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Sustainability of Kuru Lake (Sivas-Türkiye): Perspective Views and Way Forward

Seher Dirican[1,a*]

[1] *Department of Biology, Faculty of Science, Sivas Cumhuriyet University, Sivas, Türkiye*
**Correspondingauthor*

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ABSTRACT

Environmental problems, which are dependent on many variables, are a common and important issue for most countries in the world. In this study, the importance, current situation and sustainable use of Kuru Lake, which is a strictly sensitive area to be protected in the Sivas province of Türkiye, has been evaluated. Kuru Lake is a remarkable area with its untouched nature, vegetation, wildlife features and its scenic beauty. It is within the borders of Sivas province of Türkiye, approximately 20 km from the Hafik district centre. Kuru Lake, which is very valuable due to its natural texture, was declared and registered as a sensitive area to be protected with the official decision taken in December 2020. Kuru Lake's location and other natural features are vital to the ecosystem of a large area. Therefore, the area of 209.48 hectares in and around Kuru Lake has been included in the category of sensitive area to be strictly protected. In order to protect this natural wonder wetland and transfer it to future generations, protection measures should be taken and its sustainable use should be ensured. Kuru Lake should be protected and managed in a way that will protect its natural landscape integrity, historical values, vegetation and wild animals, and ensure that local people benefit. In the management of natural areas such as Kuru Lake, the understanding of sustainability should come to the fore. If the Kuru Lake is managed correctly, consciously and efficiently, the protection and sustainability of this wetland, which is a small part of a large ecosystem, in terms of natural balance can be ensured.

Keywords: Kuru Lake, nature conservation, protected area, sustainability

[a] *sdirican@cumhuriyet.edu.tr* *https://orcid.org/0000-0001-9130-5114*

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Introduction

Humans have been in a relationship with nature since their creation. Although this relationship is defined as a process in which humans affect nature and nature affects humans, the continuity of human existence is dependent on nature based on the relationship. Human's own needs and desires have been dominant in this relationship for a long time and those of nature have been ignored. As a result of the intense industrialization process that started with the industrial revolution and the urbanization and demographic problems triggered by this process, nature was rapidly destroyed, natural life was interrupted and many environmental problems such as the deterioration of the balance in nature have emerged (Aydın, 2021). The pressure exerted on natural ecosystems by the increase in industrialization, population and urbanization around the world requires more value to be placed on protected areas that provide vital ecosystem functions. Protected areas play a very important role in the continuation of the services and functions of these ecosystems, and they play a role for the benefit of people within their area, neighboring ecosystems and ultimately people all over the world (Çağlayankaya, 2022).

Conservation policies and practices regarding natural values are becoming increasingly universal, and many nature protection areas with different qualifications and statuses are determined and managed both based on countries and in line with various international agreements and conventions. In the evaluation made within the framework of nature protection legislation in Türkiye; Although the basic objectives of nature protection statuses are the same, the fact that their determination and announcement are based on different criteria, in addition to some basic "qualification and categorization" elements, the existence of scientific, technical and administrative differences in practice and the possession of areas with more than one protection status should be taken into account in both legislation and modeling studies. However, these statutes have been changed with the provisions of the "Regulation on the Procedures and Principles Regarding the Determination, Registration and Approval of Protected Areas" 6 put into effect within the framework of the duties and responsibilities determined by the Decree Law No. 644.

According to this regulation, "sensitive areas to be strictly protected" are divided into three categories as "qualified natural protection areas" and "sustainable protection and controlled use areas". In order to protect the "sensitive areas to be strictly protected", which is the first of these categories, the use of land and all impacts on the area have been limited. It is defined as areas that need absolute protection, where people are prevented from entering the area when necessary, and which will be protected by taking special precautions for scientific research, education or environmental monitoring, and a building ban will be imposed (Kaman and Aliefendioğlu, 2017).

This study was conducted to evaluate the importance, current situation and sustainable use of Kuru Lake, which is a strictly sensitive area to be protected in the Sivas province of Türkiye. It is thought that this study will help protect the natural values of the Kuru Lake and create an effective management model for its sustainable use.

Materials and Methods

Kuru Lake, which is a sensitive area to be strictly protected within the borders of the Hafik district of Sivas province, was determined as the study area. Kuru Lake is located in the Upper Kızılırmak Section of Anatolia. As a result of the researches carried out by the General Directorate of Mineral Research and Exploration, it was determined that the district of Hafik and its surroundings had a gypsum structure that occurred in many periods of the third geological period. Therefore, there are various depressions in this region. In the Hafik region, where karst landforms are common, many large and small lakes have been formed in the bowls formed as a result of melting. A continental climate prevails in the Hafik district, where the Kuru Lake is located. The climate of the area where Kuru Lake is located is influenced by a semi-arid rather cold climate. Winters are cold and harsh. Snowfall is generally observed in the winter season, and rain precipitation is observed in the spring season. While the most precipitation is observed in April-May, the least precipitation is observed in August. High temperatures are observed in the summer season with the effect of drought (URL-1, 2023). The general vegetation is meadows and steppes. Agriculture, animal husbandry and beekeeping are the most important agricultural activities in the region.

According to the Official Gazette (2012), sensitive areas to be strictly protected are; These are the areas where all effects on the area are limited and the use of land for the protection of resource values. The sensitive areas to be strictly protected should contain one or more of the following criteria. (1) They contain extraordinary ecosystems or species on a regional, national and world scale. (2) Its geological and geomorphological features have been preserved. (3) It has generally occurred without human influence. (4) There is a high risk of deterioration or destruction as a result of human activities. (5) The area does not include human activities that would conflict with its specific protection purposes. (6) It contains most of the local species that are expected to have an ecologically significant density. (7) It has characteristics that are important and do not require continuous intervention in order to achieve conservation goals. (8) Where necessary and possible, it is surrounded by land uses that will help the area achieve its designated conservation objectives. (9) It has manageability features with simple interventions. (10) It includes the breeding areas of the target species or species to be protected. These sensitive areas are strictly protected, although there is a definite construction ban, according to the evaluation to be made by the Regional Commissions regarding the nature, content and necessity of the activities; (1) Waste water, drinking water, natural gas and electricity lines can be constructed on condition that the existing road route is used in cases of necessity due to the public interest. (2) Facilities that are necessary for national security can be built. (3) Studies can be carried out to open forest fire roads, to maintain and repair forests, and to combat biotic pests and abiotic (fire, flood, storm) factors. (4) To ensure the continuity of the natural balance in the lagoon ecosystems, fishing activities can be carried out in line with the opinions of the relevant public institutions, provided that no structures are built, using traditional fishing methods arising from the characteristics of the area.

While determining the method in this study, the importance, current situation and sustainable use of the Kuru Lake, which was registered and declared as a sensitive area to be strictly protected by the Presidency of the Republic of Türkiye, were taken into consideration. In this study, firstly, previous studies on the subject were investigated. Later, the announcement date of the Kuru Lake, which is a sensitive area to be definitely protected, the surface area it covers, and other information about this area were collected and evaluated.

Results and Discussion

As a result of the evaluation of the protection status of the Kuru Lake Potential Natural Site within the borders of the Hafik district of Sivas province, it was decided to register and declare it as a sensitive area to be protected on 2 December 2020 following Article 109 of the Presidential Decree No. A total area of 209.48 hectares in and around Kuru Lake has been determined as a sensitive area to be protected (Table, 1). Kuru Lake has been determined as a sensitive area to be strictly protected with Slice Number ED50 6 Degree 37 (Official Gazette, 2020).

Table 1. Sensitive area to be strictly protected: Kuru Lake

Conservation Area Name	Province	District	Protected Area Slice Number	Declaration Date	Protected Area Size
Kuru Lake	Sivas	Hafik	ED50 6 Degree 37	02.12.2020	209.48 hectare

Kuru Lake is a strictly sensitive area to be protected in Sivas province in the Central Anatolia Region of Türkiye (Figure 1). Kuru Lake is approximately 50 kilometers from Sivas province and 20 kilometers from Hafik district. Kuru Lake is located within the borders of Gedikçayırı and Alçıören villages of Hafik district of Sivas province and near Ahmetuşağı village. The height of Kuru Lake above sea level is 1420 meters and the lake area is 100 hectares.

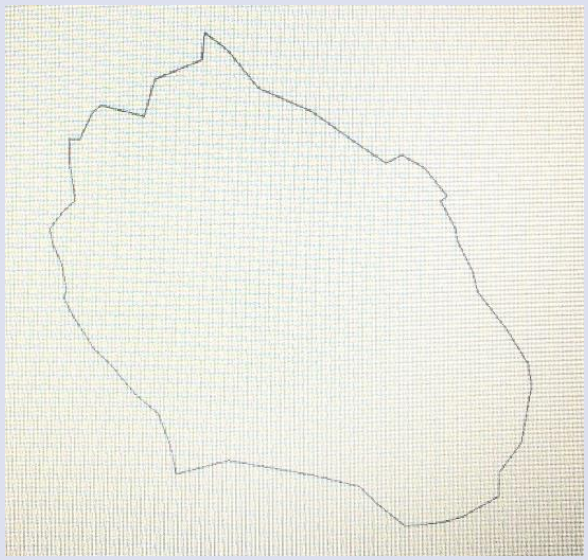

Figure 1. Kuru Lake

Kuru Lake is located in the Upper Kızılırmak River Basin. Since there are no settlements in its vicinity, Kuru Lake has remained away from human influence and has become an important aquatic ecosystem for waterfowl. Kuru Lake and its surrounding 20 hectares of marsh and reeds area offer breeding and sheltering opportunities for many native and migratory of wild animals. Migratory birds come to Kuru Lake in March, and migratory and native birds hatch and breed in the reeds in March, April, May and June. Following this breeding period, migratory birds pass the brood-rearing period in June, July, August and September and migrate at the end of September (SPEP, 2021). Plenty of cranes are observed in the Kuru Lake. In addition to cranes, the Kuru Lake provides feeding, shelter and breeding grounds for many species such as geese, ducks, shellducks, storks and herons. Therefore, Kuru Lake is a small bird sanctuary and hosts many different bird species. However, Kuru Lake is one of the rare places in Türkiye with its nature, vegetation with wildlife features and scenic beauty. Since the Kuru Lake is in a flat area and its surroundings are open, camouflage is a must in order to be able to observe. In addition, the abundance of empty bullets found near the Kuru Lake indicates hunter pressure. For this reason, it is very important to preserve the Kuru Lake and leave it to future generations.

Mutlu et al. (2013), in the study titled “Determination of Water Quality Parameters in Sivas - Kurugöl Lake”, reported that Kuru Lake varies between I-III class water quality following the parameters measured according to the classification of inland water resources. However, they determined that Kuru Lake is located on the gypsum plateau and its water is slightly salty, clear and odorless. As a result, they stated that Kuru Lake is under the pressure of pollution. Due to the intensive cultivation of the agricultural lands around the Kuru Lake, the mixing of the water entering the lake as a result of the surface flow from the agricultural lands should be prevented, and the inflow of water mixing into the lake from the livestock facilities in the vicinity should be prevented and necessary measures should be taken against the pollution caused by the picnickers around the lake. Due to the intensive cultivation of the agricultural lands around the Kuru Lake, the mixing of the waters entering the lake as a result of surface runoff from the agricultural lands should be prevented. The entry of water mixing into the lake from the livestock facilities located around the Kuru Lake should be prevented. In addition to these, Mutlu et al. (2013) offered suggestions such as necessary measures should be taken against the pollution caused by picnickers around Kuru Lake.

There is Kuru Göl village, which is located approximately 5 kilometers from Kuru Göl and bears the same name as Kuru Göl. According to the address-based population registration system in 2022, the total population of Kuru Göl village in the Hafik district of Sivas province is 33. Of this population, 17 are men and 16 are women. According to this, Kuru Göl village is in the countryside of Sivas province and its population density is very low. The average depth of Kuru Lake is around 2 meters. However, this depth varies considerably from year to year and between summer and winter seasons. Apart from geographical, topographic and human factors on the water level changes of Kuru Lake, climatic characteristics have also shown a great influence in recent years. Climate elements, which are an important element of the hydrological cycle of water in nature, cause a decrease in the water level of Kuru Lake. So much so that the water of Kuru Lake decreases enough to walk at the end of the summer season and at the beginning of the autumn season. Evaporation is one of the important factors affecting this situation in stagnant waters with a low depth such as Kuru Lake. Evaporation comes to the forefront for the sustainability of the Kuru Lake. Evaporation in Kuru Lake continues to increase starting from May and reaches its maximum value in August. Afforestation work can be planned to prevent or reduce evaporation in and around the Kuru Lake. When afforestation, species that are resistant to drought, low in water requirement and compatible with the soil structure of the land should be preferred.

There is no doubt that one of the main factors determining the geographical conditions of a region on Earth is how high that place is from the sea. Therefore, the concept of the altitude is a concept that determines the variables of existence and acceptance of a region. The altitude relative to the seas has sometimes presented threats and sometimes opportunities conjunctural in every period of history. However, there is

only one fact that does not change, and that is the fact that the altitude of an area deeply affects both the physical and human events of that area. Although the increase in altitude is mostly perceived as a threat, especially in terms of climate elements, this situation may appear as an opportunity in certain places of the world. In other words, it can be said that altitude affects and largely regulates human and human activities, population, settlement, transportation, shape and size of economic activity, tourism and many other activities. However, one of the most important factors forming and changing the socio-ecological structure of a region is undoubtedly the population. Of these, the absolute amount of the population, distribution by gender, growth rate, being urban or rural, distribution according to age groups, education level and similar features are important determinants of the planning studies for the restructuring and development of the region (Alaeddinoğlu, 2014). In this context, it has been determined that the settlements and the numerical size of the population around Kuru Lake, which is the subject of the research, are quite low depending on their altitude from the sea. This situation creates an advantage in terms of protecting the natural structure and wildlife of Kuru Lake.

Kuru Lake, the natural wonder of Sivas province, which has been registered and declared as a strictly sensitive area that needs to be protected, has been particularly affected by drought in recent years. Kuru Lake, which has a natural beauty, is in danger of drying up due to the increasing climate change in recent years and the decrease in snow and rain precipitation. Birds nesting in Kuru Lake, which is about to dry out due to the dry seasons in the autumn and winter of 2021, migrated and the view of the dried lake made the residents of the region uneasy. However, with the arrival of the spring season and the melting of the snow, the first guests of the lake, which flooded again, were cranes (SPEP, 2021). Kuru Lake is an important accommodation, feeding and breeding area for many different bird species. If the Kuru Lake, which is of vital importance for the birds, dries up completely, it will cause the migration routes of the birds coming to the lake to change. Kuru Lake is important not only for birds but also for agriculture and animal husbandry, which are an important source of livelihood in the region. Because Kuru Lake is one of the important points where the accommodation and water needs of animals are met. For this reason, the strictly sensitive area of Kuru Lake to be protected is of vital importance for all living things. Kuru Lake is one of the rare wetlands that has largely preserved its wildlife habitat. In Kuru Lake, which is a natural wonder, which has been registered as an area that needs to be protected, its natural structure will be better preserved, since irregular hunting cannot be carried out with this conservation decision.

Protected areas are one of the most important elements of both national and international nature conservation efforts. These areas have vital functions in the protection of biological diversity, and natural and cultural resources, as they impose restrictions on human use by using legal and administrative tools. The fulfillment of these functions of protected areas, which have environmental, socio-economic and cultural functions, depends on their effective management (Çağlayankaya, 2022). Protected areas are areas with biological diversity and ecosystems that are important for conservation. These areas provide many direct or indirect benefits to the geography and region where they are located (Eroğlu, 2022). In the understanding of sustainable development, the damage to the environment has been tried to be minimized and the sustainability of environmental elements has been the main goal. (Aydın, 2021). To contribute to the country's economy, protected areas can be used for tourism and recreation purposes, when necessary and the right areas can be selected, by making appropriate planning studies, and more importantly, by considering the protection-utilization balance. Protected areas need to be carefully planned, managed and monitored to ensure long-term sustainability. To protect natural and cultural values in the long term, an ecologically based planning approach should be applied and a comprehensive inventory of the area should be drawn up by the relevant disciplines. It is important to ensure the participation of the local people in every stage of the planning and protection works to be carried out in Kuru Lake. To ensure the support and participation of local people in conservation studies, training and information programs should be implemented for local people and users.

Conclusion

Kuru Lake's location and other natural features are vital to the ecosystem of a large area. Therefore, the total area of 209.48 hectares in and around Kuru Lake has been taken under protection in the category of sensitive area to be strictly protected. Various birds coming to Kuru Lake use this wetland as accommodation, feeding and breeding grounds. For this reason, Kuru Lake is also important in terms of zoogeography. Kuru Lake, which has a natural beauty, is faced with the danger of drying out due to the decrease in precipitation and high evaporation due to the change in climate in recent years. As a result, the protection and sustainable use of Kuru Lake, which is one of the important values and sensitive areas to be strictly protected, should be ensured in Türkiye and Sivas province. Conservation measures should be taken and implemented to protect this marvelous wetland and transfer it to future generations. If the natural resources of the ecological structure of Kuru Lake are used correctly, consciously and efficiently with a proactive approach, this wetland, which is a small part of a large ecosystem, will be protected in terms of natural balance. In addition, the promotion and protection of Kuru Lake, which is a strictly sensitive area to be protected, will contribute to the local economy.

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