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THE IMPACT OF WATER ECOLOGY ON AGRICULTURAL PRODUCTS

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ABSTRACT

This article is devoted to the issues of the impact of water ecology on agricultural products and increasing productivity, as well as increasing the productivity of irrigation waters.

It is necessary to solve the problems of water ecology, which depend on the effectiveness of the cultivation of agricultural products, the composition and quality of the water used in the irrigation of crops. The transition to effective water saving methods promotes water ecology, which ensures water, food and environmental safety in the region, determines crop yields and helps to increase product efficiency. In agriculture, the yield of cotton was analyzed. Analyzes are determined not only by the yield, but also by the possibilities of increasing plant production.

KEYWORDS

Water ecology, agriculture, method, analysis, productivity, water use, water resources.

Introduction

In the conditions of Uzbekistan, the largest amount of water to date is spent on agriculture. Of course, a lot of water is required to get a good harvest of agricultural products.

The regions of Uzbekistan are located in farming zones, where the lack of water is dangerous. A hazardous farming zone is an area with adverse climatic conditions for farming. The hazardous farming zone includes areas where crop yields are associated with the risk of climate anomalies: drought, lack of water for growing crops, the risk of pests attacking agricultural products. The climatic conditions of Uzbekistan are very severe in some regions, so a large part of the land is located in this zone. Summer heat to the growing season, the nutrient supply of agricultural soils - all this does not guarantee a good harvest. For example, in the Republic of Karakalpakstan, Khorezm region, Bukhara region, Jizzakh region, Kashkadarya region and other regions there are water shortages, problems of water ecology of the use of Water Resources in agriculture.

The availability of water resources for agriculture is a limiting factor. Increasing water scarcity limits food production opportunities, especially in areas with increasing negative effects of low water and drought, and problems with rational use of Water Resources and water pollution are becoming increasingly acute. Clean water is the basis of the existence of Agriculture around the world. However,

its reserves are rapidly decreasing day by day. All surface reservoirs suffer from various garbage disposal, with waste from different enterprises joining them. To provide agricultural land with sufficient treated water, it is necessary to use various treatment systems and try to use the water as rationally as possible.

There are ways to save water for agriculture. The use of precise irrigation allows you to quickly and accurately measure the flow of water, pressure consumption, control the start and end time of irrigation, determine the amount of water used for irrigation. Mulching helps to reduce moisture evaporation from the soil, in other words, if the soils remain moist for longer, the watering time and frequency can be significantly reduced. Mulching is the process of covering the surface of the soil under plants with organic or synthetic materials to protect them from weeds, drying out and sudden temperature changes. Mulching increases productivity and facilitates the work of gardeners and gardeners. It is carried out not only in the garden, but also in the greenhouse, and is also used for balcony plants and indoor flowers.

Crop-free farming facilitates moisture penetration into the upper soil layer and does not lead to erosion. In addition, contour farming, in which the soil is processed into sloping ground with rows of the same height, prevents water flow and soil erosion. Using these methods, it is possible to reduce the use of water in agriculture.

Material

Improving water supply in rights, water can ensure the market value of the resource and, as a result, lead to the most optimal use of it. The provision of farms with water resources, often groundwater, usually includes permits or other control mechanisms, but due to too high costs to comply with the established requirements, a decrease in quality indicators and the illegal use of groundwater, this still remains a problem.

The degree of manifestation of the environmental consequences of irrigation is determined by the initial state of soils, the quality of irrigation water, the irrigation regime and the level of Agrotechnology. Therefore, all measures to prevent the negative consequences of irrigation should be built taking these factors into account. The introduction of an ecological regime of irrigation will help reduce the norm of irrigation, maintain the factors that make up the environment and ultimately maintain and further develop the ecological-economic potential of the area. To minimize the negative environmental consequences of irrigation, it is necessary to use modern technologies and methods aimed at the effective use of Water Resources. It is also important to use alternative energy sources to manage irrigation systems.

In the scientific research of a number of scientists, water ecology covered agricultural problems.

To assess the potential of the population, industry and agriculture to meet the water needs, the amount of water supply of the population is usually used, which is an indispensable feature that is determined by the amount of water resources that correspond to the population living in the area under consideration [1].

Water is one of the main environmental factors and is an important factor for the survival of plants and animals on Earth. In the process of obtaining a substance with the environment and photosynthesis, water participates as a metabolite and solvent. Mineral salts pass into the plant dissolved in water from the soil [2].

The purpose of hydrobiological monitoring is to obtain statistically reliable data that allows you to assess the state of water communities and the consequences of anthropogenic impacts on hydroecoticism in different parts of the reservoir [3].

Using the successes of modern ecology for the development of agriculture is undoubtedly the future path of science and production. Of particular importance is the development of the theoretical foundations of agricultural ecology using achievements in certain areas of agricultural production and construction [4].

Environmental regulation is the development and testing of scientifically based criteria and norms of maximum permissible harmful effects on the natural environment and humans, as well as norms and rules of environmental management based on common methodological approaches, comprehensive study and analysis of the ecological capabilities of ecosystems and their individual components [5].

Water ecology affects agriculture as follows:

* Water quality affects the quality and harmlessness of agricultural products, the viability and productivity of animals, the efficiency of the activities of enterprises. In irrigated agriculture, water quality affects soil fertility, water consumption, productivity, and the quality of agricultural products.
* Wastewater from agricultural lands and farms enters rivers and inland bodies of water, and then into oral marine ecosystems. Agricultural waste is the main source of pesticides and biogens, which are dumped in large quantities into water bodies.
* Unsatisfactory water quality during irrigation can affect irrigated crops and soils due to the accumulation of salts in the root system, a decrease in soil permeability, the transfer of pollutants.

Also, increased water scarcity limits food production opportunities, especially in areas with increasing negative effects of low water and droughts.

Method

The country needs to develop an expert assessment system based on the method of environmental change. Method of changing ecology assessment of the state of ecological systems:

- possible reorganization of biocenosis, which does not lead to complicating or simplifying the structure of biocenosis, that is, does not change the overall level of Organization of the communities included in it (biocenosis is a historically formed collection of populations of plants, animals and microorganisms that coexist in homogeneous conditions in a common area and interact with different types of relationships);
- the state of anthropogenic ecological stress (this is a state of biocenosis, which is represented by an increase in its diversity, in particular an increase in the total number of species, a complication of interspecific relations, an increase in spatial and temporal heterogeneity, a temporary structure and a complication of the food chain);
- the state of anthropogenic ecological regression (there is a decrease in diversity and spatial-temporal heterogeneity, an increase in entropy, simplification of interspecific interactions and trophic chains);
- the state of anthropogenic metabolic regression (biocenosis activity decreases in terms of the sum of all processes of formation and destruction of phytoplankton, periphyton, bacteria and organic matter of consumers).

One of the ways to use ecological change is based on the determination of changes in the overall metabolic intensity of biocenosis, which are assessed through the production properties of

phytoplankton (**phytoplankton** is a class of organisms found in large bodies of water and containing a variety of subspecies) and (**metabolism** or substance exchange is a set of life-supporting chemical reactions in a living organism. These processes allow organisms to grow and reproduce, maintain structures and respond to environmental influences). As a characteristic of metabolic intensity, the ratio of production and destruction of phytoplankton, as well as the nature of the vertical distribution of chlorophyll, was determined by its local fluorescence, including methods of remote analysis.
The method of financing an investment project acts as a way to attract investment resources to ensure the financial implementation of the project [6].

Analysis

The main branch of Agriculture, is herbalism. The amount of in-kind products grown in the field of agriculture of this network is called gross yield.
Economic analysis begins with determining the change in gross yield. By comparing the amount of gross yield produced in the reporting year to the amount of gross yield in the base year, the change is determined by the increase or decrease. Then the reasons for this change are determined and the possibilities of increasing the production of crop production are determined.
The change in the amount of gross yield occurs directly at the expense of two factors:
* The first factor, due to the change in the size of the crop area;
* Two factors are due to the change in the level of crop yield.
The sum of the multiples of these two factors gives the gross yield. This can be expressed as:
$\sum M_oH_o$ – the amount of gross yield in the basis period;
$\sum M_iH_i$ – the amount of gross yield in the reporting year.
Here: M_i,M_o – respectively indicates the planting acreage in the reporting year and in the basis period;
H_i,H_o – respectively indicate the level of productivity in the reporting year and in the basis period.
The effect of these factors on changes in gross yield can be determined using “indicator difference” method. We dwell here below on the procedure for determining and analyzing the influence of factors through the “difference in indicators” method.
From the gross yield in the reporting year to the gross yield in the base year (or plan), its total change is determined by:

$$M_iH_i - M_oH_o = \pm \Delta_{MN}$$

To determine the effect of the change in the amount of arable land on the change in gross crop yield, it is necessary to multiply the difference between arable land in the reporting year (or actual) and arable land in the base year (or plan) by the level of yield in the base year $(M_i - M_o)$:

$$(M_i - M_o) * H_o = \pm \Delta_M$$

To determine the effect of the change in yield rate on the change in gross yield, it is necessary to multiply the difference between the yield in the reporting year (or actual) and the yield in the base year (or plan) by the (actual) crop area in the reporting year (Hi – Ho);

$$(H_i - H_o) * M_i = \pm \Delta_N$$

The sum of the effects of these two factors must equal the total change in gross yield:

$$\Delta_M \pm \Delta_N = \pm \Delta_{MN}$$

Now, an analysis of the change in the amount of crops grown in cultivation can be considered using the example of the gross crop of cotton grown on the farm farms, relying on the rules of the above method.

Changes in gross yield are influenced by changes in crop area structure (structural structure) as well as changes in crop area and productivity.

Experimentally obtained data on agro ecological testing of cotton varieties prove the possibility of growing crops on the territory of the Republic of Kalmykia [7]**.**

Based on the above rules of the method, it is considered necessary to apply an analysis of the change in the amount of crop production on the example of the gross crop of cotton grown on a farm.

It can be seen from this that we are using the method of analyzing the gross yield of cotton, using this method it is possible to analyze the performance of the gross yield for all types of crops.

Result

To achieve more efficient and sustainable use of water, it is necessary to develop and implement water regulation measures to life, improve volume management mechanisms, introduce profitability and taxation, especially in areas with limited water resources, all effort and attention should be paid.

Naijador consists of the production of reliable, environmentally friendly food in agriculture:

- recognition of the complexity and diversity of Water Resource Management in agriculture;
- strengthening the institution of state and ownership for the management of Water Resources in agriculture;
- to guarantee that the benefits from the supply of water to agriculture will at least compensate for their cost;
- improvement of strategic integration between agriculture, water, energy and ecology policy;
- increase the resistance of Agriculture to changing weather conditions and climate change;
- eliminate gaps in knowledge and constantly improve the management of Water Resources.

Along with the growth of the world's population, there is a growing need for food, agricultural products and Water Resources.

As a result, when creating scientific innovative environmental projects for the development of Agriculture, obtaining scientific products, we will consider four interconnected and interconnected natural elements of Agriculture: the surface layer of the atmosphere, economic indicators that include the volume and cost of produced plants, soil, water resources and agricultural products.

The assessment of the change in the state of all listed elements of agriculture by options was carried out using integral indicators, including:

* for the surface layer of the atmosphere-a hydrothermal regime that characterizes the heat and moisture supply of plants, which depends not only on natural-climatic conditions, but also on economic conditions.
* for plants-general biomass and biodiversity, which depend on the hydrothermal regime of the agricultural system and applied melioration.
* for Water Resources-the regime and quality of surface waters, which are determined by the intensity of surface flows and the flow of polluted substances from agricultural land.
* for soils-their ecological and economic functions.

The productivity of irrigation water is the ratio of gross product to the volume of water consumed. This indicator is introduced in order to save water. Also, the productivity of irrigation water can be determined

as the ratio of yield (ton/ga) to volume of irrigation water (m3/ga). Suppose that if the yield of agricultural crops is 6 tons per hectare and irrigation water is 10,000 m3/ha, then the water productivity of crops is 0.0006 tons per m3.

To increase water productivity, it is possible to increase yields, increase the coefficient of useful movement of irrigation and ensure the operation of irrigation systems.

Conclusion and Suggestion

In conclusion, it can be said that the irrigation of agricultural land may has both positive and negative environmental aspects. Efficient use of Water Resources, prevention of soil erosion and maintenance of ecosystems are important to minimize the negative effects of irrigation. The introduction of modern irrigation technologies and methods of Agriculture in the cultivation of products makes it environmentally sustainable and effective.

Our suggestion is that the following measures can be taken to solve the problems of water ecology at the state, sphere and networks level:

At the state level, improving legislation in the field of water protection, strengthening environmental control over the activities of enterprises, establishing protective lines along the banks of water bodies and creating water protection zones.

At the level of spheres, improving technological processes in order to reduce water consumption and create circulating water systems. In addition, it is necessary to develop and use low-waste technologies. In order to provide the population with quality drinking water, it is also important to develop a state management system and improve the regulatory framework.

At the networks level, the rational use of water, including the application of fertilizers and pesticides, should be carried out only in case of technological necessity. For wastewater treatment, it is necessary to ensure and control the biological treatment and deep purification of the wastewater of agricultural enterprises, as well as the household wastewater of settlements.

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