

Problems of Agriculture in Azerbaijan and the Prospects of its Development

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Abstract

This article examines the current state of soil and water resources, farmland in Azerbaijan Republic, the problem of progressive water and wind soil degradation, the need for the organization of agriculture, taking into account the introduction of automated control systems for irrigation using water saving technology and hardware equipment in it, the study of the characteristics and analysis of experience implementing measures to stabilize ecological and drainage system of agriculture in conditions of insufficient moisture areas in the country, as well as basic aspects of development of environmental reclamation approach balanced, rational use of a particular system of crop rotation and crop taking into account the requirements of economic development and environmental management.

Keywords: Soil; Erosion; Erosion and Moderately Eroded Soils; Fertility

Introduction

Natural - Economic Conditions of Azerbaijan

The area of the Republic of Azerbaijan is 86.6 thousand km². The population (as of January 1, 2009) is 8.7 million people. Azerbaijan is located on the western shore of the Caspian Sea. The length of the coast of the Caspian Sea in Azerbaijan is 713 km. Azerbaijan is the most important trade and transport hub of the Great Silk Road (Figure 1).

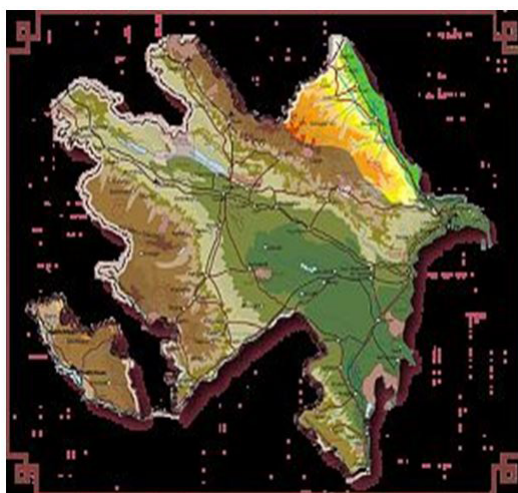


Figure 1: Natural - economic conditions of Azerbaijan

Azerbaijan occupies the northwestern and southeastern parts of the Caucasus Mountains. The borders of the republic are: from the north - the Republic of Dagestan, which is part of the Russian Federation, from the west - the Armenian and Georgian Republics, from the east - the Caspian Sea, from the south borders with Iran and Turkey. The territory of the republic is divided into 5 major natural economic zones: the Greater and Lesser Caucasus, the Lenkoran zone and the vast Kura-Araks economic zone located between them, the Nakhchivan natural economic zone, which consist of 10 natural economic zones: Absheron economic region, Guba Khachmaz economic region, Shaki-Zakatala economic region, Gornaya Shirvan, Ganja-Gazakh economic region, Kelbedzhar-Lachin economic region, Upper Qarabakh, Aran economic region, Lankaran-Astara economic region, Nakhichevan Autonomous Republic. Within the borders of Azerbaijan is the south-eastern part of the Greater Caucasus.

From the summit of the town of Tinov-Rosso - to the summit of Babadag, the Main Caucasus Range stretches, east of Babadag, the ridge goes down to the Caspian Sea. The highest peaks of the Caucasus Range in Azerbaijan are the city of Bazar-Duzy (4489 m), the city of Tfan (4197 m) covered with eternal snow. In the south-west, the Main Caucasus Ridge terminates towards the Ganikh-Agrichay valley, where rivers flow, carrying water from the ridge, to the south of the valley there are foothills. The Absheron Peninsula and the adjacent Gobustan foothills are located in the southeast of the Great Caucasus.

To the north of the Main Caucasian Ridge, the Side Ridge stretches its eastern part within Azerbaijan. The high peaks of the Shahdag mountain range (4251 m) are covered with glaciers. The Lateral Ridge gradually decreases in a southeastern direction and ends at the top of Beshbarmak.

From the northeast, the Hussar Inclined Plain adjoins the Lateral Ridge and merges with Samur - Devichinskaya Lowland.

The Lesser Caucasus region is located southwest of the Kura depression. Within Azerbaijan, the Shahdag, Murovdag, Garabakh, Zangezur and Daralagezsky ranges, as well as the Garabakh volcanic mountain, stand out here.

The southeastern part of the republic is occupied by the Talysh Mountains with longitudinal ridges: Burovarsky, Peshtasarsky, Talyshsky. In this zone, the relief is mid-mountainous, but in the mountainous part there are numerous ridges, and this causes the formation of intermountain depressions.

Lankaran lowland is a sloping plain. The formation of the relief was influenced by the regressions of the Caspian Sea and the flow of accumulative material from the mountains. Unlike the Greater and Lesser Caucasus, this area was not subjected to quaternary glaciation [1,2].

On the territory of the Nakhichevan Autonomous Republic, the Zangezur and Daralagezsky ranges are located. The border between the Nakhichevan Autonomous Republic and Armenia runs along the crest of the Zangezur Range.

The climatic conditions in Azerbaijan are complex and unique. More than half of the territory of Azerbaijan (58%) are mountains, the rest (42.8%) are plains and lowlands. The territory of Azerbaijan with high mountains, intermountain depressions, valleys, volcanic highlands was formed during the geological epoch. On a relatively small territory of the republic there is a full range of sediments.

The peculiarities of the geological structure and the available material on the tectonics of the entire territory of the republic make it possible to restore the history of the development of its topography from early geological eras.

In the Greater and Lesser Caucasus, the geological history of the development of the relief can be traced from the Upper Jurassic, in Talysh from the beginning of the Paleogene, in the Nakhichevan Autonomous Republic from the Paleozoic [3,4].

According to Antonova BA, at the beginning of the Oligocene, in the Early Miocene, Budagov [5], tectonic processes intensify and, as a result, the land surface increases. In the Greater Caucasus, Kusan and Tefan rises increase and clay accumulates in their troughs. In the Lesser Caucasus, along with clays, there is an accumulation of sand, gravelites and conglomerates, deposits characteristic of river valleys as they leave the mountains. This suggests that already at that time there existed a river network in the Lesser Caucasus.

A significant part of the Kura Basin was a sea basin, within which the islands were located. In the Oligocene sushi is formed in Talysh, while the central part descends, there is an accumulation of a powerful unit of the Maikop suite, the formation of the Yardymlynsky, Peshtasarsky, Burovarsky ridges. In the middle and late Miocene, the development of the relief of Azerbaijan is intensifying.

Central Vandam lift and section The Kaddag trough, which rolled them up, was already a mid-mountain ridge, fragments of which are preserved in modern relief. The relief also expressed Kusarskoe, Beshbarmak elevations.

Changes took place in the Middle Miocene and the Lesser Caucasus. This is evidenced by the presence of sandy material, pebbles, a layer of conglomerates [6].

In the Lesser Caucasus, in the Middle Miocene, the Murovdag, Garabakh, and Zangezur ridges apparently exceeded the heights of the middle mountains, and the Shahdag and Daralagezsky ridges did not reach the middle mountains.

According to Budagova BA, Khalilov GA at the beginning of the late Miocene in the Greater Caucasus the transgression of the sea expands.

In the Early Pliocene, the formation of mountain structures of the Greater and Lesser Caucasus, Talysh continues. In connection with the tectonic uplifts, the Tfan-Dibrar land is freed from the sea. The relief has already formed in the Greater Caucasus, extending to the town of Babadag. The sea basin occupied the south-eastern Shirvan.

In the formation of the relief of the Lesser Caucasus, the Nakhichevan Autonomous Republic, Talysh, the main changes occurred in the Early Pliocene. Tectonic processes during this period are expressed in the uplifting of the main mountain ranges and the activation of the volcanism of the Karabakh Highland. The formation of the South Caspian depression and the formation of the Lenkoran lowland are also associated with this period.

Late Pliocene - the beginning of a new era associated with the transgression of the sea, oceanic waters erupt into the Caspian depression and form vast bays.

During the Pleistocene, there is a dramatic change in climate, and this entails an intensification of tectonic processes, an increase in the height of mountain structures, an increase in sedimentation, terrigenous material and an alternation of transgresses and regressions of the sea.

A strip of proluvial-deluvial plain formed in the Lenkoran zone. In the lower reaches of the rivers Bolgarchaya, Vilaschaya and the others of other rivers, fan-out cones were formed.

The mountain structures of the Greater and Lesser Caucasus continued to form and acquired a modern look, the high mountains of the Greater Caucasus reached a height of 4,000 m by this period.

In the area of the Garabakh Highland volcanic activity was manifested. The lavas formed either stepped plateaus or flowed down the valleys of the Tartar, Bazarchay and Arpachay rivers. Mountain-valley glaciers developed in the high-mountain parts of the Greater and Lesser Caucasus.

On the territory of the Greater and Lesser Caucasus, folded Jurassic and Cretaceous shales there are sandstones, sandy limestones, limestones, collected in complex folds. In the southeastern Caucasus there are deposits of chalk, represented by clays and limestones.

On the territory of the Nakhichevan Autonomous Republic, Miocene deposits are expressed in salt-bearing strata.

According to Kashkai MA [7] Middle Devonian deposits are represented by coral limestone, sandstone, shale. Upper Devonian sediments are sandstones, shale, quartzites. The thickness of these deposits is 1100 m.

Permian sediments consist of marl limestone with a thickness of several tens of meters. Jurassic deposits are found on the territory of the Greater and Lesser Caucasus.

These are mudstones, sandstones, in the Middle Jurassic there are volcanogenic rocks, in the Upper Jurassic-carbonate rocks. The flat territories of Azerbaijan are composed of alluvial, alluvial-proluvial and marine quaternary sediments [8,9].

Agriculture in Azerbaijan

The geographical location of Azerbaijan causes strong solar radiation and heat, creates the opportunity for growing many crops.

According to the information as of January 1, 2009, out of 8.64 million hectares of land, 4.75 million hectares are suitable for agricultural purposes, and 1.8 million hectares are agricultural land [10].

The area of irrigated land in Azerbaijan is 1.4 million hectares.

Per capita in Azerbaijan falls 0.98 hectares of land and 0.21 hectares of agricultural land.

Domestic and foreign policy in short lines ensured the development of relations with foreign countries, and, starting from 1995, a real and permanent increase in the country's economic potential.

The "GDP" of Azerbaijan in 2008 reached 38.0 billion manat. The share of agriculture in the GDP structure is 5.8% [11].

Agriculture and Its Role in the Economy of the Country

Agriculture is a traditional industrial economic area in Azerbaijan. The territory of the country was originally the main for the development of agriculture and animal husbandry. The archaeological excavations show that as early as 6-8 thousand years BC, cereal crops were grown on the territory of modern Azerbaijan, and viticulture, sericulture and fruit growing developed.

Most of the country was mountainous, which is why livestock played a crucial role in the lives of people living in this area.

It was during this period that the country began to export high-quality wines, carpets, leather and silk products to Europe and the East.

The development of the oil industry in the early twentieth century in Azerbaijan has led to an increase in investment in the oil sector, including and in agriculture.

There was a rapid growth in the development of viticulture, high-quality wines were produced in the western part of Azerbaijan. In addition, oil magnates (Tagiyev XZ, Nobel brothers, Rothschilds, etc.) laid out large investments in the development of weaving, which contributed to the development of cotton growing, sericulture and wool production.

Therefore, the processing of agricultural products has played an important role in changing the structure of employment of the population.

After World War II, the agriculture of Azerbaijan entered a new milestone in its development, which reached its peak in the 1970s-1980s. At that time, 45% of GDP, 40% of workers and 33% of the country's fixed assets accounted for the agro-industrial complex.

Since 1995, as a result of agrarian reforms, the land and property belonging to collective farms and state farms were irrevocably distributed among the rural population, agricultural processing enterprises were privatized.

Currently, 869.3 thousand (3438.6 thousand people) family farms are operating in the country, 826 thousand people received their privatization share. 48% of the population lives in rural areas.

Agriculture occupies a very large share in the level of employment among the sectors of the economy.

Agriculture compared with other areas of the economy has a higher growth rate. For example, the "GDP" in agriculture in 2003 was 5.6%, in 2008 6.1%. Growth in agricultural production means an increase in the country's export potential.

Existing Position of Rural Economics and Its Development

The basis of agriculture in Azerbaijan consists of two large areas - crop and livestock.

Currently, in crop production, priorities are given to the development of such areas as grain growing, cotton growing, vegetable growing, potato growing, fruit growing, vine growing, tobacco growing, in animal husbandry they pay attention to the development of cattle breeding, poultry farming and horse breeding. 63.1% of agricultural products in 2008 accounted for crop production, 36.9% for livestock. In 2008, as compared with 1995, the share of crop production increased by 4.5%, while the share of animal husbandry decreased by 4.5%.

The total area of acreage, including under perennial plants, reached in 2008 1634.2 thousand hectares. Statistical observations over the past ten years show rapid growth in the share of cereals, leguminous plants and vegetables, potatoes and garden plants in crop production.

In accordance with 2008 Figures, the share of grain and grain-legume crops (59.6%), fodder plants (23.2%), vegetables (5.4%) and potatoes (4.6%) was the highest in the structure acreage. This trend comes from the aspirations of farms, first of all, to provide themselves with essential foodstuffs.

Along with the successes in the production of agricultural products compared with 1995, agriculture is undergoing structural changes. If in 2008 compared with 1995, the production of cotton, tea, tobacco and grapes is reduced, the production of sugar beet is observed to increase by 6.9 times, garden plants by 9.7 times, potatoes by 6.9 times.

Compared with 1995, in 2008 grain production increased 2.7 times, vegetable production 2.9 times, fruit 2.2 times. At this period, along with the growth of quality indicators in crop production is also increasing quality indicators.

Currently, the country pays special attention to the growth of production indicators in agriculture. So, for example, in 2008, 603.9 thousand hectares or 40.3 of the total sown area were allocated for the cultivation of grain crops.

Agrarian reform had a positive impact on the development of livestock. In 2008, compared with 1995, livestock increased by 1.5 times and reached 2549.5 thousand heads, incl. The total number of cows and bulls increased 1.6 times (1,230.8 thousand), sheep and goats - 1.8 times (8203.4 thousand), birds - 1.7 times (22352 thousand).

Along with the increase in livestock population, agricultural production and productivity of agricultural enterprises increased. In 2008 (as compared with 1995), meat production increased 2.1 times, milk 1.7 times, wool 1.6 times, eggs 2.2 times.

It should be noted that the attention paid by the Government of the Republic to agriculture has led to the dynamic development of the country's agro-industrial complex, the rapid changes in the socio-economic appearance of the Azerbaijani village.

Strategy and Priorities of Agriculture in Azerbaijan

The strategy of the agricultural sector, as indicated in the state program, is to ensure food security. The priority tasks of plant growing in agriculture are the development of grain growing, cotton growing, fruit growing and grape growing, vegetable growing, tobacco growing, seed growing and breeding seedlings.

In animal husbandry, priority areas are selection, feed, processing of agricultural products, agro marketing, agricultural services.

Important tasks of agriculture are the reduction of poverty and the opening of new jobs.

Along with the above tasks, it should also be noted tasks such as the provision of information and advisory services in the agricultural field, the strengthening of the material and technical base of research enterprises, the reorganization of their activities based on the requirements of a market economy.

One of the main directions of economic products in the country and improving the provision of food to the population at the expense of local producers.

As criteria for the implementation of the State Program by 2015, the following targets are set:

- 900 thousand hectares of acreage under grain crops, yield 32 t/ha, total yield 2.8 million tons;
- Production of meat up to 340 thousand tons, milk and dairy products up to 2.4 million tons;
- Industrial production of poultry meat -80 thousand tons, eggs 1.3 billion pieces;
- Potato production 1.12 million tons;
- Production of vegetables and garden plants, 1.72 million tons;
- Fruit production 800 thousand tons;
- Sown area of oil crops 135 thousand tons;
- Sown area of sugar beet 20 thousand tons;
- Tea leaf production 3 thousand tons;
- Sown area of forage crops 500 thousand ha;
- Annual production of high-quality balanced mixed feed 2 million tons.

State Support to Agriculture

Below are the measures taken by the state to develop the agricultural sector through the rational use of the country's raw materials, natural and labor resources:

- Exemption from the tax burden of agricultural producers in accordance with the Law of November 28, 2003 and November 25, 2008, signed by the President of the Republic of Azerbaijan;
- Allowance of 40 manats (\$ 50) issued to agricultural producers for each hectare of cultivated area and for the cultivation of perennial plants on the basis of resolutions of the Cabinet of Ministers of February 15, November 13, November 16, 2007, June 13 and September 22, 2008 within the framework of implementation of the Order of the President of the Republic of Azerbaijan dated January 23, 2007;
- Allowance of 50 manats (\$ 63) issued to agricultural producers for each hectare of cultivated land and provided by Agro leasing, and other legal entities and individuals 50% discount on fertilizers sold to agricultural producers;
- Payment of 50% of the sum insured for insurance of fees for wheat, barley, corn, sunflower, potatoes, sugar beet, vegetables, fruits, citrus fruits and grapes:
 - 50% discount on regionalized wheat seeds received at public expense;
 - 70% discount on fertilizers for processing each hectare of acreage;
 - 50% discount on sold pedigree cattle purchased by Agro leasing OJSC, etc.

Findings

- For the proper development of agriculture in Azerbaijan, it is necessary to identify priority areas for natural resources. One of the priorities in the republic is the preservation of soil and water resources.
- Livestock should increase the quality and quantity of feed. To obtain high-quality feed, it is necessary to introduce new technologies for their preparation. Restoration and preservation of the gene pool of cattle.
- Intensive use of soils in small farms for the cultivation of grain and fodder. Carrying out activities towards the integration of small farms in cooperatives.
- Organization of seed and leguminous crops in farms, the selection of plants resistant to extreme conditions. Development and application of growing technology for high yields while preserving the ecological balance and restoring soil fertility.
- Development of measures for salinization and prevention of soil degradation, disposal of waste and drainage waters, combating desertification. Development and implementation of water-saving safe equipment and irrigation technology.
- Measures to combat soil erosion in Azerbaijan should be comprehensive and consist of agro technical, forest reclamation, hydro technical measures.

In the agricultural regions of the republic where the soil is subject to erosion, in order to control and prevent the development of erosion processes on slopes up to 200, it is necessary to tillage and plant field crops only across the slope, as well as to apply baptism and embankment. When plowing long slopes, it is necessary to leave intact transverse buffer strips 3-5 m wide.

Plowing slopes 200 and higher should be strictly prohibited, making them laying or using them under gardens and vineyards.

In the area of ravine erosion, measures to combat the ravine formation should be carried out differentially, depending on the stage of development of the ravines.

Based activities should be aimed at retaining surface run-off water and reducing the concentration of flows in the catchment area through the use of agricultural technology, forest reclamation, and, if necessary, engineering structures. The use of various methods of combating ravine erosion will be of great importance in the part of the foothills of the southern slope of the Greater Caucasus, where the Mingechaur reservoir is located.

Soil protection from wind erosion should be carried out by creating forest belts and windbreaks, which is the most important factor in soil blowing, in combination with a set of special anti-leash agrotechnical techniques.

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