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Environmental attitudes of producers for conservation and sustainability of wetlands; Seyfe Lake Wetland-Türkiye

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Graphical abstract

Abstract

Wetlands are among the most important ecosystems in the world. Therefore, they offer rich biodiversity in the areas where they are located. However, despite all legal regulations, wetlands are at risk both globally and in Türkiye. This risk is mainly caused by the negative effects of climate change and unsustainable practices of those living in wetlands. Therefore, it is important to understand the attitudes of people living in these areas towards wetlands. In this study, we attempted to determine the environmental attitudes of producers engaged in agricultural activities in six villages bordering Seyfe Lake Wetland, which is under protection in Türkiye under the RAMSAR Convention, using the New Environmental Paradigm Scale (NEPS). Thus, this study aimed to reveal the relationship between wetlands and humans. In this context, face-to-face questionnaires were filled out by 119 producers who had land in the Seyfe Lake Wetland in 2023. As a result, it was determined that producers' environmental attitudes were moderate. While this situation has a negative impact on the conservation and sustainability of the Seyfe Lake Wetland, producers believe that the damage and/or destruction of the existing wetland will not have a significant negative impact on household livelihoods and incomes. As a result, there is a need for sustainable wetland management systems that involve people living in the region to achieve sustainability in wetland management in Türkiye. A high level of interest and conservation motivation will only be possible if there is a positive relationship between these areas and their inhabitants. Simultaneously, it is important to support the producers operating in the region in terms of wetland conservation.

Key words: Wetlands, the new environmental paradigm scale, environmental attitude, sustainable management

1. Introduction

Wetlands are simply defined as "transition zones between terrestrial and aquatic ecosystems". They are distinguished by the presence of a certain amount of water in their systems for a significant part of the year and plants and animals adapted to this water (The Wetlands Initiative, 2024). Wetlands, which have been home to the majority of the world's population for centuries, are among the most important ecosystems because of their economic returns, rich biodiversity (Zedler, 2000; Jessop *et al*., 2015; Mitsch and Gosselink, 2015; Yıldız Karakoç, 2017), and cultural and ecological value (Yıldız Karakoç, 2017). Wetlands, which are the world's most important genetic reservoirs, comprise 40% of all species and 12% of all animal species in the world, as well as many functions, such as flood control, groundwater recharge, shoreline and storm protection, climate change mitigation, and sediment, nutrient, and water purification. They offer many benefits such as wetland products, recreation, and tourism (WWF, 2008). Wetlands are among the most important ecosystems in the world, owing to their ecosystem characteristics. Therefore, they offer rich biodiversity in the areas where they are located (Ramsar Convention on Wetlands, 2018). In areas with dense biodiversity, ecosystems have delicate balances and are fragile (Kotze, 1996; Mitsch and Gosselink, 2015). Disruption in any part of the ecosystem puts the entire ecosystem in danger of extinction (Çeşmeci, 2010).

Wetlands have always been the focus of human activities and, therefore, of economic interest since humans have existed. The first settlement centers animal husbandry and agricultural activities have always taken place around wetlands (Ün, 1995). However, the economies of countries that have experienced a breakthrough, especially with the onset of the Industrial Revolution, have greatly damaged nature to meet the needs of people in their social lives (Folk, 2021). As a result, the ecological balance has deteriorated. The existing inverse relationship between industrialisation, especially high energy use due to industrialisation, unplanned

urbanisation and the environment has been the subject of many studies both in terms of revealing the current situation and the measures to be taken (Liqin *et al*., 2024; Shenglin *et al*., 2024; Tong *et al*., 2024; Wang *et al*., 2024; Zou *et al*., 2024). People around the world still need products provided by nature for their vital activities. There are difficulties in accessing water, which is the most valuable element of the ecosystem, in many regions of the world (World Water Council, 2018; Tortajada and Fernandez, 2018). Owing to climate change, drought and access to water will be among the most important problems of the world in the future (Ateş, 2008; Fıstıkoğlu and Biberoğlu, 2008; Kanber *et al*., 2010; WEF, 2023). As a result of the use and pollution of water as if it is an inexhaustible resource, water problems have come to our doorstep. With economic growth, groundwater reservoirs are depleted, wetlands are deforested, and rivers are used at ecologically damaging levels, ignoring the protection of natural balance. An unsustainable approach to agricultural production, industrial growth, and urban development has damaged many aquatic ecosystems that feed fish species, provide shelter for water birds and other animals, and maintain water quality. Population growth, industrialization, and urbanization have led to a rapid increase in water demand, while the amount of usable freshwater is decreasing owing to the pollution of water resources, resulting in serious water problems (Tortajada and Fernandez, 2018). Declining groundwater reserves, decreasing groundwater levels, increasing floods and droughts, and unbalanced water budgets are clear indicators of ineffective water use and ecological damage (Özdemir, 2005). As a result of such activities, frequent human interventions since 1970 have significantly affected natural wetlands, with approximately 30-35% of wetlands disappearing and the rest facing serious threats due to human activities (Hu *et al*., 2017; Gardner and Finlayson, 2018; Convention on Wetlands, 2021).

As climate change affects natural ecosystems worldwide and the survival of people, wetlands must inevitably adapt to these changing conditions. Therefore, both wetlands worldwide and the animal and plant populations living within them have become more important. The conservation and sustainable management of wetlands play an irreplaceable role in regulating the global climate, maintaining the global hydrological cycle, preserving ecosystem diversity and protecting human welfare (Costanza *et al*., 1997; Ramsar Convention Bureau, 2001; Smardon, 2009; Hu *et al*., 2017). It has been revealed that animal and plant populations living in wetlands should be protected for the future of humanity, considering natural balance and the contributions they provide to the lives of people (Kanat and Keskin, 2018). This situation has gained even more importance with the Covid-19 pandemic (Convention on Wetlands, 2021)

The development of the concept of wetland conservation can be considered partly a consequence of global climate change affecting the whole world. Climate change and the misuse of wetlands have led countries to make legal arrangements to protect wetlands within their borders and to increase their sustainability. Provisions of national legislation, as well as regional decisions, have been taken for the protection and sustainable use of wetlands. Wetlands have been protected at certain rates depending on the implementation of these legal arrangements by the state. Despite this, wetlands are still at risk, as the loss of a significant proportion of wetlands constitutes one of the most important problems. For terrestrial and freshwater ecosystems, land-use change has had the greatest relative negative impact on nature since 1970 (Convention on Wetlands, 2021).

In Türkiye, a country rich in wetlands in its region, this richness is due to the presence of different types of wetlands (Akalın and Kan, 2023). After Türkiye became a party to the "Convention on Wetlands," signed in 1971 in Ramsar, Iran, in 1994, the agreement entered into force after being published in the Official Gazette dated 17.05.1994 and numbered 21937. The necessary legal steps have started to be taken for the protection and sustainability of wetlands in accordance with the spirit of the convention. In Türkiye, legislative provisions are prepared and implemented by the legislator to protect wetlands (Akalın and Kan, 2023). despite all these legal regulations, some wetlands in Türkiye are still being destroyed because of the negative effects of climate change, as well as excessive agricultural activities, including incorrect irrigation, drying, etc. (Özdemir, 2005; WWF, 2008; Aküzüm *et al*., 2010).

The aim of this study was to measure the environmental attitudes of producers engaged in agricultural activities in Seyfe Lake Wetland, which is located in Kırşehir province, Türkiye, and covers 10,700 hectares. The wetland was included in the Ramsar Convention list in 1994. The study used the New Environmental Paradigm Scale to reveal the relationship between wetland management and agricultural activities in the region by determining the issues affecting the environmental attitudes of producers. Thus, by determining the views of the producers on the Seyfe Lake Wetland, a more effective plan for the existing wetland management can be developed.

2. Materials and methods

The main material of the study consisted of primary data obtained from face-to-face questionnaire completion, showing the levels of agricultural activities and environmental attitudes of producers in the agricultural sector around Seyfe Lake. The research was conducted in 6 villages (Kızıldağyeniyapan, Gümüşkümbet, Yazıkınık, Seyfe, Eskidoğanlı, and Budak) bordering the Seyfe Lake Irrigated Area of the Mucur district of the Kırşehir province (**Figure 1**).

The six villages included in the research that have borders with Seyfe Lake Wetland, and there are 1,539 producers registered in the Farmer Registration System of the Ministry of Agriculture and Forestry in these villages. In the villages, 119 producers with land within the Seyfe Lake Wetland were purposively selected to represent both the village, and the region, and a face-to-face survey was conducted with these producers in July-August 2023.

Farmers were required to engage in agricultural production activities within the Seyfe Wetland.

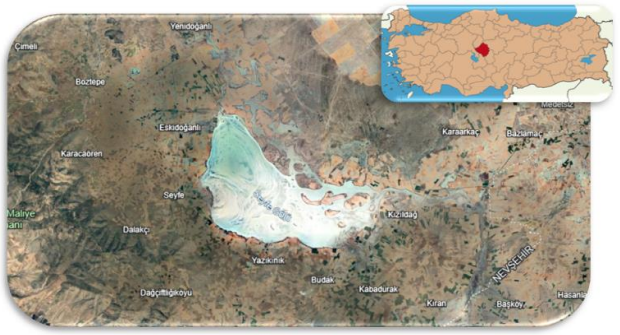

Figure 1. Seyfe Lake and Seyfe Wetland map in Kırşehir-Türkiye (Google Earth, 2024)

In the study, the New Environmental Paradigm Scale (NEPS) (Dunlap and Van Liere, 1978; Dunlap *et al*., 2000; Cordano *et al*., 2003; Hunter and Rinner, 2004), was used to determine the environmental attitudes and sensitivity levels of farmers. The statements used in this study are listed in **Table 1**. In the implementation phase, farmers were presented with the statements required by the method and were asked whether they agreed or disagreed with each statement. Environmental attitudes were then determined based on the responses to the 15 statements. In the evaluation, a 5-point Likert scale was used.

Table 1. The New Ecological Paradigm Scale

No	The New Ecological Paradigm Scale	Codes
1	We are approaching the limit of the number of people the earth can support	NEPS_1
2	Humans have the right to modify the natural environment to suit their needs	NEPS_2
3	When humans interfere with nature it often produces disastrous consequences	NEPS_3
4	Human ingenuity will insure that we do NOT make the earth unlivable	NEPS_4
5	Humans are severely abusing the environment	NEPS_5
6	The earth has plenty of natural resources if we just learn how to develop them	NEPS_6
7	Plants and animals have as much right as humans to exist	NEPS_7
8	The balance of nature is strong enough to cope with the impacts of modern industrial nations	NEPS_8
9	Despite our special abilities humans are still subject to the laws of nature	NEPS_9
10	The so-called “ecological crisis” facing humankind has been greatly exaggerated	NEPS_10
11	The earth is like a spaceship with very limited room and resources	NEPS_11
12	Humans were meant to rule over the rest of nature	NEPS_12
13	The balance of nature is very delicate and easily upset	NEPS_13
14	Humans will eventually learn enough about how nature works to be able to control it	NEPS_14
15	If things continue on their present course, we will soon experience a major ecological catastrophe	NEPS_15

Source: *Dunlap et al., 2000*

Table 2. Socio-demographic characteristics of producers

Variables	Mean	%
Age (Year)	53.35	
Education Level		
Illiterate		0.00
Primary School		15.13
Secondary School		29.41
High School		41.18
Vocational School		8.40
University		5.88
The Number of Household Member (Head)	3.65	
Cultivated Area (Ha)	29.94	
Owned Area (Ha)	22.98	
Rented Area (Ha)	4.54	
Shared Area (Ha)	2.42	
Irrigated Area (Ha)	5.80	
Subjective Poverty Levels		
Poor		0.00
Mid-Poor		18.49
Mid-Good		67.23
Good		14.29
Risk State		
Risk Lower		49.58
Risk Neutral		9.24
Risk Averse		41.18

Factor analysis was conducted to reveal the main factors determining the environmental attitudes of the producers in the region. Factor analysis refers to a group of procedures used for data reduction or summarization (Sharma 1996, Malhotra 1996, Hair *et al*. 1998). In research, there may be many variables and many of them may be interrelated. These may need to be reduced to make them useful. The relationships among many sets of variables can be examined by considering a few important factors.

In factor analysis, mutually independent relationships are examined. For factor analysis to be appropriate, there must be a correlation between variables. If the correlation between variables is small, factor analysis may not be appropriate. In this case, the suitability of the factor model should be tested. Bartlett's test, used for this purpose, examines the hypothesis that there is no correlation between the variables in the population.

Another is the Kaiser-Meyer-Olkin (KMO) test. It is an index used to examine the appropriateness of factor analysis. High values (between 0.5 and 1), indicate that factor analysis is appropriate. For values below 0.5, factor analysis is not appropriate. In this study, principal components, one of the factor analysis approaches, were used. In this approach, the total variance in the data set is taken into account. Principal components analysis is recommended when determining the minimum number of factors that will take into account the maximum variance in the data. Eigenvalues were used to determine the number of factors. The eigenvalue indicates the total variance explained by each factor. In this approach, only factors with eigenvalues greater than 1 are considered, and other factors are not included in the model.

Factor groups, obtained using factor analysis, determining environmental attitudes were used as variables in cluster analysis. A variable representing each factor group was used in grouping the farmers. While determining the variables representing the factor groups, the variable with the highest value in each group in the component matrix was considered.

Cluster analysis is a method used to group observations into clusters (Sharma 1996, Malhotra 1996, Hair *et al*. 1998). Its aim is to group observations into clusters that are as homogeneous as possible depending on the variables considered. This technique groups observations or objects (answers, people, opinions, thoughts, etc.) into clusters that are closest to each other according to a predetermined criterion or criteria. Cluster analysis does not distinguish between dependent and independent variables. In this analysis technique, independent relationships between all variables are examined. Cluster analysis can be used as a general data reduction method.

In this study, hierarchical clustering was utilized. Hierarchical methods can be classified into two types: agglomerative, and divisive. Agglomerative clustering, which is utilized in the research, initially considers each observation as a distinct cluster. Agglomerative clustering was performed using the variance method. In this method, intra-cluster variance is minimized. The most widely used variance method is Ward's method. In Ward's method, clusters are formed by maximizing the homogeneity within the cluster. A dendrogram was used to determine the number of clusters. As a result of the clustering analysis considering the factors determining the environmental attitude in the region, the producers were divided into three groups.

Chi-Square Analysis was used to determine the relationship between the cluster groups formed according to the environmental attitudes of the producers in the research region, and their behaviors toward Seyfe Lake Wetland. The chi-square test is a statistical test used to analyze categorical data and assess the independence or association between variables (Greenwood and Niculin, 1996). The Likert scale was used to evaluate the producers' environmental attitudes, environmental thoughts, behaviors, and opinions on other issues (Malhotra, 1996).

3. Results and discussion

Seyfe Lake is located in the Central Kızılırmak Section of the Central Anatolia Region. It is located between 39° 26''15"-39° 05' 00" north latitude and 34° 12''36"-34° 36''00" east longitude. Its height above sea level is 1110 m. The lake takes its name from Seyfe village in the west. There are a total of six villages around the lake: Seyfe, Gümüşkümbet, Yazıkınık, Budak, Kızıldağ, and Eskidoğanlı. There are approximately 45 km² of swampy areas around Seyfe Lake. Therefore, most of the lake shores are muddy and flat. In the west and southwest of the basin, there are deposition fans in large areas between Seyfe and Gümüşkümbet villages. These accumulation fans are used as agricultural areas. The waters of Seyfe Spring, which has the highest flow rate feeding the lake, are used for the irrigation of the surrounding agricultural areas and as drinking water. There are poplar and willowy areas around the spring and on the western shores. In the north of the lake, there are large steppe areas, extending to the shore of the lake. The other shores are generally surrounded by fields (Tapan, 2008). The area where Lake Seyfe is located is a closed basin. This closed basin is located in a fold system; metamorphic and sedimentary units are widespread in the basin, while igneous units surface in a very narrow area (Çiftçi, 2013)

The main livelihood for people around the lake is agriculture and animal husbandry. Ninety percent of the people make a living in this way. Dry agriculture is practiced in 91.7% of the basin, and irrigated agriculture is practiced in 8.3%. The main crops cultivated are wheat, sugar beet, barley, lentils, chickpeas, beans, oats, and sunflower. Fruit and vineyard cultivation is also practiced to a lesser extent. The large area of pasture in the basin has brought pasture animal husbandry to the forefront. Overgrazing causes the pastures to deteriorate and lose their functions (Çiftçi, 2013)

People living around Seyfe Lake benefit from the lake as a source of life and socio-economic development, both providing water for irrigation in agriculture and for drinking. Seyfe Lake is the most important natural resource that provides the essential resources for the

development of the local people. In addition, Seyfe Lake has scientific, cultural and historical richness in terms of biodiversity and habitat of water birds. The lake area was declared a Grade 1 Natural Protected Area in 1989 and a Nature Conservation Area in 1990. In 1994, Türkiye became a party to the Ramsar Convention (Protection of Wetlands of International Importance Waterfowl Habitat), and the lake was included in the Ramsar Convention. Seyfe Lake, which has an ecosystem in which fresh and saltwater ecosystems are rarely found together and is located on bird migration routes, has been included in the Ramsar Convention because it is a wetland of international importance, especially for waterfowl, and the protection of the natural and ecological character of the area has been ensured at the international level (Kıymaz, 2010).

In this study conducted with 119 producers in six villages bordering the Seyfe Lake Wetland, some socio-demographic characteristics of the interviewed producers are presented in **Table 2**. The average age of the interviewed producers is over 50 years and they mostly have primary, secondary, and high school education levels. The average household size is 3.65, and the subjective poverty level of the families is considered moderate. Almost half of the producers are risk-loving, and this is an positive indicator in the process of adopting innovations. Kıymaz and Karadavut (2014) in their study conducted in the region, stated that the average age of the producers was 53.6, the average household size was 5.5, and that a significant portion of the producers were retired people. Similar results have been reached in this study and previous studies.

In this section, the averages of the answers given by the farmers in the research region are evaluated. These answers reflect whether the farmers agree or disagree with each statement considered as a variable in the NEPS. Firstly, the statements where the degree of agreement of the farmers is "expected to be high" are analyzed, and then the statements where the degree of agreement is "expected to be low" are analyzed. The results can be seen in **Figure 2** and **Figure 3**.

When the statements with high level of agreement on environmental awareness were evaluated, the three statements with the highest level of agreement were "NEPS_7-Plants and animals have as much right as humans to exist", "NEPS_1- We are approaching the limit of the number of people the earth can support", and "NEPS_15- If things continue on their present course, we will soon experience a major ecological catastrophe". The results of the study are very similar to the results obtained from the study conducted by Günden and Miran (2008) in the Torbalı district of the İzmir province. In addition to this, the participants agreed with the statement "NEPS_11, The earth is like a spaceship with very limited room and resources" below average levels. A general evaluation shows that the participation in the 8 statements with the highest level of agreement is slightly above average (**Figure 2**). This is not a strong indicator of the environmental attitudes of the producers engaged in agricultural activities in the region.

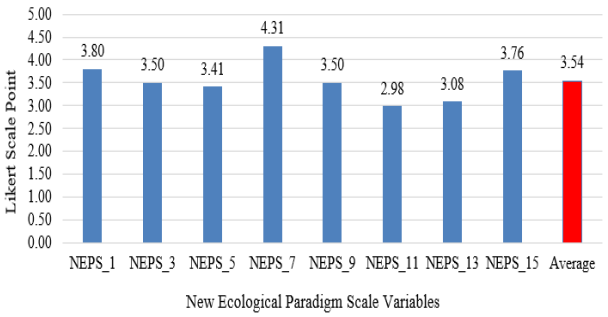

Figure 2. Statements expected to have a high degree of agreement in in the study area (5 to 1)

When the 7 statements expected to have a low level of agreement on environmental sensitivity are evaluated, the statements "NEPS_4- Human ingenuity will ensure that we do not make the earth's unlivable" and "NEPS_2- Humans have the right to modify the natural environment to suit their needs" showed low agreement as expected. In addition to this, the fact that 3 out of 7 statements are above average indicates a negative trend in terms of the environmental attitudes of the producers. The high level of participation in the statement that reads "NEPS_6- The earth has plenty of natural resources if we just learn how to develop them" shows that the producers are not sufficiently concerned about natural resources (Figure 3). Günden and Miran (2008) obtained similar results in their study conducted in Torbalı district of Izmir province, and found that the participation of producers in NEPS_6 was also high there.

A farmer's environmental attitude is calculated by averaging his/her responses to 15 variables. Therefore, attitude values are between 1 and 5. A value close to one indicates that the farmer does not care about the environment. A value close to five indicates that the farmer cares about the environment and is an environmentalist.

The environmental attitude variable is used as a continuous variable in the analysis. When the farmers of the research region were evaluated in general, the average environmental attitude in the region was found to be 3.32. We conclude that the farmers in the region care about the natural environment to a moderate degree. For the variables for which high participation was expected (**Figure 2**), the average was 3.54. Farmers agree with these statements to a moderate extent. For the variables where low agreement was expected (**Figure 2**), the research area average was 3.05. The fact that farmers have an above-average level of agreement for the statements that they are expected to disagree on shows that they have a low environmental attitude (**Table 3**). In the study conducted by Kıymaz and Karadavut (2014) in the region, producers stated that they were aware of the value of Seyfe Lake Wetland, but they were unaware of the management plan. Another important finding is that the producers are aware of the loss of biodiversity in the region over the years. The most important factor in this loss was shown to be the decrease in the water level in the lake. The results of the research show that the producers in the region are aware that the Seyfe Lake

Wetland is in danger, but the reason for this is the lack of effective management and institutional capacity. However, most of the producers seeing this wetland as a resource for their agricultural activities is also an indicator of a one-way relationship. In the study conducted by Doğan and Karaaslan (2022) in the region, producers benefited from the Protection of Agricultural Lands for Environmental Purposes (ÇATAK) support program before 2019. However, 56.00% of the producers stated that they did not know the meaning and content of the supports. This is another indicator of a low attitude towards the environment in the region.

In this part of the research, the factors determining the environmental attitudes of producers in the region are revealed using factor analysis. The variables considered were the "New Environmental Paradigm" process developed to examine the environmental attitudes of individuals. Second, the sample size should be at least four or five times the number of variables available. In this study, data obtained from 119 producers, using a likert scale for 15 variables, were used. In the factor analysis, the hypothesis that "the population correlation matrix is a unit matrix" is rejected (Bartlett's Test of Sphericity: 515.208). In addition, the value of the Kaiser–Meyer Olkin (KMO) statistic is greater than 0.5 (KMO: 0.647). Based on these results, it can be concluded that the factor analysis is appropriate for this study.

Four factors, explaining 58.80% of the variability, were found to determine the environmental attitudes of farmers in the study area (**Table 4**). The first factor was named as "Ecological Catastrophe." The ecological risks that may occur as a result of human activities are mostly included in this group. This factor explains the highest proportion of variance. The second factor was named "Ecological Limits". Here, it is emphasized that our resources are limited and that we should pay attention to the balance of nature while using these limited resources. The third factor is called "Balance of Nature." It emphasizes the power of the balance of nature and that humans are a part of this balance. The fourth factor is called "Human Domination." Here, there are explanations for the impact of humans on nature (**Table 4**).

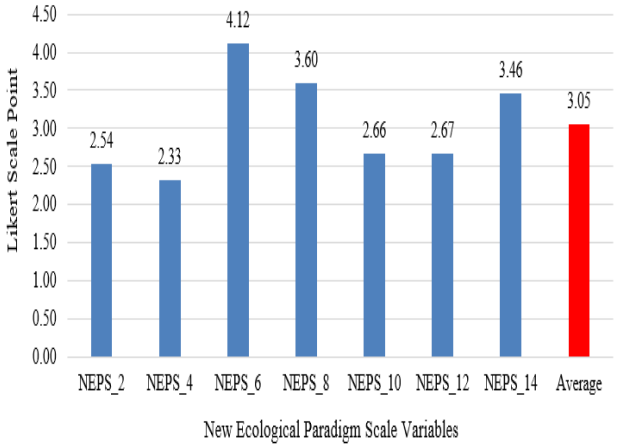

Figure 3. Statements expected to have a low level of agreement in the study area (1 to 5)

Table 3. Environmental attitudes of farmers in the research area

	Mean	Minimum	Maximum	St. Dev.
Environmental Attitude	3.32	2.13	4.40	0.40
High Participation Expected	3.55	1.63	5.00	0.58
Low Participation Expected	3.05	2.00	4.57	0.48

Table 4. Factors determining the environmental attitude of farmers in the research area

Group Names	Variables	Factors and Factors Loading			
		1. Factor	2. Factor	3. Factor	4. Factor
Ecological Catastrophe	NEPS_3	0.704			
	NEPS_2	-0.676			
	NEPS_1	0.672			
	NEPS_4	-0.584			
	NEPS_10	-0.566			
	NEPS_5	0.412			
Ecological Limits	NEPS_14		0.834		
	NEPS_11		0.790		
	NEPS_13		0.775		
	NEPS_15		0.598		
Balance of Nature	NEPS_8			0.810	
	NEPS_9			0.787	
Human Domination	NEPS_7				0.792
	NEPS_6				0.670
	NEPS_12				-0.521
% of Variance (58.800%)	20.047%	18.507%	12.149%	8.098%	
Bartlett's Test of Sphericity	515.208				
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy.	0.647				

In this part of the study, farmers were grouped using the results of factor analysis. For this purpose, cluster analysis was conducted considering the factors determining the environmental attitudes of the local farmers. According to the results of the clustering analysis, farmers in the research region were found to be divided into three groups in terms of environmental attitudes. The largest proportion of farmers is in the first group with 56.30% (**Table 5**).

The means and profiling of the attitudinal variables considered for the interpretation and profiling of the groups are presented in **Table 6**. When the averages of the variables constituting the first factor group, which had the highest level of influence in determining environmental attitudes, were examined, there were statistically significant differences between the clusters. Clusters 1 and 2 showed more sensitivity in terms of "Ecological Catastrophe" than Cluster 3. While producers in Clusters 1 and 2 are more sensitive to positive statements, those in Cluster 3 are more sensitive to negative statements. Regarding "Ecological Limits", it was determined that the individuals in Cluster 3 showed less sensitivity than those in Clusters 1 and 2. Thus, the sensitivity of Cluster 2 was higher. While there is a statistically significant difference between the variables on "Balance of Nature", producers in cluster 1 and 2 show sensitivity in negative statements and producers in cluster 3 show sensitivity in positive statements. Regarding "Human Domination", there is no statistical difference between the clusters for the variable "NEPS_12- Humans were meant to rule over the rest of nature", but as expected, low scores were given.

While there is a statistical difference between the clusters according to the other variables, it can be said that the environmental attitudes of the producers in clusters 1 and 2 in the variable expected to be scored negatively, and in cluster 3 in the variable expected to be scored positively, are better. In general, it can be said that the producers in clusters 1 and 2 have higher environmental attitude scale scores than those in cluster 3 in terms of environmental attitude score (**Table 6**).

According to the clusters obtained, producers' opinions about Seyfe Lake Wetland are presented in **Table 7**. When the table is examined, it can be seen that there are statistically significant differences on 2 issues according to the cluster groups. These are that the producers in Cluster 1 and 2 are more aware of the management of Seyfe Lake Wetland than the producers in Cluster 3 and that the producers in Cluster 1 are more sensitive to the fact that there will be a significant loss in biodiversity if Seyfe Lake Wetland is destroyed. In the rest of the issues, it can be said that the producers gave similar answers to each other. This situation reveals another problem. In particular, it has been determined that the producers attribute the primary responsibility for the protection of Seyfe Lake Wetland to the state and avoid individual responsibility. In fact, the rate of producers stating that this wetland harms the agricultural activities of the producers and that the loss of this wetland will not have a negative impact on household livelihoods and income is more than half. Although there is an opinion that the loss of the wetland will create an environmental problem, this opinion is not dominant enough. In the Seyfe Lake Wetland, the use of the resources that feed the lake for drinking and irrigation water purposes, and the drainage canals opened to prevent the feeding of the lake have been one of the important factors in the decrease in the lake level over the years (Çiftçi *et al*., 2021).

4. Conclusions

Seyfe Lake Wetland is protected under the RAMSAR Convention to which Türkiye is a party, and constitutes one of the rare areas of Türkiye with its biodiversity. Seyfe Lake, which is the only wetland within the borders of Kırşehir Province, is among Türkiye's "A" Class Wetlands. The protection of such areas, which are one of the only elements of our future, is not possible solely through public order. Local people who interact with such areas have the primary responsibility for protecting and ensuring the sustainability of these areas. Therefore, management plans for these areas must be multidimensional and participatory. Otherwise, unilateral plans invite failure rather than success. Unfortunately, the processes currently experienced regarding Seyfe Lake Wetland have caused this area to face the danger of damaging and even extinction.

The results of this research showed that the environmental attitudes of the people living in this wetland were inadequate. In the interviews, the village residents prioritized their own livelihood problems and demanded that existing prohibitions be lifted. Opening this area to more irrigation, licensing new wells, and eliminating water restrictions in existing wells are among the demands being made. In some villages, the local people have been informed that the use of illegal wells has increased, mainly due to economic concerns. Additionally, those with legal wells do not comply with irrigation quotas sell water to their field neighbors at exorbitant prices during periods when they do not plant a crop that requires irrigation or leave it fallow.

A high level of interest and motives for protection are only possible if there is a positive relationship between these areas and their inhabitants.

Table 5. Farmer groups according to environmental attitude in the research area

Groups	Frequency	Percent
1. Group	67	56.30
2. Group	30	25.21
3. Group	22	18.49
Total	119	100.00

Table 6. Average attitudinal variables according to farmer groups in the research region

Group Names	Variables	1	2	3	Average	F Value
Ecological Catastrophe	NEPS_3	3.87a	2.67b	3.55a	3.50	13.118***
	NEPS_2	2.36b	3.33a	2.00b	2.54	12.459***
	NEPS_1	4.06a	2.97b	4.14a	3.80	18.079***
	NEPS_4	2.07b	3.10a	2.05b	2.33	13.574***
	NEPS_10	2.42b	3.07a	2.86ab	2.66	4.281**
	NEPS_5	3.61a	3.30ab	2.95b	3.41	3.925**
Ecological Limits	NEPS_14	3.46b	3.97a	2.77c	3.46	10.990**
	NEPS_11	3.15a	3.60a	1.64b	2.98	25.528***
	NEPS_13	3.43a	3.40a	1.59b	3.08	35.277***
	NEPS_15	3.81ab	3.97a	3.36b	3.76	2.513*
Balance of Nature	NEPS_8	3.28b	3.70b	4.41a	3.60	9.759***
	NEPS_9	3.37b	3.37b	4.05a	3.50	4.164**
Human Domination	NEPS_6	3.91b	4.03b	4.86a	4.12	12.885***
	NEPS_7	4.06c	4.40b	4.95a	4.31	21.930***
	NEPS_12	2.66	2.83	2.50	2.67	0.605
Environmental Attitude	3.30ab	3.45a	3.18b	3.32	3.085**	

*Statisticaly significant at *90%, **95%, ***99% confidence levels*

Table 7. Producers' views on the protection and sustainability of Seyfe Lake Wetland according to their environmental attitudes

Variables	1	2	3	Average	Chi Square
I Have Sufficient Knowledge About Seyfe Lake Wetland Management	Never Agree	8.96	0.00	0.00	5.04	13.340**
	Don't Agree	19.40	6.67	13.64	15.13	
	Uncertain	41.79	70.00	72.73	54.62	
	Agree	29.85	23.33	13.64	25.21	
	Absolutely Agree	0.00	0.00	0.00	0.00	
I Find the Activites for the Protection of Seyfe Lake Wetland Sufficient	Never Agree	11.94	3.33	4.55	8.40	4.930
	Don't Agree	19.40	16.67	18.18	18.49	
	Uncertain	62.69	73.33	77.27	68.07	
	Agree	4.48	3.33	0.00	3.36	
	Absolutely Agree	1.49	3.33	0.00	1.68	
Our Agricultural Activities in Seyfe Lake Wetland are Negatively Affected	Never Agree	7.46	6.67	4.55	6.72	10.002
	Don't Agree	7.46	3.33	13.64	7.56	
	Uncertain	22.39	40.00	36.36	29.41	
	Agree	22.39	33.33	22.73	25.21	
	Absolutely Agree	40.30	16.67	22.73	31.09	
I think Seyfe Lake Wetland Management is Adequate.	Never Agree	4.48	0.00	4.55	3.36	11.250
	Don't Agree	20.90	13.33	18.18	18.49	
	Uncertain	70.15	66.67	77.27	70.59	
	Agree	2.99	16.67	0.00	5.88	
	Absolutely Agree	1.49	3.33	0.00	1.68	
Destruction/Damage of Seyfe Lake Wetland Causes Loss of Biological Diversity	Never Agree	0.00	3.33	0.00	0.84	16.441**
	Don't Agree	4.48	16.67	22.73	10.92	
	Uncertain	34.33	50.00	45.45	40.34	
	Agree	47.76	23.33	22.73	36.97	
	Absolutely Agree	13.43	6.67	9.09	10.92	
Destruction/Damage of Seyfe Lake Wetland is an Important Environmental Problem	Never Agree	0.00	0.00	0.00	0.00	10.408
	Don't Agree	5.97	20.69	18.18	11.86	
	Uncertain	41.79	37.93	59.09	44.07	
	Agree	40.30	34.48	22.73	35.59	
	Absolutely Agree	11.94	6.90	0.00	8.47	
Destruction/Damage of Seyfe Lake Wetland Negatively Affects Our Agricultural Activities	Never Agree	28.36	23.33	31.82	27.73	7.393
	Don't Agree	40.30	30.00	45.45	38.66	
	Uncertain	14.93	20.00	13.64	15.97	
	Agree	8.96	23.33	9.09	12.61	
	Absolutely Agree	7.46	3.33	0.00	5.04	
The Primary Responsibility for the Protection of Seyfe Lake Wetland Lies With the Public (State Institutions)	Never Agree	0.00	3.33	0.00	0.84	9.601
	Don't Agree	4.48	0.00	0.00	2.52	
	Uncertain	8.96	20.00	13.64	12.61	
	Agree	64.18	60.00	77.27	65.55	
	Absolutely Agree	22.39	16.67	9.09	18.49	
We Have Individual Responsibility for the Protection of Seyfe Lake Wetland	Never Agree	4.48	0.00	4.55	3.36	5.337
	Don't Agree	5.97	6.67	0.00	5.04	
	Uncertain	64.18	60.00	77.27	65.55	
	Agree	20.90	30.00	18.18	22.69	
	Absolutely Agree	4.48	3.33	0.00	3.36	
Drying Up/Damage to Seyfe Lake Wetland Would Have A Negative Impact On Livelihoods And Income in This Area	Never Agree	23.88	16.67	22.73	21.85	9.688
	Don't Agree	41.79	30.00	36.36	37.82	
	Uncertain	7.46	26.67	27.27	15.97	
	Agree	13.43	13.33	9.09	12.61	
	Absolutely Agree	13.43	13.33	4.55	11.76	
The Fact That Our Lands are Located in the Seyfe Lake Wetland Causes a Decrease in Our Income	Never Agree	1.49	6.67	0.00	2.52	8.642
	Don't Agree	2.99	6.67	0.00	3.36	
	Uncertain	10.45	13.33	22.73	13.45	
	Agree	25.37	33.33	22.73	26.89	
	Absolutely Agree	59.70	40.00	54.55	53.78	
The Diversity of the Products We Produce on our Lands in The Seyfe Lake Wetland is Limited	Never Agree	1.49	3.33	0.00	1.68	6.139
	Don't Agree	1.49	3.33	0.00	1.68	
	Uncertain	29.85	20.00	18.18	25.21	
	Agree	43.28	46.67	36.36	42.86	
	Absolutely Agree	23.88	26.67	45.45	28.57	

*Statisticaly significant at *90%, **95%, ***99% confidence levels*

Nature has always prevailed in the long run due to its ability to adapt to competitive environments. The results of the interviews with producers engaged in agricultural activities in the region indicate the existence of this competition. Reasons such as the withdrawal of water from the region using deep wells, although forbidden, and the failure to achieve the desired success despite management plans have caused the Seyfe Lake Wetland to face the danger of drying up. Additionally, the local population perceives wetland management and protection as the state's responsibility and views the wetland's existence as negatively affects their livelihood and income. Furthermore, the lack of precipitation in recent years due to climate change effects have caused the Seyfe Lake Wetland to face the danger of drying up. This situation has been repeatedly mentioned in previous studies (Kıymaz, 2010; Çiftçi *et al*., 2021). In addition, failures in the management of the Seyfe Lake Wetland triggered this situation. In the report prepared by the Ahiler Development Agency in 2016, this failure was attributed to the fact that the planning, implementation, and monitoring stages in Türkiye were disconnected from each other and could not be realized in an integrated manner. The fact that the organizations responsible for the planning work and the organizations responsible for the implementation, are often within different institutional structures is one of the factors in the formation of this problem (AHİKA, 2016).

Although the "Environmental Agricultural Land Protection Program (ÇATAK)," which was implemented in Türkiye between 2006-2019, was, at least, a tool to prevent income losses of people living in such areas, the fact that these practices have been abolished today is seen as another issue. However, the fact that there were also problems in the results of previously applied ÇATAK applications in the region revealed that, not only the support mechanism but also the awareness of the producers should be raised when making such applications. Doğan and Karaaslan (2022) determined that 56.00% of the producers did not know the meaning and content of the ÇATAK supports' they benefited from in their study around Seyfe Lake. In fact, Olhan *et al*. (2010) stated in their study that the success of ÇATAK supports, which started in 2006, is made possible by informing and educating the producers about the correct use of inputs in agricultural production. Nevertheless, the fact that inappropriate practices have had an impact on the damage and drying out of the Seyfe Lake Wetland is an indication that not enough measures have been taken in this regard.

Interviews with the producers revealed that the unprofitability of the production pattern, which includes a limited number of products restricted to the dry farming system, compelled the producers to compete with the wetland. This situation results from both the producers' lack of knowledge and the absence of innovation by the institutions and organizations that direct agriculture in the region. Wetlands are an important source of biodiversity for Türkiye. The protection of these areas is also important for safeguarding our genetic resources. For this reason, in addition to different plant species suitable for the region, it is important for the sustainability of these areas to implement activities that can provide shared benefits for the wetlands in the region, and to design support models specific to the region. Establishing a sustainable wetland management model involving local people can be seen as the first step. In addition, preventing unofficial practices in the region and preventing the producers from being harmed while doing this are other steps that should be taken. Another issue that should be taken into account in the production planning model being implemented in Türkiye is considering such wetlands.

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