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About the Role of Low-Intensity Irrigation Systems in Solving the Problems of Agriculture in Azerbaijan

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Abstract

The article deals with the problems of assessing the state of the water and land resources of Azerbaijan. The authors note that currently in the country from the total turnover of land large areas are excluded that are unsuitable for agricultural production because of the construction of individual buildings and structures, the rise of groundwater level, the development of various types of erosion and for both reasons. At the same time, there is an acute shortage of water in the country. Consequently, through the introduction of scientifically significant advanced irrigation technologies and methods of agricultural techniques (minimum depth) of soil treatment, it will allow the development of additional areas of sloping terrain, which will enable it to cope with this problem and achieve its goals.

Keywords: Water resources; Erosion; Arable land; Agricultural production; Global warming; Irrigated lands; Irrigation.

INTRODUCTION

The total area of the Republic of Azerbaijan is 8 641 500 hectares of land, of which 55 percent (4 756 500 hectares) are suitable for agriculture, and 16.6 percent of the total area or 1 432 600 hectares is irrigated land. 1 808 400 hectares of the total balance of land is arable, that is, suitable for agricultural production. It should be noted that 181 600 hectares of the total arable land have a controversial issue of belonging to Armenia [1].

Currently, more than 42.8% of the entire territory of the Republic (70 ... 85% in some regions) is subject to various erosion processes. There is an acute issue of the availability of water resources suitable for agriculture. It should be admitted that for one person in 1959 there was 0.36 hectares of arable land, in 1970 - 0.23 hectares, in 1979 - 0.21 hectares, in 2006 - it decreased to 0.155 hectares. According to the authors of the article, the country's water resources amount to 32.5 billion m3, and in dry years this figure decreases by 23.16 billion m3 [2].

The results of the study revealed that up to 96% of irrigated land is irrigated mainly by traditional methods of irrigation (along furrows and overflow, by surface method), and by other methods using progressive water-saving low-intensity technology of irrigation systems, only up to 5% of the total number of irrigated lands of the total area of arable land, 224 700 hectares are occupied by perennial crops, 117 600 hectares - hayfields, 256.0 thousand hectares - pastures, 45.7 thousand hectares - fallow lands, personal subsidiary plots - 258 100 hectares (227 600 hectares of arable) , 1,038,800 hectares are included in the share of regional forest plantations. In connection with the increase in the population (currently there are about 10 million people), land is allocated for the construction of individual buildings and structures, etc. As a result, the groundwater level rises, various types of erosion develop [3]. And as a result of improper management of agro-reclamation measures on production areas in individual farms and violation of the rules of environmentally friendly crop cultivation technology (including agricultural machinery), the area of arable land per capita is annually decreasing one person in 1959 accounted for 0.36 hectares of arable land, in 1970 - 0.23 hectares, in 1979 - 0.21 hectares, in 2006 - decreased to 0.155 hectares [7]. 60% of the entire territory is located in the mountainous part of the republic [4].

Due to the impact of natural and anthropogenic factors, it is possible to meet here in all types of erosion [5].According to the results of the numerous studies carried out by the authors of the article in the field of studying the patterns of development of the problems of land and landscape degradation in certain regions, it was found that the erosion process is very widespread (especially in mountainous areas) in the Republic of Azerbaijan [5].

As indicated above, more than 42.8% of the country's territory is subject to various erosion processes [5, 6]. One of the biggest factors is water and irrigation erosion. Research progress. In the republic, the use of the method of irrigation along furrows and overflow predominates, the agrotechnical measures of which (regardless of any protection of land,

agriculture, horticulture and animal husbandry) cause soil erosion .According to the author's estimates, the country's water resources are 32.5 billion m3, and in dry years this figure decreases by 23.16 billion m3.

According to research data, by 2020 the total annual values of water resources per capita in Azerbaijan will be 2 times less than in Armenia, and 7 times less than in Georgia. The volume of water resources in the country is only 30%, and the remaining 70% of the total volume of water sources have the main flow through neighboring countries [4,5,]. It should be noted that in conditions of constant water shortages and despite the sharply uneven distribution of water in the country, thanks to traditional forms of irrigation, there is a noticeable ecological and economic effect of reclamation measures. It is proposed to bring the efficiency of agricultural turnover in the production of a unit of crop production from the use of water resources by 2025 to a level of 1 kg / m3 and to a level of 1.5 kg / m3 by 2050 [2,3].

Discussion of Research Results

The results of the study revealed that up to 96% of irrigated land is irrigated mainly by traditional methods of irrigation (along furrows and overflow, by surface method), and by other methods using progressive water-saving low-intensity technology of irrigation systems, only up to 5% of the total number of irrigated lands. Therefore, the groundwater level is increasing every day. But in a number of areas, groundwater has been salinized and currently there are about 100 thousand hectares of suitable arable land. This causes the danger of upsetting the ecological balance of the country.

Currently, more than 53 thousand hectares of sown areas of the Kura-Araks lowland are classified as highly saline soils due to an increase in the level of ground mineralized waters, according to Therefore, these lands left the crop rotation (household plots of the population of these regions of Azerbaijan). Thorough flushing of these soils from hazardous salts of various kinds is required. [2,4].

The results of monitoring studies have revealed comparative indicators for water supply in 3 states: Georgia, Armenia and Azerbaijan, which, respectively, amount to 70, 25 and 10 billion km3. The total annual (per capita) water resources in these countries were 11000, 3000, and 1500 m3/person, respectively. According to research data, by 2020 the total annual values of water resources per capita in Azerbaijan are 2 times less than in Armenia, and 7 times less than in Georgia.

The author of the article draws attention to the fact that water resources are very important for the development of the economies of the countries of the region, especially for the industrial-production sphere and agriculture, which are the key types of employment of the population [3,4].

Conclusion In recent decades, the world's population has risen sharply each year, compared with the global population of 2.5 billion in 1950. Food demand is growing faster than population growth. Population growth and limited land and water resources require serious measures to ensure food security of all states. Agricultural production must produce a large volume of crop production, which requires large volumes of irrigation water. The goal of the implementation of the state program of the Republic of Azerbaijan in 2015 was the production of 11.2 tons per capita of agricultural products. At the same time, the Concept of global climate change shows and convincingly proves that at present it is impossible to rapidly increase the required water resources for the needs of agriculture. However, the value of agricultural products and water consumption is increasing.

Scientific and practical methods and advanced irrigation technologies and scientifically grounded agricultural techniques and rules should help to cope with this problem and achieve the set goals.All over the world, countries are struggling with a shortage of irrigation water. The Republic of Azerbaijan also seeks to balance this indicator for the needs of water consumption in agriculture. It is planned to bring the efficiency of agricultural turnover in the production of a unit of crop production from the use of water resources to the level of 1 kg / m3 by 2025 and to the level of 1.5 kg / m3 by 2050.

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