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# Aspects of ecological conditions of Sheki and Oguz regions

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A B S T R A C T

At present, the violation of the ecological environment in the country, the reduction of forests, meadows, agricultural lands, the complete destruction of some places, the violation or reduction of biological diversity of some plant and animal species increase the relevance of ecology and environmental assessment.

***Key words*:** Fertility of soils, Agricultural lands, Environmental assessment, Climatic elements.

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## Introduction

The region is located in the north-west of the republic, in the north-west and in the south along the Alazan River in the Republic of Georgia, in the north along the southern slope of the Greater Caucasus to the beginning of the Goychay River in the Dagestan Autonomous Republic, and in the south in the Alazan-Haftaran valley and Samukh in the south. and Agdash and Goychay districts in the south-east.

Covering the administrative districts of Balakan, Zagatala, Gakh, Sheki, Oguz and Gabala, the total area is 883.5 thousand hectares or 10.2% of the country's territory. The relief is mostly mountainous. The mountainous area itself is divided into high mountainous, medium mountainous and foothill zones. In the south, the Alazan-Haftaran valley stretches from west to east, parallel to the foothills. The valley plays an important role in the region's economy due to its agricultural land resources.

The region is characterized by a very complex shape in the fragmented relief of the area, varying in width over a distance of 4480 m to the high Bazarduzu Mountain, which starts at about 100 meters from the shore of the steppe Achinohur. Widespread erosion events also play an important role in the formation of the relief. Frequent floods in the region are due to the location of large river networks and high slopes, as well as high rainfall [1].

Thus, a very complex and sharp change in the relief conditions in the area along the vertical belt has led to the formation of different climate types. Thus, all climatic elements are unevenly distributed in the area due to the increase in altitude from the south-west to the north-east of the semi-desert, dry steppe cold and mountain tundra climate types. According to the climatic indicators of Zagatala meteorological station in the north-west of the area, the average annual temperature is 12.50. The cold season of the year is characterized by 2.10 in winter and 22.90 in the hot season, in summer. In the cold season, the temperature does not exceed 5.60, while in the warm season it reaches 19.40. According to the observations of the Sheki meteorological station in the central part of the area, these figures are slightly different. Thus, the average annual temperature is 0.50 in winter and 0.20-0.40 in summer. In the city

of Gabala, which ends in the east, the corresponding figures are between 0.20 and 21.00, and even the difference in average temperature is 1.90 lower than in Zagatala. The amount and distribution of precipitation in the area are quite different.

While the annual rainfall was 622 mm in Muganli settlement, 1394 mm drop was recorded in Alibey meteorological station located at 1750 m altitude on the southern slope of the range. As can be seen from the figures, the amount of precipitation in the region, as a rule, increases with increasing altitude. Precipitation is unevenly distributed throughout the year. According to the observations, the amount of precipitation in the form of rain in the maximum warm period varies between 408-875 mm, and in the cold period - 214-574 mm. Precipitation in the region, mainly in the hot season, often intensifies the process of erosion and floods in the area. The average annual relative humidity varies between 70-79% between individual points. Evaporation of moisture from the surface is also very different. The highest possible evaporation in the area was recorded at the Muganli meteorological station located on a dry steppe.

## Objects and methods

Like indicators of other climatic elements, the surface temperature of the soil cover in the region depends on the relief structure of the area, vegetation, granulometric composition of the soil, etc. changes depending on factors. Thus, while the average annual surface temperature is 7.00 in Alibey meteorological station, in Gabala and Zagatala this figure rises to 13-150. Even in the cold season, this figure falls to 1.50 in the mountains, and at the same time in the foothills does not fall below a positive 3.70. Similar features are also observed in the dynamics of changes in soil temperature. Thus, in the zones described above, different vegetation is formed depending on the relief and climatic conditions. Acinohur steppe, located in the south of the Alazan-Haftaran valley, has dry steppe and semi-desert vegetation and xerophytic shrubs. Acinohur steppe, which covers the territory of Gakh and Sheki regions, is used as winter pastures. The vegetation of the Alazan-Haftaran valley, which is surrounded by the Acinohur front rock to the south and consists mainly of a lowland, is composed of shrubs and meadows. Crabs grow wild fruits (apple, cherry, mashed, cornel, etc.). Due to the wide use of the valley in agriculture, natural vegetation is poorly developed. In the past, widespread and impassable lowland forests in the valley were exposed to anthropogenic influences over time and were cut down in many areas, and the lands began to be used for agriculture. In some places, the forest cover preserved in the form of steppes now belongs to the state forest fund. Broad-leaved forests are also widespread in the region on the mountain slopes of this part of the Greater Caucasus.

The lower forest belt in the area is located at an altitude of 500-600 m to 900-1000 m above sea level. In these sparsely wooded forests located in the anthropogenic zone, along with hornbeams, oaks, shrubs, hawthorn, mulberry, black currant, cornel, cherry, hazelnut, etc. spread. In the middle mountain range, the bushes are substantially reduced and the predominance of beech trees is observed. The mesophilic beech forest, which covers an area of 1,000 to 1,700 meters, is also home to some species of Caucasian hornbeam and birch[4]. Upper mountain forests are spread at an altitude of 1700-2200, 2400 m. These forests are sparse, short and well developed with grass cover. The southern slopes are dominated by oak forests, while the northern slopes are covered with oak and beech forests. Sometimes spruce is replaced by birch, spruce and maple. Apart from trees of great economic importance in the mountain forests of the region, apples, pears, walnuts, hazelnuts, chestnuts, cornel, raspberries, cherries, hawthorn, etc. wild fruit trees are also widespread. Also very valuable medicinal plants for the pharmaceutical industry in the mountain forests of the region. The high mountain belt of the region consists of subalpine and alpine meadows. Subalpine meadows are rich in species, coniferous and mainly composed of perennials. The evergreen Caucasian rhododendron is found in certain areas on the subalpine humid northern slopes. Subalpine meadows, consisting mainly of tall wild grains and grasses, are replaced by real alpine plants at altitudes of 2500-2600 m. They form grass and stick to the ground in the form of “dots”. That is why they are also called alpine carpets. Alpine meadow plants are short in size and few species. Different types of mosses and sedges are spread in the snow-covered heights of the area. Only a small amount of mountain rocks or sparse low-growing grasses grow among the eroded rock fragments are found here.

## Experimental part

Alpine meadows are a valuable and useful pasture for sheep. The current condition of most pastures in the region is very bad. Thus, the biological productivity of summer pastures decreases from year to year. The geobotanical composition of the grass cover is deteriorating. The area of eroded areas continues to expand from year to year.

Thus, the vegetation formed in the zones described above, depending on the relief and climatic conditions of the area, also determined the distribution of soils according to the law of horizontal zoning [6]. The composition of the land cover of the region, which does not have such large land reserves, consists of different types and subtypes of soils.

**The composition of the land cover of the region**

| Number | Type and subtypes | Area | |
|---|---|---|---|
| | | ha | % |
| **1** | **2** | **3** | **4** |
| 1 | Primary and peat mountain-meadow | 37092 | 4,2 |
| 2 | Grassy mountain-meadow | 40778 | 4,6 |
| 4 | Steppe mountain-meadow | 12576 | 1,4 |
| 5 | Meadow mountain-forest | 5938 | 0,7 |
| 6 | Tipical brown mountain forest | 153681 | 17,4 |
| 7 | Carbonate residue, partially deserted brown mountain-forest | 89506 | 10,1 |
| 12 | Washed brown mountain forest | 31472 | 3,6 |
| 13 | Typical brown mountain-forest | 6606 | 0,7 |
| 14 | Carbonate and partially deserted brown mountain-forest | 3394 | 0,4 |
| 15 | Washed and typical mountain-black | 6872 | 0,8 |
| 16 | Carbonate mountain black | 22790 | 2,6 |
| 18 | Light mountain gray-brown | 18110 | 2,0 |
| 19 | Dark and ordinary mountain chestnu | 6032 | 0,7 |
| 20 | Partially humus-sulphate (calcareous) and underdeveloped mountain chestnut | 7745 | 0,9 |
| 21 | Typical and carbonated meadow-brown | 41735 | 4,7 |
| 24 | Dark and ordinary chestnut | 23747 | 2,7 |
| 25 | Partially residual salted light chestnut | 46979 | 5,3 |
| 29 | Typical gray | 4988 | 0,6 |
| 30 | Light and primitive gray | 7375 | 0,8 |
| 34 | Partly saline and saline-gray | 7002 | 0,8 |
| 35 | Washed and carbonated (tugai) meadow-forest | 171138 | 19,4 |

| | | | |
|---|---|---|---|
| 36 | Alluvial-meadow | 69682 | 7,9 |
| 37 | Meadow-swamp and swamp | 3944 | 0,4 |
| 38 | Salts (deluvial, alluvial and sopkali) | 6795 | 0,8 |
| 43 | Gravel-stone river deposits | 23981 | 2,7 |
| 44 | Bare rocks and various rocks on the surface | 33533 | 3,8 |
| | **Total** | **883491** | **100** |

Up to 54% (476.1 thousand ha) of land resources are distributed in mountainous areas, 46.0% (407.4 thousand ha) in the plains and especially in the Alazan-Haftaran valley. About 30.0% (291.0 thousand hectares) of the total land fund of the region consists of mountain and forest lands. Types and subtypes of brown mountain-forest soils occupy a wider area due to their distribution area. The area of brown forest lands together with meadow mountain-forest lands is 249.1 thousand ha or 52.3% of the total mountainous lands. Types and subtypes of brown mountain-forest soils distributed in relatively limited areas are equal to 8.7% (41.5 thousand hectares) of the forest land fund of the region.

Different types and subtypes of meadow lands of subalpine and alpine meadows, distributed in the high mountain belt of the region, which is of great importance in agriculture, especially in the development of sheep breeding, cover 10.3% (120.5 thousand hectares) of mountain lands. Bare rocks and various types of rocks that form a unique natural landscape in this zone occupy about 4.0% (33.5 thousand hectares) of the land fund of the mountainous area [5].

Widespread types and subtypes of mountain-black, mountain gray-brown and mountain-chestnut soils, widely used in the development of grain, fruit, cocoon, livestock and other agricultural sectors in the region and characterized by potential fertility, account for about 7.0% of the mountain land fund. (61.6 thousand hectares). 46% (407.4 thousand hectares) of the total land resources of the region are located in the plain zone of great economic importance, and especially in the Alazan-Haftaran valley. Some of the meadow-brown, chestnut, gray, gray-brown alluvial-meadow, meadow-swamp lands spread in the area are now widely used in agriculture of the region. The rest of these lands have been exposed to the negative effects of natural and anthropogenic processes over the past period - salinization, salinization, swamping, erosion, landslides, etc. cases. As a result, lands with deteriorated general reclamation status were excluded from agricultural turnover due to loss of fertility properties.

At present, 45.7% of the total land resources of the region (403.4 thousand hectares) are involved in circulation as they are completely suitable for agriculture. 44.8% of this (180.9 thousand hectares) covers arable and reclaimed lands. The area under perennial crops reaches 10.3% (41.4 thousand hectares). Most of the agricultural lands in the region are grazing and pasture lands, accounting for about 39.8% (160.8 thousand hectares). Currently, backyard lands cultivated as arable land make up 4.7% (19.0 thousand hectares) of the total agricultural land. Forest lands cover 30.9% of the area (272.7 thousand hectares). Other lands that are considered impossible to use in agriculture cover 23.4% of the total land fund (207.4 thousand hectares).

## Results and its discussion

The production of crop products in the region is mainly obtained on irrigated lands up to 105.6 thousand hectares. At present, 26.6% of agricultural lands are irrigated. Of this, 73.2% is irrigated arable land and 9.8% is perennial crops. A small part of pastures and grazing lands, ie 1.7% (1.8 thousand hectares) is irrigated.

Natural and anthropogenic processes, which have a strong impact on the formation of the total land cover in the region, have also affected the quality parameters of lands used in agriculture for a long time.

Only 14.3% (57.5 thousand hectares) of agricultural land in this area is of high quality. 39.2% of this (18.9 thousand hectares) is backyard land. The fact that a small part of the vital arable and fallow lands in the region, about 10.0% (18.0 thousand hectares) and its main mass is in the II and III quality groups, shows that the reclamation

status of these lands has changed in an insufficient direction. The concentration of 40.5% of perennial arable lands in the good quality group indicates that the fertility properties of these soils are in good condition compared to arable and fallow lands. Certain signs of degradation are also observed in hayfields. In the past, arable lands with a small area had to be included in the high-quality group. However, due to the lack of proper care for hayfields, as well as other land plots, it reaches 27.2% (04, thousand hectares) in the average quality group.

Transfer dynamics have become more serious in pastures and grazing areas. Thus, 65.3% (64.1 thousand ha) of the total pasture area of about 98.2 thousand hectares was transferred to quality groups III and IV as a result of intensive exploitation of canine grazing lands. This is also reflected in the dynamics of the distribution of the quality group of summer and winter pastures. Only 4.5% of the total area of summer and winter pastures (2.9 thousand ha) was in the first quality group, and 18.8% (18.0 thousand ha) was in the second quality group. The transfer of the remaining 66.7% (41.6 thousand ha) to quality groups III and IV indicates a strong process of degradation in pasture lands. The dynamics of transfers in the quality group of agricultural areas in different regions of the region is characterized by instability. Transfers are stronger and more intensive, especially in pastures. Sheki is located at an altitude of 500-850 m above sea level. The height of snowy peaks of the Main Caucasus Range reaches 3000-3500 m in some places. Jurassic, Cretaceous, Neogene and Anthropogenic sediments are spread in the mountains. Sheki is located in the north-west of Azerbaijan, on the southern slope of the Greater Caucasus Mountains, at an altitude of 632 m above sea level. It has abundant water resources, normal moisture balance, fertile soils and rich forest cover.

Brown mountain forest, brown mountain forest, meadow forest, gray-brown soils are widespread. Oak, beech and walnut trees predominate in the forests. The fauna is rich [3]. As a result of charming nature, unique historical and architectural monuments, developed craftsmanship, protection of rich historical and cultural heritage, Sheki has become an important tourist region of Azerbaijan. According to the research, starting from the watershed of the Greater Caucasus tribe in the region, in the areas included in the Alazan-Haftaran valley and the northern slope of the Sheki plateau, mountain meadow-grass, mountain meadow-forest-like, mountain meadow-forest, mountain forest-brown, mountain forest, alluvial-meadow, meadow-swamp, mountain black and mountain chestnut soil types have been identified. The mountain-meadow lands cover a relatively large area in the north-eastern part of the region in the border zone with the Gabala region and extend to the west in the form of a strip cut by river valleys to the territory of Bash Dashagil village [8]. Mountain-meadow lands cover an area of 12,000 ha between 2000-3000 m above sea level in the watershed and adjacent alpine and subalpine zones.

The area of mountain meadow-forest lands is up to 3,000 ha, formed at an altitude of 1800–2100 m above sea level in the upper border of the forest and inter-forested steppe areas, under sparse beech forests and subalpine meadows on clay products.

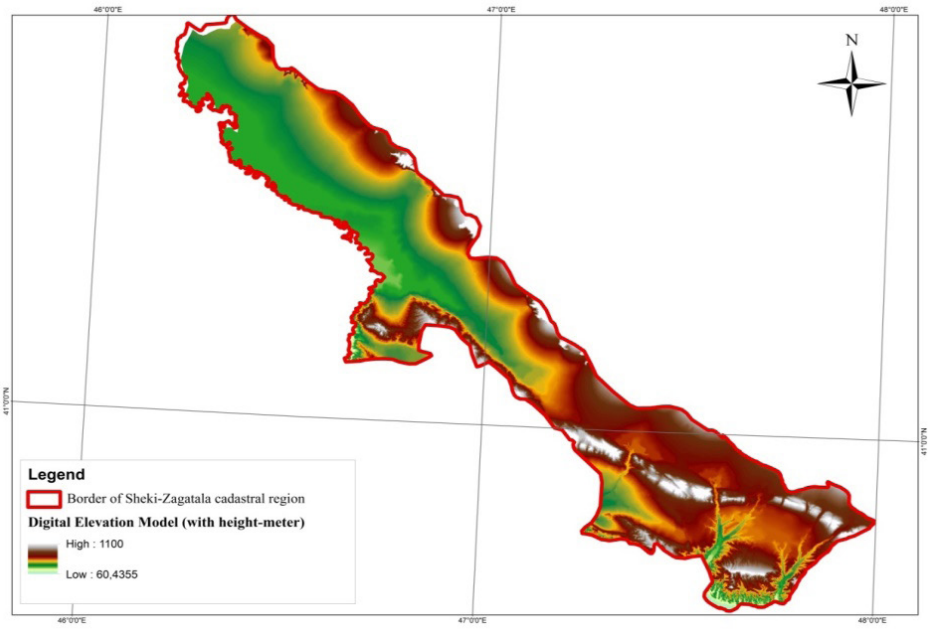
Mountain brown-forest soils are spread along the Dashagilchay, Agligchay and Galachay basins, between the heights of 1100 m to 2200 m above sea level and cover an area of 26,000 hectares. These soils are characterized by a dark and broad humus layer of thick forest floor, good water collection capacity and high humus content (8.0 - 15.0%), heavy clayey mechanical composition and richness of ash elements. Mountain forest-brown soils in the surrounding areas of Calut, Khalkhal and Khachmaz villages at an altitude of 500-1200 m above sea level, in relatively temperate and dry climates, under oak forests, shrubs and grasses, separate spots, strips and stripes on carbonate clay erosion products spread in the form of [1].

In the territory of Oguz region, in a wide alluvial plain cut by many branches of Dashagilchay, Khalkhalchay, Alijanchay, Agchay, included in the eastern end of Alazan-Haftaran valley, Bujag, Gumlag, Karimli, Padar, Xinjiang, Mollali and others. Alluvial-meadow lands are spread around the villages, and meadow-swamp lands are spread in small areas in the territory of Bayan and Gumlag villages. Part of the alluvial meadow-forest lands is under Tugay forests, and part of it is used for low-yielding hay and irrigated vegetable crops. Alluvial meadow-forest, alluvial-meadow and meadow-swamp soils are relatively close to each other by forming a complex according to climatic indicators, relief conditions, nature of soil-forming rocks, hydrogeological condition and usage characteristics. grass plantings, etc. They are suitable for the development of farms. The southern and south-eastern part of the region covers the weakly sloping northern slope of the Sheki plateau. In the territory

of Yagublu, Yenikend, Boyuk Soyudlu villages and on the northern slope of the Dry Kahriz tribe, along with the usual hardened and carbonated, mountain-black soils, dark chestnut and chestnut soils are also spread in small areas. Mountain-black and chestnut soils are suitable for irrigation and drip cultivation and are characterized by high productivity. 36.5% of the total land area of the region, ie 44,492 hectares are suitable for agricultural areas. 18,183 hectares of land, or 15.8%, are irrigated. 46.6% of the total land fund in the district belongs to the state property, 8.1% to the municipal property, 45.2% to the private property. 15.8% of the total land fund is suitable for planting [2].

## Conclusıons

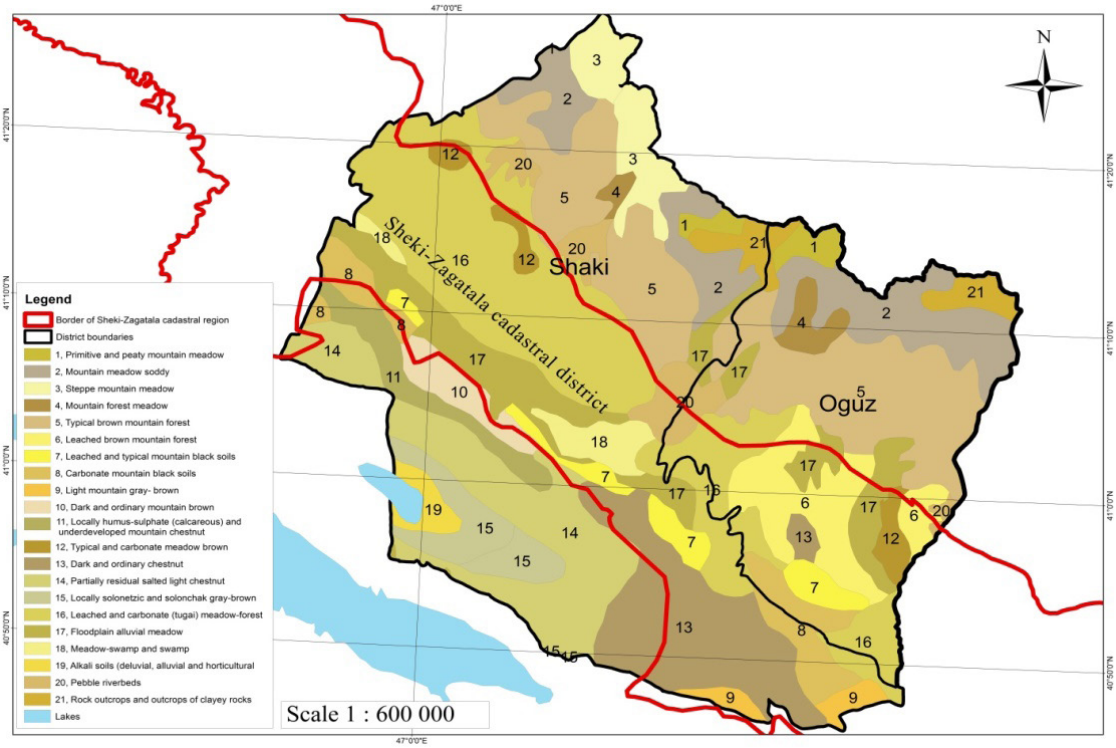
On the basis of GIS, the initial version of the elevation model (demin) of the area, the land map was prepared. The very complex and sharp change in the relief conditions in the area along the vertical belt has led to the formation of different climate types here. Thus, all climatic elements are unevenly distributed in the area due to the increase in altitude from the south-west to the north-east of the semi-desert, dry steppe cold and mountain tundra climate types. According to the climatic indicators of Zagatala meteorological station in the north-west of the area, the average annual temperature is 12.50. The cold season of the year is characterized by 2.10 in winter and 22.90 in hot summer. In the cold season, the temperature does not exceed 5.60, while in the warm season it reaches 19.40. According to the observations of the Sheki meteorological station in the central part of the area, these figures are slightly different. Thus, the average annual temperature is 0.50 in winter and 0.20-0.40 in summer [7]. In the city of Gabala, which ends in the east, the corresponding figures are between 0.20 and 21.00, and even the difference in average temperature is 1.90 lower than in Zagatala. The amount of precipitation in the area and the distribution regime are quite different. Different vegetation is formed in the zones depending on the relief and climatic conditions. Acinohur steppe, located in the south of the Alazan-Haftaran valley, has dry steppe and semi-desert vegetation and xerophytic shrubs. We have compiled a digital territorial model map of the Shek-Zagatala cadastral region. Based on this, it was determined that the maximum height of the study area is 1,100 meters, and the minimum height is 60 meters. We have also developed a trend map based on a digital area model. Based on this, it can be said that the lowest indicator in the study area was 0, the highest was 740.




Soil types and subtypes in the territory of Sheki and Oguz districts are given below.

1. Primary and peat meadow
2. Grassy mountain-meadow
3. Steppe mountain-meadow
4. Meadow mountain-forest
5. Typical brown mountain-forest
6. Washed brown mountain-forest
7. Washed and typical mountain-black
8. Carbonate mountain black

9. Light mountain-gray brown
10. Dark and ordinary effortless
11. Partially rotten - sulfate and underdeveloped mountain chestnut
12. Typical and carbonated meadow brown
13. Dark and ordinary chestnut
14. Partially humus-sulphate (lime) and immature mountain chestnut
15. Partially saline and saline grayish-gray and gray-brown
16. Washed and carbonated (tugai) meadow forest
17. Subasar alluvial meadow
18. Meadow swamp and swamp
19. Salts (dulluvial, alluvial and sopkali)
20. Pebble river deposits
21. Bare rocks and exposed clayey rocks

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