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SUSTAINABLE USE OF AGRICULTURAL LAND OF KHACHMAZ DISTRICT

©*Jafarov T.*, Azerbaijan University of Architecture and Construction,
Baku, Azerbaijan, tariyel.jafarov@azmiu.edu.az

УСТОЙЧИВОЕ ИСПОЛЬЗОВАНИЕ СЕЛЬСКОХОЗЯЙСТВЕННЫХ ЗЕМЕЛЬ ХАЧМАЗСКОГО РАЙОНА

©*Джафаров Т. И.*, Азербайджанский университет архитектуры и строительства,
г. Баку, Азербайджан, tariyel.jafarov@azmiu.edu.az

Abstract. Land use, like any other natural resource, involves loads on nature and causing harm to it. Therefore, completely harmless production today is considered impossible. Because of this, goals have been identified that establish the rationality of land use. Such goals include, taking into account natural conditions and economic indicators in the corresponding territory, ensuring the interests of society as a whole, the efficiency of the production process, as well as the protection of the quality of land and its reproduction. These goals are always unchanged, and their achievement depends on the technological development of production, the economic level, and the needs of society. In this article, the agricultural suitability level of Khachmaz district land was analyzed based on the cadastral database created on the basis of GIS technologies. It was also noted the need to take a number of measures to reduce the risk of soil erosion.

Аннотация. Землепользование, как и любой другой природный ресурс, сопряжено с нагрузками на природу и причинением ей вреда. Поэтому полностью безвредное производство сегодня считается невозможным. В связи с этим были определены цели, устанавливающие рациональность землепользования. К таким целям относятся, с учетом природных условий и экономических показателей на соответствующей территории, обеспечение интересов общества в целом, эффективность производственного процесса, а также охрана качества земли и ее воспроизводства. Эти цели всегда неизменны и их достижение зависит от технологического развития производства, уровня экономики и потребностей общества. В статье проанализирован уровень сельскохозяйственной пригодности земель Хачмазского района на основе кадастровой базы данных, созданной на основе ГИС-технологий. Также была отмечена необходимость проведения ряда мероприятий по снижению риска эрозии почв.

Keywords: land use, erosion, cadastre surveys, soil, soil salinization, agriculture.

Ключевые слова: использование земель, эрозия, кадастровое обследование, почва, засоление почвы, сельское хозяйство.

The climate of the area belongs to the temperate-hot semi-desert and dry steppe types with dry summers. This type of climate is characterized by low humidity, mild winters and hot and dry summers. The average annual temperature is 11.8°C. The average monthly temperature in January is 0.9-1.0°C, and the average monthly temperature in July is 23-24°C. The average annual temperature of the soil surface is 15°C. The average annual relative humidity is 78%. The annual rainfall is 343 mm. 726 mm of possible evaporation from the surface cover per year.

20,800 hectares of the investigated area are covered with forests. There are 8 rivers and 3 artificial lakes here. The flora of the region includes hips, ivy, yarrow, butterbur, mint and other medicinal plants. The soils are meadow-forest, gray-brown and light gray-brown. Meadows and bushes are widespread (<https://goo.su/RTPzf>).

Rational use of land is an integral part of the legislation today, which includes requirements for both nature protection and maximum production burden in agriculture. In defining land-use management, this concept includes both economic profitability and the protection of exploited land and adjacent natural objects in general.

Khachmaz region is located in the north-eastern part of Azerbaijan. Part of the Samur-Davachi lowland belongs to the territory of this region. Khachmaz region is bordered by the Russian Federation in the north, Gusar and Guba regions in the west, Shabran region in the south, and the Caspian Sea in the east. The sea border of the region is 70 km, the border with Russia is 14 km (www.xachmaz-ih.gov.az).

The relief of the territory of Khachmaz region consists of sloping plains, formed mainly on alluvial-proluvial sediments [1, p. 200-208].

Methods

Whether the lands of Khachmaz region are suitable for the agriculture, as well as the indicators of irrigated and irrigated areas were analyzed on the basis of the cadastral database created on the basis of GIS technologies of that area.

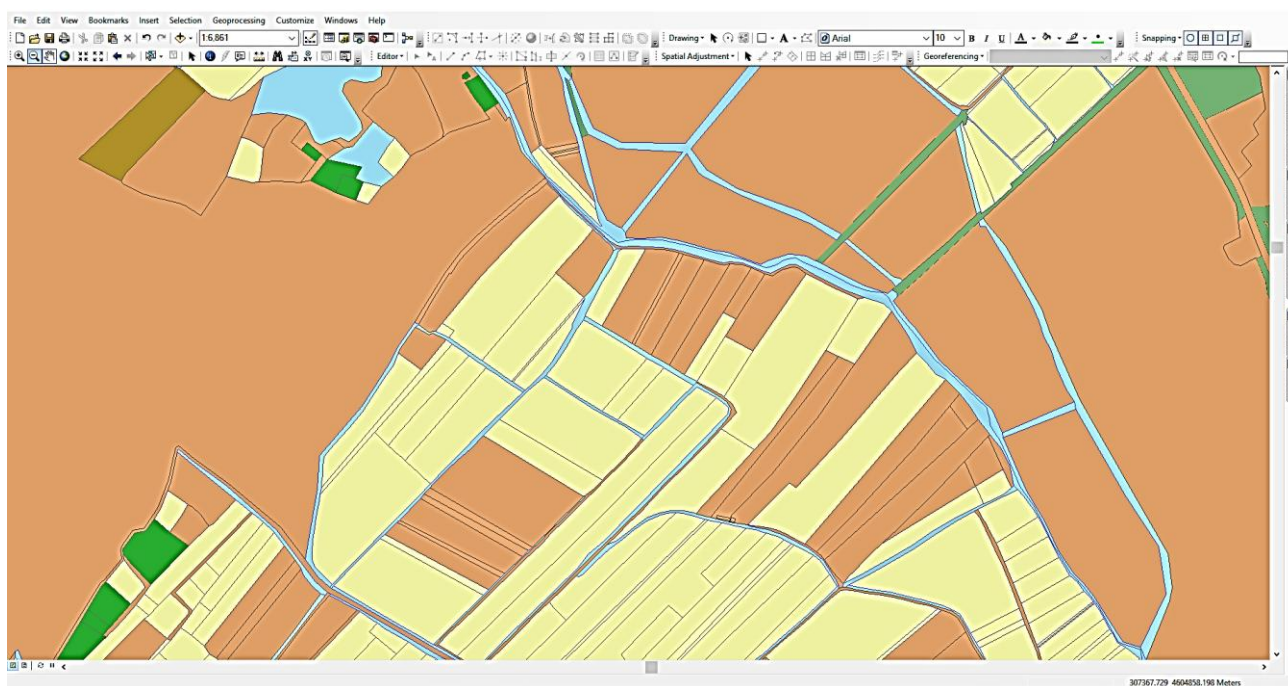


Figure. A fragment of the land registration map of Khachmaz region prepared with GIS software

Discussion

The total area of the investigated area is 98226,72 hectares, of which 77894,12 hectares was studied. The arable land is 33160,02 hectares, of which 32845,29 hectares are irrigated. There are 1711,80 hectares of land under perennial plantations in the region, of which 1654,84 hectares are irrigated. 8400,92 hectares under orchards, 885,53 hectares under vineyards, 0,72 hectares under orchards and all vineyards are irrigated. 1648,47 hectares of 4466,06 hectares of pastures are irrigated.

The total area of backyards is 10289,50 hectares and all of them are irrigated. There are 20674,32 hectares of forest in the Khachmaz region.

Table

AREAS OF AGRICULTURAL LAND

Type of land ownership	Place of agricultural use (ugodiya)	In hectares		
		Irrigated	Damn (other)	Total area
State property	Arable field	5473.73	46.18	5519,91
	Perennial plantings	786.67	10.21	796.88
	Melons	-	-	-
	Orchards	520.01	0.67	520,68
	Vineyards	26.64	-	26,64
	Tea plantations	0.01	-	0,01
	Hay field	31.74	-	31,74
	Pasture	103.1	165.33	268,43
	Shrubs	-	29.79	29,79
	Yard area	14.77	-	14,77
Private property	Arable field	22189.39	17.22	22206,61
	Perennial plantings	74.77	22.17	96,94
	Melons	5.18	-	5,18
	Orchards	7188.16	0.05	7188,21
	Vineyards	794.23	-	794,23
	Tea plantations	2.28	-	2,28
	Hay field	13.85	9.80	23,65
	Pasture	-	-	-
	Shrubs	-	-	-
	Yard area	-	-	-
Municipal property	Arable field	5182.17	251.33	5433,50
	Perennial plantings	793.40	24.58	817,98
	Melons	-	-	-
	Orchards	692.03	-	692,03
	Vineyards	64.66	-	64,66
	Tea plantations	-	-	-
	Hay field	64.33	30.44	94,77
	Pasture	1545.37	2652.26	4197,63
	Shrubs	1.12	1211.12	1212.24
	Yard area	10274.73	-	10274.73

There is a danger of salinization in a small part of irrigated lands in Khachmaz region. The process of soil salinization was studied in 4447.59 hectares of the region. According to the research, 1104.37 hectares of the studied area were weakly saline, 178.77 hectares were moderately saline and the rest were not saline [3, p. 434-500].

Despite the fact that the territory of the region is flat, all types of erosion processes can be found here. And tensions of anthropogenic factors caused the erosion process in the area. Irrigation, looting and wind erosion are more common here. Neglect of irrigation techniques in arable lands has strongly influenced the development of irrigation erosion. Irrigation washed away the fertile part of the soil and significantly reduced the productivity of the soil and the crops grown there. Due to the fact that

the soil-forming rocks of the area are brittle carbonate rocks, irrigation water gradually washed them away and led to the formation of erosion [2, p. 15-23].

Occasionally there are strong winds in the region, which cause the absorption of the fertile layer of the soil, damage and destruction of baby seedlings, and pollution of the environment. Wind erosion is stronger and more frequent in the Caspian zone. Occasional floods in the rivers flowing through the region intensify the washing away of lands.

18.2% of the region's territory is slightly eroded, 5.8% moderately and 2.2% severely eroded.

Results

In order to effectively use the land, we have analyzed the cadastral materials of Khachmaz region and came to the conclusion that if measures are taken in these areas, we can quickly achieve positive results:

1. Implementation of anti-erosion measures is mandatory. Attention should be paid to all soil-protective agro-technical measures to protect soils from erosion and increase their fertility in the arable lands of the region. Plowing, sowing and cultivation should be carried out in a timely manner, and after harvesting the fields should not be burned. The arable field's rotation system should be used as much as possible. If this is not possible, crop rotation should be done in the fields. Mineral and organic fertilizers should be used more efficiently. If possible, forest strips should be laid around the arable fields.

2. Grass cover should be protected in pastures and hayfields, surface and deep improvement works should be carried out, areas should be cleared of large stones, and cattle grazing should be regulated. Seeds of annual and perennial (especially legumes) grasses should be sown in these areas from time to time, and mineral fertilizers, mainly nitrogen fertilizers, should be applied if possible.

3. Measures should be taken to protect and increase forests. Forests should be protected in the forests, debris should be selected selectively, livestock should not be allowed to enter the forest, and periodic restoration work should be carried out. Cutting of bushes and grazing of cattle in bushes should be stopped completely.

4. Drought and salt-tolerant plantations should be planted to prevent the absorption of sand in the Caspian strip. Plowing, sowing and cultivating works in the arable fields of Caspian strip should be carried out in a direction perpendicular to the prevailing winds, and minimal cultivation works should be preferred.

5. Soil salinization must be prevented. The complex of irrigation networks in the region must be reconstructed without delay.

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