests that rootedness and familiarity deepen usage practices, but that this experience does not automatically translate into higher environmental awareness or behavioral tendency. This once again brings to the fore the necessity of participatory approaches sustained by awareness-raising and institutional support, beyond mere experience.

AUTHOR CONTRIBUTIONS

Only one author contributed to this study.

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CONFLICT OF INTEREST STATEMENT

The author declares no conflict of interest.

ETHICS COMMITTEE APPROVAL

Ethic committee approval was obtained for this study from Yozgat Bozok University Social and Human Sciences Ethical Committee on 23.03.2026 with document number of 3/3.

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