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A Contemporary Study on Fisheries Production Rights Leased Dam Lakes in Sivas Province, Türkiye

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Research Article

ABSTRACT

Another important source of the world's aquaculture production, apart from the seas, is inland waters. In this study, the current status of the fishing fields of the province of Sivas, for which the right of production has been leased, in inland waters has been investigated. According to the January-2022 data of the Ministry of Agriculture and Forestry of the Republic of Turkey, there are three fishing fields in Sivas province, the right of production of which is leased. Among these, Kılıçkaya Dam Lake has the highest rental price. Kılıçkaya Dam Lake is followed by Gölova and İmranlı dam lakes. Sivas Province, where Gölova, Kılıçkaya and İmranlı dam lakes are located, for which the right of production is leased, does not have the opportunity to increase the production of fisheries through fishing. In addition, invasive rainbow trout caught in Gölova and İmranlı dam lakes pose a significant threat to native fish species and biodiversity. For these reasons, fisheries policies should be based on the sustainability of fisheries production with an ecosystem-based approach.

Keywords: Dam Lakes, Fisheries, Production Rights, Leased, Sivas, Türkiye

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ÖZ

Dünyanın su ürünleri üretimi yönünden denizler dışındaki bir diğer önemli kaynağı içsulardır. Bu çalışmada, Sivas İli'nin içsularında gerçekleştirilen istihsal hakkı kiralanmış su ürünleri avlak sahalarının güncel durumu araştırılmıştır. Türkiye Cumhuriyeti Tarım ve Orman Bakanlığı'nın Ocak-2022 yılı verilerine göre Sivas İli'nde istihsal hakkı kiralanmış üç adet su ürünleri avlak sahası bulunmaktadır. Bunlar içerisinde en yüksek kira bedeline sahip olan Kılıçkaya Baraj Gölü'dür. Kılıçkaya Baraj Gölü'nü ise Gölova ve İmranlı baraj gölleri takip etmektedir. İstihsal hakkı kiralanmış Gölova, Kılıçkaya ve İmranlı baraj göllerinin yer aldığı Sivas İli'nin avcılık yoluyla su ürünleri üretimini daha fazla artırma imkânı bulunmamaktadır. Ayrıca, Gölova ve İmranlı baraj göllerinde avcılığı yapılan istilacı olan gökkuşuğu alabalıkları yerli balık türleri ve biyolojik çeşitlilik için önemli bir tehdit oluşturmaktadır. Bu nedenlerle, balık avcılığı politikaları ekosistem temelli bir yaklaşımla su ürünleri üretiminin sürdürülebilirliği üzerine oluşturulmalıdır.

Anahtar Kelimeler: Baraj Gölleri, Su Ürünleri, Üretim Hakkı, Kiralama, Sivas, Türkiye

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Introduction

Inland water ecosystems have a special importance in terms of biodiversity in the world. These areas, which are in the nature of gene pools, make important contributions to biological diversity. Therefore, inland water ecosystems have been and continue to be the areas that human beings have benefited from since ancient times. Dams built to control the regime of streams have increased their impact on natural environments in recent years. Dam lakes have the characteristics of the rivers on which they are located, and the amount of water varies depending on the flow of the rivers they feed on. Dams were built for purposes such as energy generation, flood prevention, drinking water and irrigation. However, they are also used for different purposes such as fishing, aquaculture, entertainment, recreation and tourism. In addition to their hydrological characteristics, dam lakes increase their importance even more today, when fresh water resources are limited and they are faced with pollution factors.

Fish and other aquatic products are important sources of animal protein. With the understanding that the fishing capacity in aquatic ecosystems cannot be increased with the rapid population growth, studies on the development of aquaculture have gained momentum since the 1990s. While the fishery production of aquaculture has fluctuated over the years, aquaculture production shows a continuous increase trend (FAO, 2019). Fishery production in the world was 177.8 million tons in 2019. 92.5 million tons (52.02%) of this production was obtained from fishing and 85.3 million tons (47.97%) from aquaculture. 80.4 million tons of fishing production was obtained from the seas and 12.1 million tons from inland waters (GDF, 2021). The situation of fisheries and aquaculture in the world is of vital importance for social success.

According to the data of the Turkish Statistical Institute, it is seen that the amount of fish taken ashore has decreased in the last 20 years in general, and it has exhibited a fluctuating but relatively stable trend in recent years. Sea fish have an important place in Turkey's fishing production. Fisheries production in Turkey was 364.400 tons in 2020. Of this production, 331.281 tons were obtained from marine fish and 33.119 tons were obtained from inland fish catches (GDF, 2021).

For 2012, a total of 185 fishing fields in inland waters in Turkey were leased with a stock amount of 11.863 tons/year and a price of 1.681.699 TL (Yılmaz, 2014). Although Sivas Province has a very rich inland water potential in terms of fisheries, there is surprisingly little literature on the history, development and current situation of Sivas's inland fishery (Dirican, 2014). Despite all the studies carried out to date, the information and findings on fish and other living species in the inland waters of Sivas Province have not reached a sufficient level yet. This study is about the Gölova, Kılıçkaya and İmranlı dam lakes, whose fisheries production rights are leased in Sivas Province.

Materials and Methods

Gölova, Kılıçkaya and İmranlı dam lakes, which are the research areas, are within the provincial borders of Sivas. Sivas is a province with lands in the north-east of Turkey's Central Anatolian Region. A large part of Sivas province is located in the Kızılırmak River, and a part in the Yeşilirmak River and Euphrates River Basins. Sivas is adjacent to the provinces of Kayseri, Tokat, Ordu, Giresun, Erzincan, Malatya, Kahramanmaraş and Yozgat. The average elevation in Sivas, which is generally a mountainous and high plateau, is 1300 meters. The technical specifications of Gölova Dam Lake, Kılıçkaya Dam Lake and İmranlı Dam Lake, whose fisheries production rights have been leased in Sivas province, are presented in Table 1. The geographical location of Gölova Dam is 40° 2' 42" North and 38° 37' 21" East gps coordinates. Gölova Dam Lake is approximately 190 kilometers away from Sivas city center. Gölova Dam, which was built for irrigation and energy production, was put into operation in 1990 and was built on Çobanlı Stream. The height of Gölova Dam Lake from the river bed is 26 meters and the lake area is 4.85 square kilometers (Table 1). The maximum water depth of Gölova Dam Lake is 13 meters (Dirican, 2022). Gölova Dam Lake is approximately 3 km from the Gölova district of Sivas province.

Table 1. The dams whose fisheries production rights are leased in Sivas and their features

Features	Dam Lakes		
Dam Lake Name	Gölova Dam Lake	Kılıçkaya Dam Lake	İmranlı Dam Lake
Province	Sivas	Sivas	Sivas
Build Start Year	1981	1980	1994
Build Completion Year	1990	1989	2002
Goal of the Dam	Energy, Irrigation	Energy	Energy, Irrigation
River Name	Çobanlı Creek	Kelkit Stream	Kızılırmak River
Body Fill Type	Soil	Rock	Soil
Height	26 m	132 m	49.00 m
Lake Volume	65 hm ³	1400.4 hm ³	62.50 hm ³
Lake Area	4.85 km ²	64.40 km ²	6.50 km ²

The geographical location of Kılıçkaya Dam Lake is 40° 14' 21" North and 38° 10' 45" East gps coordinates. It is approximately 160 kilometers from Sivas city center. Kılıçkaya Dam, which was built for the purpose of energy production, was put into operation in 1989 and was built on Kelkit Stream. The height of Kılıçkaya Dam Lake from the river bed is 132 meters and the lake area is 64.40 square kilometers (Table 1). The maximum water depth of Kılıçkaya Dam Lake is 100 meters (Dirican et al. 2012). Kılıçkaya Dam Lake is approximately 25 km from the Suşehri district of Sivas province.

İmranlı Dam Lake was built on Kızılırmak River within the borders of Sivas province between 1994-2002 for irrigation and energy production. İmranlı Dam Lake is located at 39° 52' 38" North and 38° 10' 0" East gps coordinates. It is approximately 110 kilometers from Sivas city center. The height of İmranlı Dam Lake from the river bed is 49 meters and the lake area is 6.50 square kilometers (Table 1). The maximum water depth of the İmranlı Dam Lake is around 30 meters. İmranlı Dam Lake is located approximately 8 km from İmranlı district of Sivas province.

The "Regulation on Renting in Fisheries Production" regarding the leasing of Fisheries production areas in Turkey has been published in 2020 (Official Gazette, 2020). The purpose of this Regulation is to regulate the procedures and principles regarding the leasing of water and water areas needed in aquaculture investments and the right to produce commercial, amateur, breeding and recreational aquaculture products for the efficient use of Turkey's water resources and the sustainability of aquaculture activities. This Regulation covers the water and water areas needed in the aquaculture facilities to be built on land by taking water from the sea and inland waters owned by the Treasury or the General Directorate of State Hydraulic Works or under the jurisdiction and disposal of the State, and for the production of commercial, amateur, breeding and recreational aquaculture products. It covers the procedures and principles regarding the leasing of the right.

According to the Official Gazette, 2020 regulation, it is obligatory to lease from the Ministry of Agriculture and Forestry for the right to produce for commercial, amateur, breeding and recreational purposes in aquaculture production areas. On behalf of the Ministry, these procedures are carried out by the provincial directorates in the provinces. In places where the right to produce commercial fishery products is leased, amateur fishing can be carried out in areas and times to be determined by the provincial directorate, in accordance with the conditions determined in the communiqués regulating commercial and amateur fisheries hunting published by the Ministry. The rental price is determined according to the calculation method created on the fishery products information system according to the criteria to be determined by the Ministry. While evaluating the rental applications to be made for production purposes in fishery production areas, it is taken into account whether there is an annual catchable stock in terms of sustainable fisheries

management. Determination of the annual stock amount of catchable fisheries is done or done by the Ministry before the aquaculture production areas whose lease term is completed are rented for the new term or in case of need. Fishing areas that can be rented are rented out by bargaining method, by means of a commission created with the right to produce by hunting. No more can be produced than the estimated annual catchable stocks of fishery products determined for the production areas of fishery products whose right to be harvested through hunting is rented. The production activities are followed by the provincial directorate. Even in a species, when the estimated total amount of catchable stock for lease is produced, the production activity of that species for that year is terminated. The tenant is responsible for keeping the record of the amount of each species harvested through hunting separately, in accordance with the determined time and forms, and notifying the provincial directorate. The accuracy of this information is checked by the provincial directorate and recorded in the aquaculture information system. It is obligatory to hunt in accordance with the communiqués regulating commercial and amateur fishing published by the Ministry in areas where the right to produce fishery products through hunting is leased. Responsibility in this regard belongs to the tenant.

The main material of this study consists of the data of the fishing areas for which the right of production is leased in Sivas Province, shared by the Ministry of Agriculture and Forestry of the Republic of Turkey in January 2022. The second data of the study was obtained from the announcements and archives of Sivas Provincial Directorate of Agriculture and Forestry. The obtained data were evaluated by analysis and synthesis. As a result of the study, the contribution of the Gölova, Kılıçkaya and İmranlı dam lakes, for which the right to produce fisheries is leased in Sivas, to inland water fisheries production and its future predictions have been made.

Results and Discussion

According to the data of the Ministry of Agriculture and Forestry in January-2022, there are three fishing fields in Sivas Province, the right of production of which is leased. These are Gölova Dam Lake, Kılıçkaya Dam Lake and İmranlı Dam Lake fishing areas. The information on the fishing fields for which the right of production is leased in Sivas Province is presented in Table 2. The production rights of the Gölova Dam Lake fishing area have been leased from 04 February 2020 to 04 February 2023 (Table 2). The "Right of Production Tender" of the Gölova Dam Lake Fishing Field within the borders of Gölova District of Sivas Province was made by Sivas Provincial Directorate of Agriculture and Forestry Rental and Tender Commission on 04.02.2020. The tender for the Gölova Dam Lake Fishing Field started with an auction method, with an estimated rental price of 4.408,60 (Four Thousand Four Hundred and Eight Turkish Liras and Sixty Kuruş).

Table 2. The dam lakes whose fisheries production rights are leased in Sivas.

N	Dam Lake Name	District	Renters	Rent Start Date	Rent End Date
1	Gölova Dam Lake	Gölova	Ahmet Kor	04.02.2020	04.02.2023
2	Kılıçkaya Dam Lake 2nd Area	Suşehri	Bahattin Duran	14.10.2020	13.10.2023
3	İmranlı Dam Lake	İmranlı	Erhan Yıldızay	17.08.2021	16.08.2026

The tender, which was made with the auction method, remained with Ahmet Kor for three years with an annual rent of 14.000 Turkish Liras (URL-1, 2020). However, a license letter was given to one boat for Gölova Dam Lake.

The fisheries rights of the Kılıçkaya Dam Lake fishing area have been leased from 14 October 2020 to 13 October 2023 (Table 2). Similarly, Kılıçkaya Dam Lake 2nd fishing Field "Tender for Right of Production", which is open to commercial fishing by DSI within the borders of Suşehri District of Sivas Province, was made by Sivas Provincial Directorate of Agriculture and Forestry Rental and Tender Commission on 14.10.2020. The tender for the Kılıçkaya Dam Lake 2nd Region Fishing Field has started with the auction method, with the estimated rental price of 31.234,80 (Thirty-One Thousand Two Hundred Thirty-Four Turkish Liras and Eighty Kuruş). The tender, which was made by the auction method, remained with Bahattin Duran for three years with an annual rental price of 67.500 Turkish Liras (URL-1, 2020). In Kılıçkaya Dam Lake, license letter was given to two boats.

The fisheries rights of the İmranlı Dam Lake fishing area have been leased from 17 August 2021 to 16 August 2026 (Table 2). The "Right of Procurement Tender" of the İmranlı Dam Lake Fishing Field within the borders of İmranlı District of Sivas Province, which is open to commercial fishing, was held on 17.08.2021 at the Provincial Directorate Meeting Hall by Sivas Provincial Directorate of Agriculture and Forestry Rental and Tender Commission. The tender for the İmranlı Dam Lake Fishing Field has started with the auction method, with an estimated rental price of 3.309 (Three Thousand Three Hundred and Nine Turkish Liras). The tender held by the auction method remained with Erhan Yıldızay for five years (URL-2, 2021). A license letter was given to one boat for fishing in the İmranlı Dam Lake.

Those who will participate in the tenders; (1) Current letter stating that those who are engaged in fisheries do not owe any debt from Sivas Special Provincial Administration and Finance, (2) An updated letter from the Social Security Institution stating that they do not owe any premiums, (3) Tax debts of those who do not engage in fishery products They are required to bring an updated letter from the Ministry of Finance. However, in order to participate in the tenders, they are requested to personally apply to Sivas Provincial Directorate of Agriculture and Forestry, Fisheries and Fisheries Branch Directorate, on the dates specified together with the above documents. In addition, natural or legal persons who are awarded the tenders are required to obtain a "ship license letter" for

the fishing boats they will use in aquaculture. This document must be submitted to Sivas Provincial Directorate of Agriculture and Forestry. Fishing will not be carried out without obtaining this certificate. Even if they have received the tender, it is reported that the tender they have received will be canceled unilaterally by the Provincial Directorate of Agriculture and Forestry (URL-2, 2021).

Gölova Dam Lake, where this study was carried out, has a rich ecosystem in terms of fisheries. The most caught fish species in the aquatic ecosystem of Gölova Dam Lake are *Cyprinus carpio*, *Capoeta sieboldii*, *Capoeta tinca*, *Squalius cephalus*, *Barbus lacerta* and *Chondrostoma nasus*. However, there is a fish farm in Gölova Dam Lake that performs rainbow trout culture in net cages. This fish farm has an annual capacity of 50 tons (Dirican, 2022). Rainbow trout (*Onchorynchus mykiss*), which escaped from this rainbow trout farm, are found in Gölova Dam Lake and are fished.

Fish with high economic importance such as *Cyprinus carpio*, *Squalius cephalus*, *Capoeta sieboldii*, *Capoeta tinca*, *Atherina boyeri*, *Barbus plebejus* and *Silurus glanis* live in the aquatic ecosystem of Kılıçkaya Dam Lake (Dirican et al. 2012). In Kılıçkaya Dam Lake, rainbow trout culture is not done in net cages. For this reason, there are no rainbow trout in Kılıçkaya Dam Lake.

Fish species such as *Cyprinus carpio*, *Barbus escherichi*, *Capoeta baliki*, *Capoeta sieboldii*, *Chalcalburnus chalcoides* and *Squalis cephalus* are caught in the ecosystem of İmranlı Dam Lake. In addition, there is an enterprise with an annual production capacity of 950 tons, which intensively breeds rainbow trout in 42 net cages in İmranlı Dam Lake. At the same time, Rainbow trout (*Onchorynchus mykiss*), which escaped from this rainbow trout farm, are found in İmranlı Dam Lake and are fished.

Onchorynchus mykiss, which is caught from Gölova and İmranlı dam lakes, whose right of production is leased, is not the natural fish species of these two dam lakes, but is an invasive species that has infected these ecosystems for reasons such as aquaculture. This type of trout, known as rainbow trout, is one of the most commonly farmed in inland waters and seas. It is also a common species in sport fishing and commercial fishing. Rainbow trout, one of the invasive fish species, pose a significant threat to the fisheries and biodiversity of Gölova and İmranlı dam lakes. This threat is realized through the invasion of the habitats of the species and predation, which can lead to the rapid extinction of local and endemic species and the end of fisheries production in the basins.

In the table 6 of the 7th paragraph of the 12th proviso of the Communiqué No. 4/2 regulating the Amateur (Sporty) Purpose Fishing published in the Official Gazette dated 13.08.2016 and numbered 29800 throughout the province of Sivas, except for chub (*Squalius cephalus*) and natural trout, rainbow trout (*Onchorynchus mykiss*), which can be made in rivers between 01 April and 01 July in all inland waters of Turkey within the borders of our province; Fishing of *Cyprinus carpio*, *Tinca tinca*, *Capoeta* sp., *Squalius cephalus* and other species is prohibited. In the Gölova, Kılıçkaya and İmranlı dam lakes located in Sivas province, amateur angling is also carried out. The province of Sivas, where Gölova, Kılıçkaya and İmranlı dam lakes, whose right to produce fishery products are leased, are located, has a very good potential in terms of rainbow trout farming and inland water fishing. While 99.08% of the total production in Sivas is obtained from aquaculture, 0.92% is obtained from inland water fishing (Dirican, 2014). Dirican (2014) reported that rainbow trout farming has come to the fore in the market in Sivas province and that inland water fishing is declining in value.

The amount of capture fisheries production was determined as tons/year 49.07 in 2006, 50.21 in 2007, 32.54 in 2008, 20.96 in 2009, 39.45 in 2010, 38.98 in 2011, 39.70 in 2012 and 51.47 in 2013 by Dirican (2014). According to this, the amount of capture fisheries production in Sivas ranged from 20.96 to 51.47 tons between 2006 and 2013. During the same period, Sivas capture fisheries production peaked at 51.47 tons in 2013.

Similarly, the amount of capture fisheries production was reported as tons/year 39.70 in 2012, 51.47 in 2013, 52.00 in 2014, 60.00 in 2015, 46.00 in 2016, 47.00 in 2017 and 49.6 in 2018 (SAFAR, 2019). According to this, the amount of capture fisheries production in Sivas ranged from 20.96 to 51.47 tons between 2012 and 2018. During the same period, Sivas capture fisheries production peaked at 60.00 tons in 2015.

When these studies carried out by Dirican (2014) and SAFAR (2019) are evaluated, it is seen that there are no significant fluctuations in the production of fisheries by fishing from the inland waters of Sivas province for the period of 2006-2018. For this reason, Sivas Province does not have the opportunity to further increase aquaculture production through inland fisheries. However, the stock size of catchable inland water fish has been reached in Sivas Province. In order for the inland fisheries of Gölova, Kılıçkaya and İmranlı dam lakes to be sustainable and productive, the factors that harm fish populations must be eliminated or reduced. Fisheries management plan should be prepared and implemented by the relevant institutions for Gölova, Kılıçkaya and İmranlı dam lakes. In addition, it is recommended to implement training projects for those engaged in both commercial and amateur fishing activities.

The quality and quantities of Gölova, Kılıçkaya and İmranlı dam lakes, where fishing activities are carried out in the province of Sivas, where the right of production is leased, must be protected from all kinds of pollution and deterioration. It is very important to transfer the water resources to the next generations as well as the continuation of inland water fishing from these dam lakes.

Conclusion

In this study, it was determined that while the fisheries production right of İmranlı Dam Lake was leased for five years, the fisheries production right of Kılıçkaya and Gölova dam lakes was leased for three years. When all data are evaluated, the sustainability of fishing in Gölova, Kılıçkaya and İmranlı dam lakes, where the right of production is leased, will be possible with the cooperation of the society and relevant government institutions. Considering the current situation of fisheries production from inland waters in Sivas Province, it is of great importance that fishing is carried out without damaging the stocks. With this awareness, sustainable fishing of Gölova, Kılıçkaya and İmranlı Dam Lakes will be possible.

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