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The natural wealth of karabakh includes small rivers and lakes

F.G.Aliyev, I.A.Guliyev

Azerbaijan Architecture and Construction University, Baku, Azerbaijan

ilgarazayoglu@gmail.com

Abstract: The natural resources of Karabakh, focusing on its rivers and lakes. It begins by highlighting the exploitation of these resources during the occupation of Karabakh and emphasizes the importance of their conservation and sustainable use post-liberation. The inaccurate information about several rivers and lakes in the region is noted. Detailed descriptions of rivers like Khachinchay, Gargarchay, Hakarichay, Kondalanchay, and Tartarchay, along with lakes such as Boyuk Alagol, Kichik Alagol, Parichinqil Qaragolu, and Parichinqil Alagolu are provided, including their geographical features, tributaries, water regimes, and usage. The text underscores the significance of groundwater and rainfall in these water systems and mentions the impact of volcanic activities on the landscape. It also discusses plans for redirecting water flows for irrigation and highlights the ecological importance of the region's lakes and marsh areas.

Keywords: Karabakh, Rivers, Lakes, Biodiversity, Conservation, Restoration, Sustainable use, Tributaries, Water reservoir, Ecosystem

1.INTRODUCTION

During the nearly 30 years of occupation of Karabakh, its natural resources, along with its historical monuments, and every drop of its life-giving rivers have been ruthlessly exploited by Armenian occupiers, facing ecological terrorism. After liberation from occupation, each citizen has various responsibilities for the revival of Karabakh. However, a significant task for our scientists is the research, study, conservation, restoration, and sustainable use of biodiversity and fish species in the water basins located in the Karabakh region. Before the occupation, fish species caught in the Caspian Sea met the country's demand, so internal water basins were not given much importance. However, in the post-occupation period, studying and preserving the existing biodiversity is of great importance in every aspect. During the period before the occupation, the information about the biodiversity of the water reservoirs in Karabakh was of a general nature. The information below about a number of rivers and lakes located in the Karabakh region is inaccurate [1-10].

2.EXPERIMENTAL DETAIL

Khachinchay

Khachinchay is an important river located in the Karabakh region of Azerbaijan. This river flows from the mountains of Karabakh, passing through the village of Khachinli, from which it takes its name, and joins the Kura River.

Khachinchay is located in areas rich in river networks and forms part of the hydrological system of Karabakh. This river functions as an important water source for agriculture, drinking water supply, and ecosystem enhancement in the region. Xachinchay originates from the streams and springs formed by the slopes of the mountains rising on the foothills of the Lesser Caucasus, such as Haji-Yurt (2397 m), Uyuxlu (2316 m), Chilqyas (2362 m), Chichakli (2343 m), and Alla-Qaya (2583 m).

The length of Xachinchay is 116 km, and its watershed area covers 657 km². The river, which is 5 km long, has a total of 12 tributaries, with 5 on the right and 7 on the left. The Kolataq River is the largest tributary of the river.

The main reason for the inability of the Khachinchay's water to reach the Kura River is due to the volume of water usage and the construction of a water reservoir on it. The average altitude of the Xachinchay basin is 1558 meters, and its total descent is 2090 meters. The slope is steeper upstream, representing 74.9 per mil, while the average slope is 17.6 per mil. The density of the river network in the upper mountainous regions of the basin is 1.3-1.4 km/km², but for the entire basin, this value is 0.81 km². There are many waterfalls and springs around the Khachinchay river.

The waters coming from the slopes of nearby mountains in the upper parts of the river create unique natural landscapes. The main source of nourishment for the river is rainfall. The water regime is mainly supplied by rainfall, with more precipitation occurring during the summer and autumn seasons. However, flash floods can be observed as a result of intense rainfall. The Khachinchay reservoir has been built to regulate the flow of the Khachinchay river.

The main tributaries of the Khachinchay river are

| Name | It reaches the Kura River from which shore? | ML,km | L,km | F,km ² |
|-----------|---|-------|------|-------------------|
| Anonymous | Right | 112 | 6 | 10 |
| -“”- | Left | 111 | 10 | 28 |
| -“”- | Left | 107 | 7 | 17 |
| Ganzah | Right | 100 | 9 | 30 |
| -“”- | Right | 90 | 7 | 17 |
| Kolataq | Right | 82 | 25 | 103 |
| Anonymous | Right | 81 | 9 | 22 |

Gargarchay

Gargarchay, forming at the confluence of Khalfalichay and Zarislichay, flows from the eastern slopes of the Karabakh range in the Lesser Caucasus. The source of the river is known as the source of Zarislichay. The source of the river is located at an altitude of 2080 meters. Gargarchay, initially flows southward from the origin in the Shelli village, then changes direction from west to east towards its source. The river does not reach the Kura River and gets lost in the reeds near Aggol. The length of the Gargarchay is 115 km, and its basin area covers 1490 km². It has 11 tributaries that are longer than 5 km, with 5 on the right and 6 on the left side. Khalfalichay is one of the main tributaries of

Gargarchay, along with Dagdagan, Kirqican, Kushchular, Badara, Khanabad. The watershed of Gargarchay extends from the southwest to the northeast. From the north, it is adjacent to Khalfalichay, and from the west, it shares its watershed with the Hakarichay along the Karabakh range. The water regime of Gargarchay is classified as torrential. Gargarchay's alimentation consists of 17% snowmelt, 47% rainfall, and 36% groundwater.

The main tributaries of the Gargarchay river are

| Name | It reaches the Kura River from which shore? | ML, km | L, km | F, km ² |
|--------------|---|--------|-------|--------------------|
| Anonymous | Right | 103 | 10 | 21 |
| Khalfalichay | Left | 90 | 24 | 119 |
| Dagdagan | Right | 87 | 13 | 31 |
| Balluca | Left | 83 | 24 | 103 |
| Kushchular | Right | 82 | 12 | 42 |
| Badara | Left | 77 | 32 | 263 |
| Khanabad | Left | 71 | 7 | 5 |

Hakarichay

Hakarichay forms from the confluence of the rivers Shalva and Gochazsu (at an elevation of 947.6 meters). The main river Shalva is accepted, its source is at an altitude of 2580 meters in the Mikhtokan range.

Hakarichay flows from the direction of Bazarchay and falls 14 km upstream (at 358.1 m). The length of Hakarichay is 113 km, and its watershed area is 2570 km². The river has 15 tributaries. Keep 5 teas from them to the right, and leave 10 teas to the left. The average elevation of Lake Hekerichay is 1690 meters. The majority of its right bank is within the territory of the Karabakh volcanic plateau. In the basin of Lake Hekerichay, there is a forest cover of 248 square kilometers. The total descent of the river is 2221.9 meters, with an average gradient of 19.6 per mill. The density of the river network is 0.24 km/km². Qorçuçay, Hocazsu, Yağlıdərə, Zabux, Ağsuçay, Kiçik-Hekəri are the main tributaries of Hekerichay. Since volcanic rocks dominate in the basin of Hekerichay, the role of groundwater recharge is significant. The role of rainfall water in recharge is 10-15%. The main reason for the occurrence of autumn floods in September-October in Hekerichay is the geological structure of the basin.

Kondalanchay

Kondalanchay starts from a spring on the eastern slope of the Lesser Caucasus Chakhmaq Range (1780

m). It flows through the territories of the districts of Khocavend and Fuzuli, and eventually joins the Aras River near the village of Bala Bahmanli. The average elevation of the basin is 708 meters, while it reaches up to 1130 meters at Qirmizi-Bazar. There is a forest cover 49 square kilometers in its basin. The snow cover on the terrain melts quickly because the elevation of the basin is not high, which leads to the rapid onset of the flood regime. Flood regime predominates in the Kondalanchay as well. Rainfall floods occur frequently. The duration of the floods is 6 days.

The main tributaries of the Hakarichay river are

| Name | It reaches the Kura River from which shore? | ML, km | L, km | F, km ² |
|----------------|---|--------|-------|--------------------|
| 1 | 2 | 3 | 4 | 5 |
| Gorguchay | Left | 90 | 20 | 86 |
| Hocazsu | Right | 70 | 63 | 414 |
| Zabukh | Right | 52 | 53 | 524 |
| Aghsuchay | Right | 43 | 25 | 88 |
| Mazmazak | Right | 37 | 13 | 35 |
| Khoshkedikchay | Left | 33 | 23 | 113 |
| Kichik-Hakari | Left | 20 | 26 | 124 |

Tartarchay

Tartarchay originates from the confluence of rivers and springs flowing in the Lesser Caucasus. The source of Tartarchay is at an altitude of 3210 meters. The river flows from the source at an altitude of 523 meters above sea level with a height of 3 meters.

The length of the river is 200 km, and the area of its basin is 2650 km². Tartarchay has 31 tributaries. Eleven of them are right and twenty are left. There are small lakes on the left tributaries of the river, with the main ones being Zalkhagol, Qamishligol, Zalligol and Qapigol. The main tributaries of Tartarchay include Karakhan, Levchay, Tutgun, Keshishkend, Agdabanchay and Turagachay. The role of groundwater in the recharge of Tartarchay is greater in its middle course. Groundwater recharge accounts for 23% annually near Kalbajar, while it reaches up to 70% in the middle course. There are hydrological stations operating on Tartarchay and its tributaries. Additionally, there is an observation station at the Sarsang reservoir.

Boyuk Alagol is a lake located in the Kalbajar district of Karabakh. This lake is recognized as one of the natural beauties of Karabakh. The lake attributed to

the lakes of the Lesser Caucasus is located on the western border with Armenia.

The level of the lake is 2729 meters above sea level. The longest part of the lake is 3.7 kilometers, while the widest part is more than 9 meters. The volume of the lake is 24.3 million cubic meters. The surroundings of the lake are valuable alpine meadows.

The main tributaries of the Tartarchay river are

| Name | It reaches the Kura River from which shore? | ML, km | L, km | F, km ² |
|-------------|---|--------|-------|--------------------|
| 1 | 2 | 3 | 4 | 5 |
| Anonymous | Right | 190 | 5 | 19 |
| Bagirsakh | -""- | 182 | 7 | 3 |
| Tutgun | Right | 136 | 33 | 521 |
| Keshishkend | Left | 134 | 14 | 49 |
| Agdabanchay | Left | 110 | 19 | 58 |
| Anonymous | Right | 109 | 10 | 39 |
| Turagachay | -""- | 78 | 35 | 172 |

The area is 5.1 km², length is 3670 m, maximum width is 2875 m, average width is 1365 m, shoreline length is 24.8 km, and maximum depth is 9.4 m.

The area where Boyuk Alagol is located hosts up to 30 lakes, including those drying up in the summer. The largest among them are Kichik Alagol (area 0.9 km²), Cilligol (area 0.3 km²), and Dikpilakan Lake located at the source of Dikpilakan stream (3028 m) with an area of 0.06 km². Seven rivers flow into Boyuk Alagol. The largest among them are Kurbaghalı and Azad rivers.

Kurbaghalıchay, originating from the northern-western slope of the Serchelidagh range and flowing into Kichik Alagol, likely combined with Azadchay, Dikpilakanchay, and others, before volcanic eruptions occurred in this area, to ultimately flow into Goyche Lake. However, due to the volcanic eruption altering the terrain, it severed the connection of those areas with Goyche Lake, leading to the formation of individual lakes and marsh areas due to natural depressions. Currently, there are six marsh areas within the area of Boyuk Alagol, totaling an area of 3.5 km². This constitutes 2.7% of the basin's area. In the recent past, these marsh areas formed a system of interconnected lakes. Due to erosion, the shores of the lakes have lowered, and the inability for water to collect in the depressions has turned them into marshes. At present, water from the lake is only used for irrigation of the fields in the highlands. During the moderately wet period, it is presumed that the

amount of water transferred from Boyuk Alagol to Goyche Lake via underground flow exceeds 100 million cubic meters. The possibility of this water flowing into the Tartarchay basin through relief features has been identified. The water flowing from the lake goes towards Armenia, where it is used to divert the waters of the Arpa River to fill Lake Goyche. It is planned to redirect the lake's waters eastward for filling the Tartar River.

Kichik Alagol

Kichik Alagol is located 2 km southeast of Boyuk Alagol. The lake covers an area of 0.9 km², with a length of 2000 m, a maximum width of 825 m, an average width of 450 m, and a shoreline length of 5260 m. Much of the lake is covered with aquatic vegetation. Its maximum depth is 4 m. The main water source of the lake is from Kurbaghalichay and other small streams. Another factor contributing to the increase in lake water is groundwater. The water of the lake flows into Boyuk Alagol.

During the summer months, the temperature of the lake surface does not exceed 14° - 16°C. The temperature of spring water emerging near the shore ranges from 4° - 6°C. From the end of October to the beginning of May, the surface of the lake freezes over with ice. The water is hydrocarbonate-calcium. The total amount of mineral substances in its composition is not more than 60 mg/l.

Water from Kichik Alagol is only used for irrigation in the highlands. It is also sometimes called **İshikli Qaragol** or simply **Qaragol**. It is located on the border between Azerbaijan's Lachin district and Armenia's Goris district. Gol, approximately 2 square kilometers in size, and is located at an altitude of 2,666 meters above sea level. The water of the lake is cold and clean. It is home to various species of Iskhan trout.

Parichinqil Qaragolu

Parichinqil Qaragolu is a lake located in the territory of the Lachin district. Situated on the southwestern slope of the Alagoller mountain (Karabakh plateau), it is a beautiful freshwater lake at an elevation of 2961 meters. It is used for irrigation purposes. As there are several lakes named Qaragol in the area, the name Parichinqil mountain has been used for differentiation. The area of the lake is 0.94 km², and its maximum depth is 5.4 meters.

Parichinqil Alagolu

Parichinqil Alagolu is a lake located in the territory of the Lachin district. It is a beautiful freshwater lake situated on the border with Armenia's Goris district. It is located at an altitude of 2974 meters. This lake of volcanic origin is used for irrigation purposes in the region.

3.CONCLUSION

The text underscores the significant impact of the nearly 30 years of occupation of Karabakh on its natural resources, including its rivers and lakes. It highlights the exploitation and ecological degradation faced by these resources during the occupation period. Following the liberation from occupation, the responsibility for the revival of Karabakh falls upon every citizen, with particular emphasis on the crucial role of scientists in researching, studying, conserving, restoring, and sustainably using the biodiversity and fish species in the water basins of the region.

Moreover, it points out the importance of reevaluating the significance of internal water basins, especially in the post-occupation period when the demand for fish species from the Caspian Sea has been disrupted. The text also notes the inaccuracies in the information provided about certain rivers and lakes in the Karabakh region.

Overall, the conclusion emphasizes the urgent need for concerted efforts in preserving and restoring the natural wealth of Karabakh, ensuring the sustainable management of its water resources, and safeguarding its biodiversity for the benefit of present and future generations.

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