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APPLICATION ECONOMICALLY ON THE MOST PROFITABLE MODERN IRRIGATION METHODS ON THE FIELDS OF FARMS IN UZBEKISTAN

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Abstract: *The article identifies a solution to the problems of improving the environmental and economic efficiency of the reclamation and irrigation complex in the arid zone, which includes the Republic of Tajikistan, requires the development and implementation of a set of measures related to the introduction of advanced land and water saving technologies, carrying out land reclamation measures, and stimulating investment activity in land-reclamation and irrigation sector, strengthening state support for infrastructure support of agricultural development, etc. Stable functioning of the ameliorative-irrigation complex is impossible without conducting a wider range of ameliorative measures, applying promising land- and water-saving technologies and farming systems based on the principles of environmental friendliness, efficiency and sustainability. The solution of this task is closely connected with the implementation of amelioration types, including a complex of agro technical, agrochemical, hydro technical, biological, ecological and other measures aimed at improving soil fertility, restoring disturbed water balance by reducing the amount of loss - surface runoff, optimizing reclamation regimes, reducing the intensity of water erosion and pollution of water bodies, as well as improving the biological diversity of agricultural landscapes.*

Key Words: *ecological and economic efficiency, land reclamation and irrigation complex, water-saving technologies, agricultural development.*

1. INTRODUCTION:

Achievements of sustainable development of agriculture and food security in the conditions of the arid zone largely depend on the state and functioning of the ameliorative and irrigation sector of the agrarian economy, requiring a significant amount of investments. Reduction of investments in equipping the water sector and updating the ameliorative-irrigation complex led to a deterioration of the technical and economic condition of irrigated agriculture, untimely work on maintaining the efficiency of collector-drainage systems, increasing the loss of irrigation water and crop yields, and as a result, reducing the efficiency of agricultural production in general. Violation of the principles of stability of land reclamation measures and the lack of in-depth analysis of the causes of deterioration of the parameters of the reclamation and irrigation complex also lead to increased degradation of agro-eco-systems, ecological imbalance, and lower quality and quantity indicators of agricultural production.

2. LITERATURE REVIEW:

A number of studies by Russian and Russian scientists and economists are devoted to improving the environmental and economic efficiency of the land-reclamation and irrigation complex. A significant contribution to the solution of the theoretical and methodological aspects of the problem was made by Russian scientists K.P. Arent, S.N. Bobylev, A.B. Golubev, V.A. Dukhovny, N.Ya. Kovalenko, V.N. Krasnoshchekov, E.G. Lysenko, G.I. Chogut et al., As well as foreign authors L. Brown, J. Liebig, B. Commoner, G. Odum, S. Postel, and others.

Various aspects of the problem of optimizing the relationship of economics and ecology, increasing the efficiency of land and water resources use are described in the works of Russian scientists I.A. Asrorov, V.V. Vakhidova, T.B. Ganieva, H.G. Gafurova, K.K. Davlatov, Kh.R. Isaynova, P.P. Kudratova, A.A. Madaminova, N.T.Mirakilova, R.Nosirov, Kh.A.Odinaeva, J.S. Piriyev, S.R.Pirov, E.N. Sheralieva and others.

3. METHOD:

The theoretical and methodological basis of the research is the works of the classics of economics, foreign, Russian and Uzbek scientists and economists on the problems of the effectiveness of agricultural development and its amelioration and irrigation support in the conditions of the arid zone. Ecological and legal acts of the Republic of Uzbekistan, resolutions of the Government of the Republic of Uzbekistan, data from the Statistics Agency under the President of the Republic of Uzbekistan, as well as data from the Ministry of Energy and Water Resources of the Republic of Uzbekistan, the Ministry of Agriculture of the Republic of Uzbekistan, the Land Improvement and Irrigation Agency Government of the Republic of Uzbekistan, Institute of Water Problems, Hydropower and Ecology of the Academy of Sciences of the Republic of Uzbekistan, PROO materials N (Millennium Development Goals (2018), Environmental Performance Review of Uzbekistan (2018), Needs Assessment (2016)), materials of the Asian Development Bank, annual reports of agricultural enterprises and water management organizations of the Republic of Uzbekistan.

4. DISCUSSION:

When using the proposed new and innovative methods of irrigation creates the possibility of a continuous supply of plants with water, and if necessary, and nutrients. Dosed water supply during the irrigation period allows you to create the necessary moisture regime, increase crop yields.

Longline unconventional watering of intensive orchards and vineyards has significant privileges: significant (up to 30-50%) savings of irrigation water and local soil moistening, whereby the soil is moistened in the root zone of the plants, dry aisle allows to carry out mechanized works without hindrance; irrigation erosion is prevented, as well as soil suffixation, soil porosity is not disturbed; possibility of full automation of the method, simplicity and accessibility in its use

5. MATERIALS, ANALYSIS:

One of the major problems facing our society is the food program. Its decision is inextricably linked with the intensification of agricultural production due to the radical improvement of agricultural land, more efficient use of irrigated land, the introduction of advanced machinery and technologies, and increased labor productivity.

On October 29, 2007, a decree of the President of the Republic of Uzbekistan “On measures of fundamental change and improvement of land-reclamation condition” was issued, the main focus of which is as follows:

It provides for a significant increase in funds and resources for ameliorative improvement of irrigated land. In connection with the cessation of work on the transfer of part of the flow of northern and Siberian rivers, the construction of neighboring reservoirs like Kyrgyzstan and Tajikistan, the largest reservoirs in Central Asia, further development of irrigated agriculture will occur only at the expense of available inland water resources.

An analysis of the current state of irrigation systems in traditional irrigation areas and the level of their operation allows us to state that there are serious shortcomings in the rational use of water resources taken from irrigation sources. In the conditions of the present shortage of water resources, it is necessary to find ways of economical irrational use of irrigation water.

In this connection, the aforementioned decree is aimed at intensifying agricultural production. The first stage is the development, design and implementation of highly efficient water-saving technologies, that is, drip irrigation systems, irrigation with flexible hoses, sprinkling irrigation, irrigation of agricultural crops along short furrows, unconventional irrigation of intensive gardens, garden gardens and vineyards on adyr land.

With these new, modern and non-traditional irrigation methods, the possibility of a continuous supply of plants with water and, if necessary, with nutrients, is created. Dosed water supply during the irrigation period allows you to create the necessary moisture regime, increase crop yields.

The main advantages of these modern and non-traditional irrigation methods are: - significant (up to 30-50%) savings of irrigation water and local soil moistening, whereby the soil is moistened in the root zone of the plants, the dry row spacing allows to carry out mechanized works without any obstacles. you can irrigate steep slopes and land with subsiding soils without interference; improves the uniformity of water distribution in the area.

According to statistics, by the end of 2014 in Uzbekistan there are:
-51% -2191.7 thousand hectares of non-saline,
-31% -1354.7 thousand hectares of low salinity,
-15% - 652.8 thousand hectares of average salinity,
- 3% - 125.9 thousand hectares of highly saline irrigated land.

On the basis of the aforementioned decree until 2014, the reclamation condition of 1,200 thousand hectares of irrigated land was improved.

The use of new methods of washing saline soil and new irrigation equipment in saline areas allowed to lower the level of groundwater in the territory of 364.6 thousand hectares. The possibility of re-salinization of irrigated land was warned by increasing the salinity of groundwater.

For the selection and application of the above new methods of irrigation techniques, it is important to have information about the degree of salinity of groundwater in saline soils.

It is known that

- in non-saline soil the degree of salinity is less than 2 g / l;
- in lightly saline soil the degree of salinity is 2-4g / l;
- in moderately salted soil the degree of salinity is 4-8 g / l;
- in highly saline soil the degree of salinity reaches 8-16g / l;

When growing and watering crops, to prevent the rise of groundwater in saline soils, it is necessary to take into account all the norms of irrigation equipment for each crop separately. Naturally, irrigation should be targeted, eliminating soil erosion, without disturbing the fertile soil layer.

Taking into account the above, in order to preserve land from erosion, as well as to save water resources, the following new irrigation methods are proposed:

1- surface irrigation method with a regulatory network in the earthen channel along short irrigation furrows;
2- irrigation using flexible hoses;
3- closed irrigation network with irrigation by flexible hoses;
4- sprinkler irrigation;
5- drip irrigation;
6- tier non-traditional watering of gardens and vineyards.

For highly productive use of water resources, when growing various crops, special attention should be paid to the following:

- the right choice of the technical scheme for the distribution of water resources;
- sufficiently accurate determination of elements of the selected irrigation technique;
- taking into account the particular conditions and characteristics of the soil of agricultural lands;
- more often to introduce night watering, at which 99 percent absorption occurs;
- it is desirable to keep the average day of the irrigation period within 24-30 hours not more;
- Strict supervision of irrigation of irrigated lands is proposed, otherwise irregular irrigation of furrows in some places may be possible.
- It is proposed to apply chemical fertilizer shortly before watering;
- Cultivation, carried out immediately after irrigation, retains soil moisture for a long time.

Let's stop on non-traditional watering of gardens and vineyards.

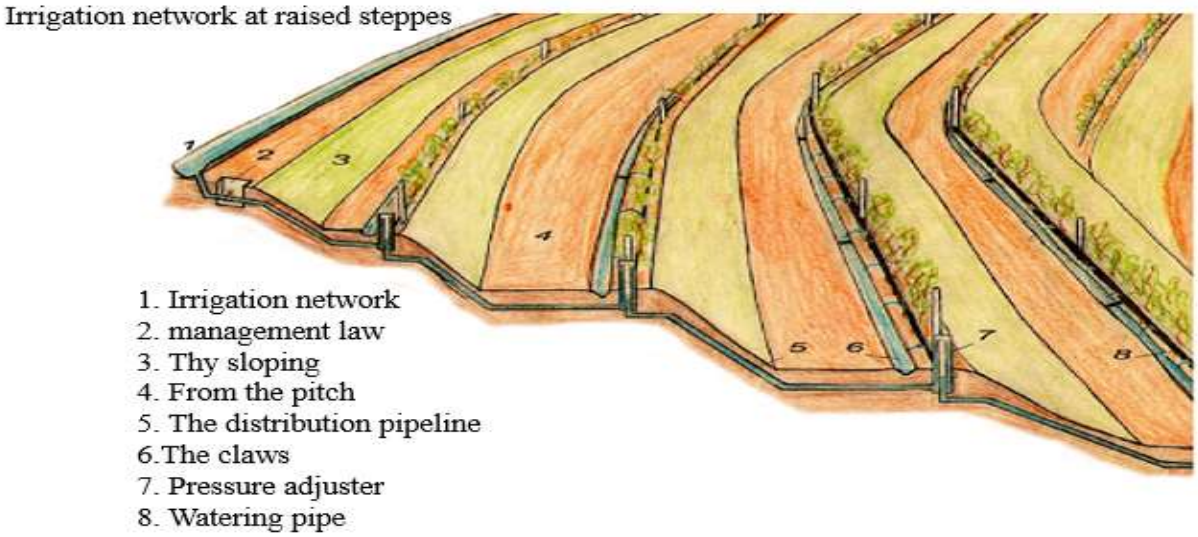

Рис-1 Irrigation network at raised steppes

The scheme of the proposed technology and technology of irrigation of intensive gardens and vineyards planted on a hole and its terraced slopes (Fig-1) (Fig-2).

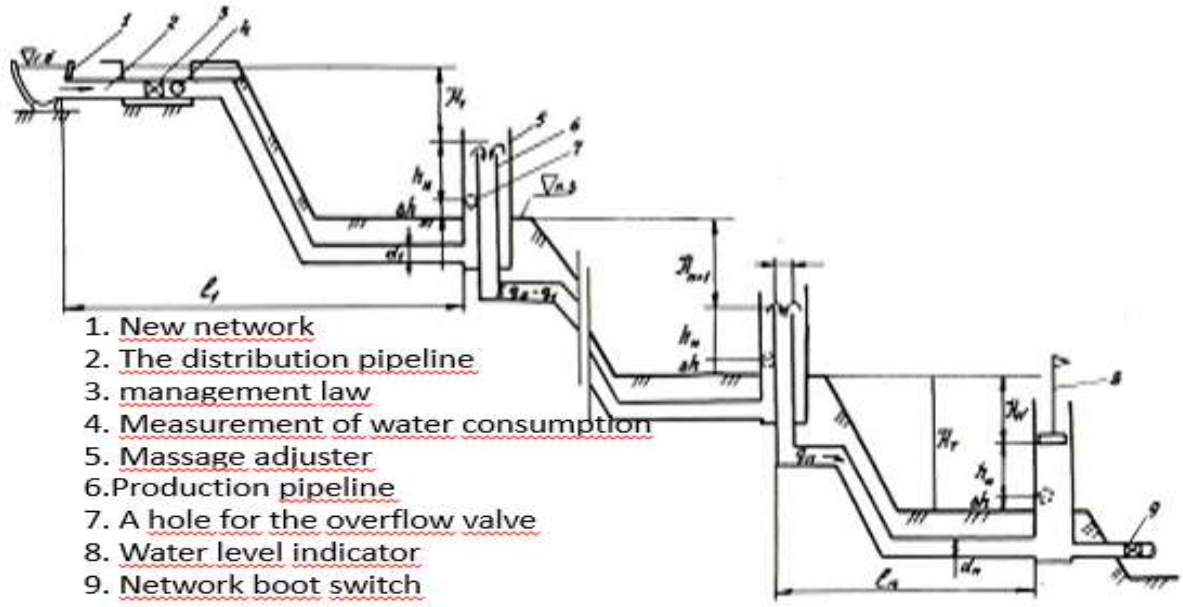

Fig-2. Scheme of calculation of the leaked distribution network

The design scheme of the distribution system on terraced adyrny slopes

6. RECOMMENDATIONS:

Longline unconventional watering of gardens and vineyards has the following advantages:

- it is possible to irrigate steep slopes without hindrance

-CZI increases significantly.

- low energy consumption;

-improves the uniformity of water distribution over the area, without disturbing the porosity of the soil;

This watering of orchards and vineyards is applied in areas where other known methods are unacceptable: in the foothill areas, with different slopes, in areas with insufficient water supply

The main technical indicators for non-traditional irrigation of intensive gardens and vineyards planted on adyry and its terraced slopes are as follows:

1.-distributive part of the irrigation system to carry out 50-75 mm, the regulating part of the 25-32 mm polyethylene pipes creating, 100-250 mm head;

2.-technical irrigation elements: - the main hydraulic elements (flow, irrigation length, distribution speed) are determined strictly on the basis of hydraulic calculations

3.-the coefficient of useful water increases to 0.98, there is no water discharge.

4.-moistening of the soil along the rows of front gardens reaches 0.96%

7. CONCLUSION:

Longline unconventional watering of gardens and vineyards has the following privileges: significant (up to 30-50%) savings of irrigation water and local soil moistening, whereby the soil is moistened in the root zone of the plants, dry aisle allows mechanized work to be carried out without hindrance, irrigation erosion is prevented, as well as soil suffusion; the possibility of fully automating the irrigation method since the construction consists of pipelines; Irrigation can be carried out directly from open wastewater, since it does not have special requirements for its turbidity, the principle of operation of unconventional irrigation is quite simple and is available for independent use to any farmer.

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