Climate change and water availability in agriculture

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Abstract. The rational use of water resources is considered as one of the main problems facing the humanity in the 21st century. The peculiarity of this situation lies in the fact that the water resources of the country that account for the smallest share of their use are used most efficiently. Most inherent issues in this direction are applied to agriculture. The task is to develop modern economically verified technologies that would ensure uninterrupted water supply of agriculture in various regions, which is one of the tools to ensure global food security, especially in the context of climate anomalies.

1. Introduction
Changes in the temperature and precipitation are becoming the most important factor determining the direction of development of the global agri-food complex.

In the 21st century, a massive reduction in the availability of water resources for agricultural production is expected to be exacerbated by an increase in the frequency of occurrence of climate anomalies.

2. Methodology
During the study, a generalization was carried out of the main approaches of researchers whose scientific interests lie in the sphere of analysis of the global problems of modern international integration processes.

To formalize and summarize the results of the study, general scientific methods of cognition were used.

3. Results
Traditional farming practices in the context of global climate change largely lose their effectiveness due to increasing water scarcity. In this regard, continuous monitoring of the availability of water resources is necessary to determine strategies for their use, both at the global and regional levels.

The demand for water in agriculture is determined by the scale of production, the availability of water resources, and other factors.

Global warming determines possible changes in annual atmospheric precipitation.

The demand for water and water supply for the sector of the economic complex and, above all, for the agro-industrial complex will be determined by the following additional factors, such as the
population growth, increasing urbanization of the planet, changing dietary preferences in many regions of the world and, above all, new industrial states in South-East Asia.

According to experts' forecasts, the demand for water will increase by more than 1.5 times by 2050, reaching a staggering 5,500 km³. In this case, all estimates are reduced to the fact that more than half of the volume of consumption will fall on household needs and electricity generation.

Climate change also determines the transformation of plant needs for water, which will require consideration when planning irrigation expenditures, especially in regions with growing water scarcity.

A certain trend has developed in the change in water demand. For example, by 2020, growth in water demand for crops in the northern regions of China is projected, while at the same time reducing the demand in the southern part of the country. At the same time, the shortage of water resources in Western Europe is possible with their sufficient volume in the eastern part of the region, whereas just recently the situation was just the opposite. And traditionally water-deficient regions of the south of Europe will face an even more difficult situation with water supply in rural areas. Prolonged water stress is possible in the countries of the Iberian Peninsula, which creates significant tensions in fruit and vegetable production and determines the export orientation of agriculture.

On the contrary, in a water-rich Ireland in the future, problems are possible with irrigation of pastures due to a sharp decrease in the amount of precipitation.

Decreased land productivity is one of the main negative trends associated with climate anomalies. Expert evaluation indicates a decrease in grain yield by 12-15% by 2050. At the same time, irrigation will act as a tool for leveling this situation, which would be very difficult due to, on the one hand, the unprecedented high costs of creating irrigation systems, and on the other hand, the growing shortage of water resources.

4. Conclusion

Thus, global climate anomalies greatly complicate the global water supply system in agriculture, increasing the water deficit in many regions of the world. This situation largely determines the need for adjustments in the location of agriculture, to some extent giving rise to problems related to migration.

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