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## Review Article

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## Features, Nature and Economic Conditions of Azerbaijan

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### Abstract

Natural and economic conditions in Azerbaijan are very complex and peculiar. Up to 60% of the entire territory of Azerbaijan is occupied by mountain and foothill zones, the remaining part are (42.8%) plains and lowlands. High mountains, intermountain depressions, valleys, volcanic highlands, which were formed during the geological epoch, cover the territory of the republic. On a relatively small territory of the republic, there is a whole complex of deposits. The features of the geological structure and the available material on the tectonics of the whole territory of the republic make it possible to restore the history of the development of its relief from the early geological epochs. In the Greater and Lesser Caucasus, the geological history of relief development can be traced from the Upper Jurassic, in Talysh from the beginning of the Paleogene, in the Nakhichevan Autonomous Republic from the Paleozoic, which is confirmed by the investigations of B.A. Antonova, B.A. Budagova at the beginning of the Oligocene, early Miocene tectonic processes are intensified and as a result, in all folded surfaces, an increase in land occurs. In the Greater Caucasus, the Gusar and Tfan uplifts increase and in their troughs, there is accumulation of clay. In the Lesser Caucasus, along with clays, there is an accumulation of sands, gravels and conglomerates, sediments characteristic of river valleys when they leave the mountains and much more.

**Keywords:** Activation of Volcanism; Erosion; Equal; Geological Epoch; Hollows; Lowlands; Mountain Ranges; Natural-Climatic; Relief; Valleys; Volcanic Highlands

### Introduction

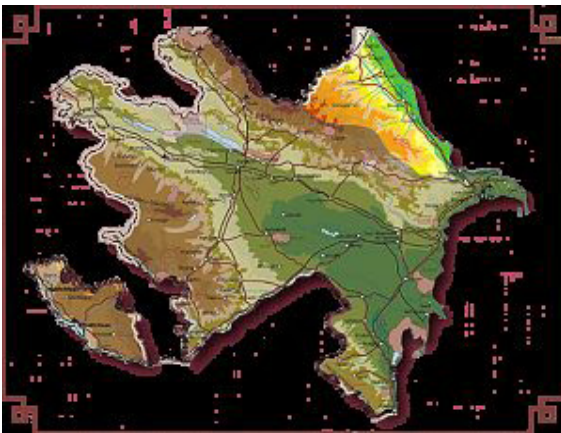


Figure 1: Geographical Map Republic of Azerbaijan.

Square area of the Republic of Azerbaijan is 86.6 thousand km<sup>2</sup>, the population is (January 1, 2018) over 10.0 million people. Azerbaijan is situated on the western shore of the Caspian Sea. The length of the coast of the Caspian Sea in Azerbaijan is 713 km. Azerbaijan is an important transportation hub of commerce and of the “Great Silk Road”.

Azerbaijan occupies the North-Western and South-Eastern parts of the Caucasian Ridge. The borders of the Republic of are: Republic of Dagestan in the North, part of the Russian Federation, with the West-Armenian and Georgian Republic, East-Caspian Sea, to the South it borders Iran and Turkey. The territory is divided into five major natural-economic zones: Greater and Lesser Caucasus, Lenkoran and zone located between them extensive Kura-Arax economic zone, Nakhchivan natural economic zone, which consist of 10 natural-economic regions, Absheron economic region, Guba-Khachmaz economic region, Shaki-Zaqatala economic region, a mountainous Shirvan, Ganja-Gazakh Lachin economic region-Lachin economic region, the Upper Garabag, Aran economic region, Lankaran-Astara economic region, Nakhichevan.

Within Azerbaijan is the South-Eastern part of the Greater Caucasus. From the top of great Teen-Rosso-to the top great Babadag stretches the main Caucasian Ridge, East of Babadag goes downgrading Ridge to the Caspian Sea. The highest peaks of the Caucasus Mountains in Azerbaijan are g. Bazaar-borrowed by Bazarduzi mountain (4489 m), g. Tfan (4197 m) covered with eternal snows. In the southwest of the main Caucasian Ridge breaks off to Ganykh-Agrichajskoj Valley where the rivers converge, carrying water from the ridge to the South of the Valley foothills are located. In the South-East of the large Caucasus is Absheron peninsula and adjacent foothills of Gobustan.

The highest peaks of the Caucasus mountains in Azerbaijan is the Bazar mountain, borrowed by Bazarduzi mountain (4489 m), Mount Tfan (4197 m), covered with eternal snows. In the southwest of the main Caucasian ridge, it breaks up to the Ganych-Agrichay valley, where rivers that transfer water from the ridge to the south of the foothills of the valley converge. In the south-east of the large Caucasus is the Absheron Peninsula and the adjacent foothills of Gobustan. To the north of the main Caucasian Ridge stretches the lateral Ridge, within Azerbaijan its eastern part. High peaks of g. Shakhdag (4251 ft) are covered with glaciers. Lateral Ridge gradually descends in a south-easterly direction and ends at the apex of Beshbarmak. From the northeast to the Lateral Ridge abuts the sloping plain and merges with the Samur-Devichinskoy lowland.



**Figure 2:** Map of research objects on the study of erosion hazard of soils in Azerbaijan.

The Lesser Caucasus area located southwest of the Kur The highest peaks of the Caucasus mountains in Azerbaijan is the Bazar mountain, borrowed by Bazarduzi mountain (4489 m), Mount Tfan (4197 m), covered with eternal snows. In the south-west of the main Caucasian ridge, it breaks up to the Ganych-Agrichay valley, where rivers that transfer water from the ridge to the south of the foothills of the valley converge. In the south-east of the large Caucasus is the Absheron Peninsula and the adjacent foothills of Gobustan. basin. Within Azerbaijan here stand out the Shakhdag, Murovdagskij, Zangezur, Nakhchivan and Daralagezskij ridges, as well as Garabahskoe volcanic mountain.

The South-Eastern part of the country occupied by Talysh

mountains with longitudinal ridges: Burovar, Peshtarskij, Talysh. In this zone, but Midland terrain mountainous part of numerous ridges, and this causes the formation of intermontane hollows. Lenkoran lowland is a sloping plain. Formation of the relief happened under the influence of the regressions of the Caspian Sea and the accumulative revenue of material from the mountains. Unlike major and minor Caucasus, this area has not been frozen chetvertichnomu quaternary.

On the territory of the Nakhichevan Autonomous Republic are Zangezur and Daralagezskij ridges. Along the crest of the Zangezur mountain range forms the border between Armenia and Nakhchivan Autonomous Republic. Climatic conditions in Azerbaijan are complex and peculiar. More than half of the territory of Azerbaijan (58%) covered by mountains, the remainder (42.8%) Plains and lowlands of the Azerbaijani territory with high mountains, Intermountain Hollows, valleys, volcanic Highlands formed over geological periods. The relatively small area the Republic has a whole range of deposits. Features of geological structure and available material on tectonics the entire territory of the Republic gives the opportunity to restore history to its relief from earlier geological eras.

On the big and small Caucasus, geological history traces the development of the relief from the upper Jurassic, Talyshesince the beginning of the Paleogene in Nakhchivan Autonomous Republicwith the Paleozoic. A. research Antonova, B.A. Budagov [1] at the beginning of the Oligocene early Miocene tectonic processes and as a result all folded surfaces increase the sush. In the Greater Caucasus is increasing, raising Tfan Kusar and their deflection is the accumulation of clay. On small Caucasus along with clays is the accumulation of sand, gravelitov and conglomerates, sediment characteristic of river valleys when leaving the mountains. It is said that already at that time on small Caucasus existed river network.

A significant part of the Kur basin was a saltwater pool, inside of which were located on the island. In the formation of Oligocene sush in Talyshes, the central part of the falls, is the accumulation of a powerful, layers of Maikop retinue, Yardimli, education Peshtasar, Burovaskogo ridges. In the middle and late Miocene development relief Azerbaijan intensifies. Central Vandamskoe lifting and separating their Zakatalo-Kovdag perp has already represented the middle ranges, fragments of which are preserved in the modern relief. In the relief of Gusar, also Beshbarmaq breached the uplift. On average, Miocene and small Caucasus change occurred. This is evidenced by the presence of sandy material layer of pebbles of conglomerates.

On small Caucasus Murovdagskij, Miocene average Garabakh, Zangezur ridges obviously exceed the height of the Midlands and the Shakhdag and Daralagezskij Ridges do not reach the Midlands. According to B.A. Budagov, G.A. Khalilov in the early late Miocene in the Greater Caucasus expands transgression of the sea. In the early Pliocene formation of mountain constructions of major and minor Caucasus, Talysh continues. In relation to the tectonic Tfansko -Dibrarskaja-raising land is exempt from the sea.

On the big Caucasus there was already a terrain that stretches to the town of Babadag. Marine pool occupied southeastern Shirvan.

In the formation of the relief of the Lesser Caucasus, Nakhichevan AR, Talish in the early Pliocene major changes occurred. Tectonic processes during this period are expressed in raising major mountain ranges and the revitalization of the volcanism of the Karabakh Highlands. From this period also involves the formation of the South the Caspian basin and the formation of the Lankaran lowland.

Late Pliocene-beginning of a new era that is associated with the transgression sea, oceanic water erupts in the Caspian basin and form extensive bays. During the Pleistocene period a sharp climate change and this entails strengthening the tectonic processes of growth of the height of the mountain facilities, increased sedimentation, terrigenous material and the alternation of transgressions and regressions of the sea. In the Experimental, zone formed band proluvialno-deljuvialnoj plain. In the lower reaches of the rivers Bolgarchaya, Viljashchaya and other rivers formed cones.

Mountain building of the greater and Lesser Caucasus continued to be formed and purchased the modern shape of the Caucasus Highlands in this period reached a height of 4000 m. In the field of Garabahs Highlands volcanic activity was evident. The lava formed either step or plateau flows down the valleys of Tartar, Bazarchayja, Arpachay. In mountainous parts of the greater and Lesser Caucasus developed mining and Valley glaciers.

On the territory of the greater and Lesser Caucasus folded Jurassic and chalk slates meet, Sandy limestones, sandstones, limestone's, collected into complex folds. In the South-Eastern Caucasus developed deposits of chalk, represented by clays, limestones. On the territory of the Nakhichevan AR Miocene deposits denominated saliferous thickness. According to M.A. Kashkaja [2] Middle Devonian coral limes volcanogenic tones, sandstones, and Shales represent sediments. Upper Devonian sediment is sand; these are sandstones, shales, quartzite. The power of these deposits amounts to 1100 m. Perm deposits consist of Marly limestones with a capacity of several tens of meters. On the territory of the greater and Lesser Caucasus, meet Jurassic deposits. This argillites, sandstones are found in high jure volcanogenic rocks in the upper jure-carbonate. Alluvial, alluvial debris and marine Quaternary sediments fold lowland territories of Azerbaijan.

## Climate

Azerbaijan, as a mountainous country, at the same time has extensive lowlands, valleys and in connection with a variety of surface topography has a varied climate. From the invasion of cold air masses from the North of the Republic protects the main Caucasian Ridge. Depending on the height above sea level, climatic conditions Azerbaijan vary. With the show in the mountains the average temperature falls. Of the 11 installed on globe main climate types according to E.M. Shihlinskogo [3,4] 8 types found

on the territory of the Republic, namely:

### Climate Semi-desert and Dry Steppe

It is endemic to the territory of the Kur depression, Ganja-Gazakh array and the Near the Araksinsky lowlands area of Nakhchivan. This region is characterized by hot summers, mild winter with little rainfall from intense evaporation. The air temperature ranges from +12 to -15°. Months of July and August is hottest months, January-the coldest month. Rainfall ranges from 430 mm-185, relative air humidity from 50-60% in summer, 75-80%-during the winter months. Northern winds are found on the Absheron peninsula in all seasons; sometimes reach hurricane force (Baku Nord or "Khazri"). These winds blow in the summer of 2-3 days.

### Warm-temperate Climate with Dry Winters

Characteristic of mountain zones of southern slope of Great Caucasus (1400-2000 m), Alazan-Avtoran Valley (200-500 m) and the eastern slope of the Lesser Caucasus (1400-1500 m), this region is temperate moist, mild winters and moderately hot summers. Such a climate favorable for cultivation of cereals, grapes, also to the spa zone (Roads, Sheki, Zagatala, Ajikend).

### Warm-temperate Climate with Dry Summers

Inherent in the Experimental area. Mild, wet winters, moderately hot, dry summers, and rainy autumn. Rainfall reaches 1300 mm per year. This climate is called wet-subtropical, is favorable for cultivation of citrus fruits, tea and fruit-melons.

### Cold Climate with Dry Winter

Typical Alpine and mountain area of the Lesser Caucasus and (1500-2700 m) and North-eastern slopes of the Greater Caucasus (1000-2700 m). This region due to the cool summer, a harsh winter, a large number of solar radiation and the presence of mineral springs suitable for sanatoriums and holiday homes (Lake Gek-Gel, Istisu).

### Cold Climate with Dry Summers

Inherent to the mountain zone of Nakhchivan. Compared with the Near the Araksinsky stripe there is more moisturizing, less hot summers, more cold and snowy winter.

### Warm-temperate Climate with Uniform Precipitation

Noted in the forest zone of southern region (600-1500 m) and North-eastern slopes of the Greater Caucasus (200-500 m). Mild winters and moderately hot summers.

### A Cold Climate with Abundant Rainfall

Found in the Alpine zone of the greater and Lesser Caucasus.

## Vegetation

Vegetation of Azerbaijan is very varied. On the territory of the Republic has around 4100 vegetation types. Vegetation is

distributed on tall steps depending on zonal changes in climate and soil, i.e. According to the law of vertical and horizontal zonation. Throughout the history of the flora was subjected to changes, i.e. Since the Cretaceous era to the present day due to changes in physical and geographical conditions, vegetation of Azerbaijan had changed. Historical Geology data show that at the end of the Cretaceous and early tertiary epoch of the Caucasus was an island with a humid climate.

The area was covered with lush evergreen vegetation, but this ancient vegetation has not survived to the present day and in the tertiary period was expelled. Glacial period introduced new changes to vegetation. With the retreat of the glaciers, forest vegetation occupied the mountain slopes. This vegetation, a few vidoizmenivshis video-modified, has been preserved to our time.

In the modern vegetation of Azerbaijan, you can highlight certain types of landscapes and vegetation. For example, the Kur depression, Absheron, South Mughan, Samur-Devechi lowland, Priaraksinskoj under the Araks plain and Foothill semi-deserts.

Within Azerbaijan at an altitude, 1500-2000 m above sea level vegetation is represented by broadleaved forests. They include: Georgian oak, hornbeam, Linden, maple, in the lower parts of the belt include chestnut, Caucasian persimmon. srednegornogo forests belt: predominate East beech, hornbeam, maple, ash, Linden. In the western slopes of the bushes *Rhododendron luteum*, on East Juniper *juniperus* Climbing even higher. These include Georgian oak, hornbeam, linden, maple, in the lower parts of the belt - chestnut, Caucasian persimmon. Middle forest canvas: Oriental beech, hornbeam, maple, ash, linden predominate. On the western slopes of rhododendron luteal bushes on the eastern juniper rises even higher. characteristic of the zone of East oak forest (*Quercus macranthera*) forms the Park oak.

Subalpine vegetation is divided into 2 zones: lower, upper. The lower notes, from 1600 to 2000 m above sea level. This includes forest edges, clearings. Dominated by subalpine, poslelesnye, post-forest tall, plains and meadows. Upper zone within heights from 2000-2700 m above sea level. It is dominated by the motley ostepnennye desertification position meadows and steppes. Above 2600-3200 m Nival belt with cold climates are almost devoid of vegetation.

Lankaran-Astara region depending on the humid-subtropical climate vegetation has a specific species composition. A study of the flora of this region led to a study of AA. Grossheim [5] and L.I. Prilipko [6]. The main breed of Lenkoran lowland forest area is Demir-Agach (*Porrotia persica*), hornbeam (*Carpinus caucasica*). As Bush advocated shrubs of Hawthorn (*Crataegus* sp.), Ruscus (*Ruscus hyrcanus*), medlar (*Mespilus germanica*). In lowland forests at the edges and glades grow vines, silk Acacia (*Albizzia julibrissi*).

Vegetation of Nakhchivan also formed depending on the climate. According to Li Prilipko all with Arax lowlands and foothills takes wormwood semi-desert. Rising above the

predominant vegetation of lugovostepnogo meadow-steppe nature. In the area of the Highlands on the slopes of vegetation does not form a closed cover. Intervals between shrubs and trees are occupied by the lush, lush meadows, dry meadows, depending on the steepness of slopes and soil cover. Vegetation is one of the main factors of the soil-process. Decaying plants accumulate a large amount of soil organic matter. Depending on soil organic matter enrichment, S.A. Zakharov allocates 3 type of vegetation: wood, Cliff, travjanistuju herbaceous.

Wood, i.e. forest vegetation occupies a large area and rises to a height of 2700 m above sea level. m on the southern slope of the main Caucasian Ridge and alazan-Avtoranskoj Valley forests occupy almost 34% of the area. In the north-eastern slope and 13.8% of the Caspian depression. The Absheron peninsula, Gobustan belong to treeless areas. In Guba-Khachmaz zone large space occupied by forests of oak, poplar, hornbeam, Elm, mulberry. Compared with forest shrub takes a smaller area. Woody shrubs such as: Hawthorn, dogwood, medlar, a dogrose, a sloe found on the edges of forests. Other shrubs, rhododendron derzhitree, Astragalus, Juniper took steppe and semi-desert area.

By type of grassy vegetation S.A. Zakharov and B.A. Aliyev distinguishes semi-desert, desert, steppe, meadow, Sandy, Rocky, swampy. Steppe vegetation covers Shemakha Highlands, meets on Guba-Gusar plain. Among the mountain-steppe vegetation representatives of legumes, with the deep root system, form the high grass. Among the most common encounters, sweet clover, sainfoin clover, vetch, chick peas.

## The Soil Cover

Formation of the relief, climate and human activities affect the appearance of the soils of Azerbaijan. The soil is represented by all major soil types and obeys the law of horizontal and vertical conation. Among the factors of soil formation plays an important role in relief, because the vertical soil zones are in direct dependence on the vertical zonation, climate and vegetation. In the mountainous part of Azerbaijan nature of the terrain is very difficult and this is the reason of runoff of surface waters. On the supervision of G.A. Aliyev [7] very often with mountainous part-sloping plain carried products of weathering.

In the mountainous part of the greater and Lesser Caucasus common mountain-meadow soil, where the soil-forming process takes place under the influence of grassy vegetation. These soils are well expressed in the humus horizon. Alpine region occupied by sub-alpine and alpine meadows, is a rich pasture [8-10].

**Brown Mountain-Forest Land:** Ozone of Northern and North-eastern slopes of the Lesser Caucasus, the southern and northern slopes of the main Caucasian Ridge formed under the beech and hornbeam-beech forests.

**Brown Mountain-Forest Land:** Are located under the cover of dry forest with dense grass stand. 3-4% content of humus, humic acids predominate over fulvoacids-alkaline reaction.

**Soil Dry Steppe:** Gray-Brown Earth soils desert steppes, occupy a strip of the foothills and low mountains with moderately warm and moist climate, where poluvlazhnyy semi-moist dominates steppe vegetation. Gray-Brown Earth well humidified flowing from the slopes atmospheric precipitation. Named soils developed in deluvial rocks and forests, they have good moisture-holding capacity and provide vegetation moisture. Grey-brown soil of Nakhichevan AR compared to other areas of Azerbaijan contain less humus.

**Gray:** In stretchajutsja on the Kur depression, Nakhichevan AR on the flat part in terms of climate poluaridnogo semi-arid. Depending on soil conditions, the nature of the species, salinity, they are divided into subtypes. Since the climate in the grey zone of soil is characterized by hot and dry continental climate vegetation of this zone is poor and does not form a continuous turfing. Accumulation of humus is negligible. Saline and alkaline soils develop in terms of climate semi-arid poluaridnogo [11,12].

These soils contain in their profile highly soluble salts in toxic for crops. The formation of saline soils is associated with the accumulation of salts in groundwater and rocks and the conditions conducive to their accumulation in soils. Common in Mil, Shirvan, Salyan Plains.

Soils of Floodplain Soils of the Flood develop on river valleys. Alluvial and alluvial-forest soils with the participation of their river are created. It should be recognized that alluvial soil provides natural fertilizer, the more fertile the food, the more it develops natural vegetation in the floodplain. [r azvivajutsja] has evolved on river valleys. Is alluvial and alluvial-forest soils have been formed with the participation of the they fluvial. Alluvial provide natural fertilizer than plodorodne napilok is, the more it develops natural vegetation in the floodplain.

Soil Moist Subtropical Climate common in Lankaran region, mainly zhovtozemah, yellow earth, poor in humus with sour reaction, slightly opodzolennaja podzolic are polyvalent metals (Fe, Al). In a small number of Experimental zones there are also red soils. It has been established that these soils have developed on the krasnocvetnoj red crust of weathering on damp subtropics with a predominance of podzolicstogo process, characteristic in acidic Wednesday. But on the other hand signs podzolic opodzolivanija manifested not clear-cut, since decomposition of organic substance formed a large number of bases and neutralizes the acidic reaction.

## Hydrography

Hydrographic network in Azerbaijan formed over a long period and of tectonic processes experienced various changes. Under human activities and natural processes, it and now continues to change. In the Republic of nachityvaetsja 1000-1200 rivers in General, most of them long, or more than 100 km-21, from 5 to 100 km-67 rivers, length of 5 km and less-850 rivers.

All the rivers in the Republic belong to the basin of the Caspian Sea. They can be divided into three groups:

- a) Kura river basin
- b) river basin of the Aras,
- c) River directly flowing into the Caspian Sea.

River network is distributed unevenly in the territory of the Republic. In the mountains the hydrographic network strongly developed, depending on the terrain and abundance of precipitation. The greatest development of the hydrographic network reaches at altitudes of 1000-2500 m, medium mountain zone.

The largest water artery of Azerbaijan-Kura, within the Republic of its length is 900 km. It originates in Turkey, the length of the river is 1072 km. Between the main Caucasian Ridge and Lesser Caucasus is the Kura-Aras lowland, which carry their waters Kura and Arax.

According to the method of feeding the River are divided into

- a) Snow-soil.
- b) Rain-soil
- c) Soil-rain.
- d) Soil-snow.

The first type consists of r. Kura River with highly located watershed. They belong to the North-East and the southern slope of the main Caucasian Ridge. [This Samur, Gusarchay and Turyan tributaries of the river Gumchai, Damiraparanchay. On these rivers rain feeding. The second type are the low-lying River watershed. Such rivers are found in the major and minor Caucasus and Lankaran region]. These are the Samur, Gusarchay and Turian tributaries of the Gumcha River, Damiraparanchay. On these rivers, rainy tributaries are fed. And the second type is the low-lying river watershed. Such rivers are found mainly in a small region of the Greater Caucasus and Lankaran. This is Divichichay, Ahchaj, Shabbranchay, Kuruçay, flowing with Lateral Ridges North-East slope of the Great Caucasus and also the river current to Kobustanu. Tugchay, Atachay Rivers Traverse. Tea.

Here snow food is 5%. In the small Caucasus among rivers, with rain-soil nutrition include the rivers: Tauzchay, Ahyndzhchay, Dzhagirchay, Qarqar River, Kendelenchay, Kuruçay. A third type of food-soil-rain fall River, flowing from the South and the north eastern slopes of the main Caucasian Ridge, it is Dashagylchay, Aldzhiganchay, Turyan, Goychay, Velvelichay, Karachay. These River obvodnjajutsja supply with water at the expense of emerging on the surface of the groundwater. Here snow eating-not more than 20%. Republic of Lakes is poor. Largest of them is Lake Adzhikabul, Sarysu, Akgel. The most beautiful-Gek-Gel and Maralgel. The Caspian Sea is the largest lake in the world. It was formed in the second half of the anthropogenic p

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