

Irrigated Agriculture Problems in Azerbaijan and its Development Prospects

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Abstract

This article provides a summary of the history and actual state of agricultural science and production (including land reclamation, soil erosion and salinization, and much more, study that is one of the main types of scientific activity of the Institute erosion and irrigation of the Azerbaijan National Academy of Sciences) in Azerbaijan.

Keywords: Agriculture; Environment; Erosion; Salinization; Water Balance Deficit

Introduction

Figure 1 Irrigated agriculture problems in Azerbaijan, it should be noted that due to the complexity of the physical-geographical conditions and 41.8 per cent of anthropogenic impact in one way or another affected by erosional processes. Currently land in Kur-lowland delimited by the heavily polluted [1]. The total number of saline lands in the Republic is about 1000 thousand hectares, although some of them are equipped with collector-drainage network. For their washing and recovery requires additional fresh water. Traditionally, water-intensive crops are grown in Azerbaijan. And water consumption per hectare of irrigated land behind the water shortage, leaving instead of 6-7 irrigation plants receive irrigation 2. As is known, Azerbaijan differs from all other regions in climatic conditions of 11 climatic zones existing in nature, 9 happens in our Republic [2]. This fact requires a special approach to solving the problems of agricultural production. The situation is further complicated by the fact that rainfall in the Republic is very uneven, and in some regions is not enough to meet the needs of crops during their growing season. the presence of water shortage. Water resources of Azerbaijan make up 32.3 billion cubic metres per year, and in dry years this figure is reduced to 23.16 billion cubic meters (95% off). Of these water volumes their own water resources are 10 billion m³. As a result, the Republic has only 14% of the total water resources of the Caucasus [3]. Prior to the 1990-year Azerbaijan was one of the largest agricultural producers and the main exporters of raw cotton, tobacco, grapes, wine and vodka, fruit and vegetable and canning products. However, after the transition to a market economy, there has been a change in the structure of cultivated areas. Currently, crops occupy 1 million. 50 thousand.

HA-the total harvest is 2.8 million. Tons, mainly wheat. The area for planting cotton in the Republic has been reduced, owing to market conditions. The Republic belongs to landless countries because per capita here no more than 0.2 hectares of arable land.

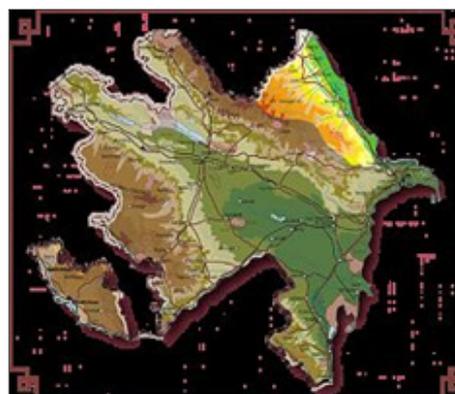


Figure 1

In Azerbaijan, in addition to soil erosion, there are problems associated with desertification. They are accompanied by the restructuring of the thermal balance of the region [4].

It is known that the deserts are arid territories, almost devoid of vegetation and soil with a low biological productivity. Priority directions of development of science and education of agricultural science thus studying desertification and measures to implement them could stop desertification facing the Republic.

The water needs to carry out scientific research on mountain slopes with irrigation technology with the introduction of macro- and microelements, rational use of soil and water in the Plains and foothills and sloping lands of Azerbaijan Republic. On this subject are the following:

- a) Development and implementation of water-saving, environmentally friendly equipment and irrigation technologies.
- b) Development and implementation of highly effective means of drainage on irrigation systems.
- c) Development of recycling of waste and drainage water.
- d) Development of salinization.
- e) Development action and research to prevent soil degradation.
- f) The development of measures to combat desertification.

It should also be noted that one of the most important areas for agricultural development in Azerbaijan is the production of agricultural crops. It is particularly important to ensure the population food in Azerbaijan are grains and legumes. So, the above crops are grown annually in different soil and climatic conditions of the Republic, in connection with which there is a need to develop an effective strategy for a agro-ecological region. The successful solution of these tasks depends on the creation of a widely adapted, disease-resistant, high-yielding and stable genotypes of cereals and legumes that depends primarily on the enrichment of the world's gene pool. The problem of salinization in Azerbaijan in recent years at 593 thousand squares. HA of irrigated land (41%) were complex reclamation measures [5]. Because of large-scale drainage zone has expanded and now stands at 593 thousand hectares, that there are thousands of hectares 310.4 open horizontal drainage network. In 264, 4 thousand hectares of closed drainage and 13.2 thousand hectares-vertical drainage. The length of the collector-drainage network is characterized by the following data: closed drainage-10 thousand km, open drainage-9.7 thousand km, different orders-11.6 thousand km.

At the same time, 43.8 per cent of irrigated land, i.e. 633.8 thousand HA, to varying degrees, saline, including 429.8 thousand HA (68%) salted Earth, 139.8 thousand HA (22%)-medium saline, 66.2 thousand ha (0, 4%)- low salted Soil salinity adversely affect crop yields, growing on these lands. Crop yields on average reduced by 23.0%-with low salinity, 47.0% with average salinity and 85.0% with strong salinity. So, for desalting of these lands, as a rule, rinsing the capital is carried out on the highly salted sites and salt marshes and irrigation measures agricultural and agro-ameliorative methods are carried out on lands with low and high salinity. Among these methods, an important role is played by the irrigation mode, including the application of the charge of irrigation (winter and spring araty) and today's flushing during periods of no vegetation. The Republic of Azerbaijan is characterized by the variety of soil and climatic conditions, and there are nine out of eleven climatic zones that are available on the globe. In accordance with the nature

of reclamation measures clearly distinguishes three categories of improved lands.

The soil is alluvial origin with chloride-sodium salt composition (Naal prevails in salinity) and high filtration capacity. Priority directions of development of science and education, agricultural science, who quickly freed leaching salts, agro physical soil properties during washing do not become worse:

- a) Soil chloride salinity with chlorine content is 40-60% dense residue toxicity threshold 0.2%. This soil is widespread in Salyan Plains and Northern Mugane.
- b) Soil salinity sulfate-chloride type with chlorine content 25-35% dense remnant toxicity threshold 0.3%. This soil is widespread in Northern Mughan, in the South-East in a narrow Shirvani Near the Araksin Shirvani, in the Near the Araksin Valley at the mill plain and in a narrow coastal strip along the Caspian Sea.

The soil is alluvial plains and foothills-proluvialnogo origin with sulfate-magnesium-sodium composition, salinity and saline salinity, which in its original state has adverse effects property *agrofizicheskie solonetsous* during rinsing:

- a) Soil composition is chloride-sulfate salts containing chlorine-10-20% dense remnant, with the toxicity threshold 0.4%. This soil is widespread in Shirvan plain, Southern Mugan, widespread in the Karabakh plain and partly in the mill plain. Soil salinity, sulfate containing chlorine-0.10% tight balance, with a threshold toxicity 0.4%. The spread of this soil formed on Shirvan plain, Southern Mugane, Karabakh plain and partly in the mill plain. Soil salinity sulfate-chloride type with a high content of gypsum (NaO_4 2-3%) containing chlorine-0-10% dense, with a threshold of 1.0% toxicity. This soil is widespread in Shirvan plain and South FK Muğan Salyan.

The soil is delioivial-pro-neural or alluvial origin with salty salinity series soda is alkaline Wednesday:

- i. Soil with soda-sulphate salinity, which is a natural substance solonetz, prone to additional salty during rinsing, it contains soda in small amounts, Wednesday reaction is alkaline. Distribution of the soil occurred in individual farms-Mil and Karabakh Plains.
- ii. Soil salinity with sulphate of soda, strongly salty, merged, the reaction of the soil solution composition of several salts alkaline soda: Na_2CO_3 , NaCl_3O_3 , MeNO_3 . soil heavily dispersing, swells when moisture, water and salt is extremely low. This soil is widespread on the cone remove the river Tartar, in Karabakh the steppe. In the Organization and conduct of washing, washing, these groups of soil should guide standard depth assignment provisional flushing time leaching soils, and flushing should be done differently for these groups.

Because of numerous studies conducted on experimental plots of land reclamation Institute, have developed specific recommendations for improving saline land with the use for these categories.

On lands with high filtration capacity and salinity type is chloride-sodium it is recommended that you use the "band-wise and periodically rinse." The essence of washing gas clock is dividing the spacing on its width, 3-5 parts. The strips are separated, earthen ramps with height of 0.6m-1.0m. soil Washing takes place gradually [6]. In the first phase the Central stripe is washed, the second central Strip and adjacent-Midland and the third are included tattered strips. Intermittent wash the essence of several wash pouring checks with an interval between fillings for the time needed to decreasing groundwater in central part of intergrading at a depth of -1.5 1.0m from the surface and to prevent the closure of the rinse water and groundwater. Priority directions of development of science and education of Agricultural Science with those technologies of soil desalination homogeneously across the width of the interdependence (thanks to the uniform distribution of industrial standards) and wash water overhead are excluded. Heavy, poorly permeable Earth recommended capital leaching differently depending on lithological structure, degree of salinity and filtration properties of soils:

Priority directions for the development of science and education in Agricultural sciences with the

- a) The lands with a filtration coefficient -0.30 0.10m/day and to the required standards of washing-up to 10 000m³/ha, washing in the usual way is carried out capital, amid constant deep drainage.
- b) The lands with a filtration coefficient -0.30 0.10m/day and with the frequency required Washing 10-30 thousand m³/ha, permanent deep drainage is improved by additional temporary drains for the period capital clearing.
- c) On the lands with reduction of permeability coefficient of filtration with -0.10 0.05m/day and when the thickness of the compacted upper layer does not exceed 0.6 -0.7 meters and the necessary Washing rate is less than 10 thousand m³/ha, the capital washing is carried out against the backdrop of the permanent output deep drainage with deep soil treatment before it is implemented [7].
- d) On the lands with one and the same factor filter and Packed the same thickness of the top layer, as in the previous case, but you should wash course 10-30 thousand m³/ha, the capital of the rinsing is carried out against the backdrop of deep and permanent temporary shallow drainage combined with the use of deep soil treatment before washing.
- e) On the lands with a filtration coefficient -0.10 0.05m/day and the presence of compacted upper layer of a thickness not exceeding 0.6m -0.7m, regardless of the degree of initial soil salinity, thorough rinsing is carried out against the background of Standing deep and temporary drainage, combined with deep soil treatment before washing.
- f) On the lands with a particularly cohesive and bare soil, with a filtration coefficient 0.05m/day capacity upper horizons condensed more than 0.06 -0.7m, capital, washing is carried out against a backdrop of deep permanent and potty temporary

drainage, combined with deep soil processing before flushing and using chemical pesticides or chemical means.

In the soils of the soda-saline primary criterion for reclamation is the degree of salinity and salt content of soda (regular and bicarbonate). The land is subject to chemical washing and reclamation on background of drainage [8]. Chemical reclamation, acidic and physiological salt, acid or neutral salts two and trivalent metals proved effective. Practically raw hammer plaster (NaChCl₄x2P₂ch) is a widely used preparation.

The above-mentioned land reclamation methods (wash cycle, wash amid temporary drains are shallow and deep soil, gypsum), except electro electroreclamation and chemical chalking, were widely used in the practice of land reclamation, which irrigated lands increased with each passing year. These methods were industrial and successfully implemented under the former Soviet Union. Privately owned their use difficult and approaches for desalination of saline and saline lands, tend to be different. In connection with land reform, 3.8 million hectares of the total stock of the Republic of the 8,641.5 thousands of acres remain in State ownership, 2.74 million hectares are allocated to municipalities and 2.1 million hectares is distributed among the users of private land i.e. farmers, cooperatives, associations, etc. on State and municipal lands, the implementation of measures for the reclamation of land distribution now due to material and technical security. Priority directions of development of science and education. Agricultural Sciences is suspended, and after their resumption above, washing technology will continue to be carried out.

Lands and Azerbaijan, selected users of private land, there are usually some salt and medium saline and medium saline soils and certain stains strongly and very strongly saline lands. On these lands, mostly it is necessary for the performance of washing irrigation regime, irrigation water charge and current washes for which developed selected recommendations and instructions. Most suitable for these lands are the rice harvest. In addition, there has been developed technology for horizontal washing with deep furrows that can be implemented by kaper on his farm. In terms of the concentration of major stocks of salts in the upper horizons (0.4-0.60cm) as well as fresh and lightly mineralized groundwater, it is desirable to apply horizontal Washing against the backdrop of deep furrows.

Flushing should be done in the following sequence:

- a) flooded with flushing water through furrows, which deliver, while others, as bypass surgery, serve as drainage Steering.
- b) interbreed interbird space is flooded.
- c) flood tribal space continues, flooding inundated furrows, supply channels to play the role of drainage.
- d) Washing keeps flooding the entire area, including channels deep furrows. The advantage of horizontal rinsing that rarely to accelerate the process of rinsing, salt the deletion occurs, bypassing the main horizons.

Erosion in Azerbaijan

Study of soil erosion in Azerbaijan is important, since the Republic is predominantly mountainous country, and developing all types of erosion processes on its territory [9]. Development of erosion processes on the territory of Azerbaijan manifests itself in the form of flushing, erosion, formation of gullies and landslides, salt flows and the formation of pools and other forms of blows. There is also the role of inappropriate human activities in the use of mountain meadows, steppes and semi-deserts, unsettled runoff precipitation and soil treatment without considering the flow and direction of the wind. In different physiographic regions of Azerbaijan, depending on the intensity of development of erosive processes, the use of the territory flows differently accelerated erosion in strong form manifests itself in mountainous and partly the foothill zone of wind erosion in the foothills and low-lying areas [10]. The main factors causing soil erosion development in Azerbaijan are: grazing in the mountain zone, its concentration without regard to the productivity of pastures (cattle), unsettled watering etc.; in the forest zone of the mountain already, unsustainable logging, grazing in the forest, improper conduct of farming system including plowing land on steep slopes for growing crops, etc.

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