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Improvement of Water Usage Plans in the Republic of Uzbekistan

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Abstract: *The internal economic plan of water use of farms is an integral part of the business plan. Therefore, the correctness of the water use plan of the farm depends on the efficient use of land and water resources, labor resources, material, technical, financial and other resources. In addition, the quality structure and implementation of the water use plan will depend on the reclamation, ecological, sanitary-epidemiological and social conditions of the farm. The internal economic plan of water use is the basis of the systematic plan. Therefore, it is necessary to carefully study the natural-economic conditions for the current year when considering the internal economic plan of water use of farmers and other farms. In our and foreign countries' economic experiences, we can see that the domestic economic plan for water use is applied for the growing season and the calendar year. There are also long-term water use plans for farms for the next 3 or 5 years.*

Keywords: farming, irrigation, land reclamation, water, specialist, use, experiment, analysis, vegetation, farming.

INTRODUCTION

The following is an analysis of the rapid water use methodology developed by IWMI experts. This technique is illuminated by two formulas. These formulas determine the scope of services provided by farmers based on the following:

1) depending on the irrigated area. In this case, the tariff is determined according to the following formula:

$$K_{ПИУ\omega} = \frac{СЗ_{АВП}}{\sum_{i=1}^{N} \omega_i} \quad (1)$$

Here, KPIU$_{\omega}$- payment for irrigation services (tariff set by the SIU for farm services), sum / ha; SZAVP- Sum of annual expenses of SIU, tys.sum;$\Sigma\omega_i$- The sum of the irrigated areas of the SIU, tys.ga. According to this methodology, the PIU of a farmer is equal to:

$$ПИУ = K_{ПИУ}\omega_{Ф} \quad (2)$$

Here

ω- total area of irrigated lands of the farmer, ha

2) Depending on the volume of water taken. In this case, the tariff for services is calculated as follows:

$$K_{ПИУW} = \frac{СЗ_{АВП}}{\sum_{i=1}^{N} W_i} \quad (3)$$

Here, the sum of annual water volumes obtained from Wi - SIU, tys.m3.

The value of SIU's services to farmers is determined by the following formula:

$$ПИУ = K_{ПИУW}W_{Ф} \quad (4)$$

Here, W is the sum of the annual water volume taken by the farmer from SIU, cubic meters.

MATERIALS AND METHODS

Disadvantages of the methodology include:

- The larger the area of irrigated land, the more farmers will have to pay. Even if a farmer's land in terms of productivity is worse than that of another farmer's land with high productivity but small area, he still has to make the same fixed payments;
- The more water is taken into the SIU, the lower the water tariff. This does not take into account the level of water supply to the farmer;
- Water transfer method - not taken into account by pump or by itself;
- the amount of water needed by agricultural crops, depending on the type, is not taken into account, for example, how much water cotton or rice requires;
- Payments for ITB services for water supply to SIU have not been determined.

By scientists of the Institute of TIMI (Umurzakov UP, Baraev FA, Sultanov AS, Sherov AG), the normative size of costs (tariffs) for services on SIU is determined on the basis of the following formulas:

$$K_{АВП} = \frac{СЗ_{АВП}}{\sum_{i=1}^{N} W_{ЛИМi}} \quad (5)$$

Here, SWlimi is the annual volume of limited water consumption per SIU, tys. m3.

Farmers' expenses:

$$ПИУ = СЗ_{АВП} \frac{Б_{Ф}}{Б} \left(\frac{W_{ФФ}}{W_{ФЛ}} \right)^{n} \quad (6)$$

Here, Bf is the bonitet of farmland; B is the average quality of the lands according to the SIU; Wff is the existing gate (zabor) of water allocated to farmers; n is the water supply level of the SIU area (n = 1). Wfl- farmer's limited water gate.

However, even these methods, despite their novelty and relevance, are not without a number of unresolved problems that make them difficult to implement in production.

First of all, the value of the coefficient n remains uncertain. Water transfer method - not taken into account by pump or by sewage; the volume of water consumption of agricultural crops (cotton, rice, etc.) has not been determined, the value of payments for the use of collector-drainage and groundwater has not been determined, and the fees for ITB services for water supply to SIU are not clearly defined.

The next development of this work was F.A. Baraeva and R.A. This is reflected in the research of Muradov [227, 228]. Payment for irrigation services should be calculated in several stages in accordance with the recommendations of the above authors.

In the first stage, the farm's point quality coefficient is determined:

$$K_{Бф} = \frac{Б_{ф} \sum_{i=1}^{N} \omega_{фi}}{\sum_{i=1}^{N} Б_{фi} \omega_{фi}} \quad (7)$$

Here, BF, ω_F - points bonitet and area of the farm.

In the second stage, we determine the coefficient of the water transfer method:

$$K_{СВi} = \frac{W_{Ci}}{W_{i}} \quad (8)$$

Here, Wi, Wci are the total and wastewater volumes consumed by the farm.

In the third stage, the utilization rate of water from the SIU irrigation network is:

$$K_{ОРСi} = \frac{W_{орci}}{W_{i}} \quad (9)$$

In the fourth stage, the coefficient of holding the limit:

$$K_{Фi} = \left(\frac{W_{ффi}}{W_{лимi}} \right)^{n} \quad (10)$$

Wff, Wfl - available and limited water gate (volume) of the farmer. n is the level indicator and depends on the level of water shortage in the SIU. The authors recommended the following level indicators:

$K_{лим}^{АВП}$	1.0-0.86	0.85-0.71	0.70-0.56	0.55-0.41	0.40-0.26	0.26>
N	1.0	2	2.5	3	3.5	4

And the fifth stage, the coefficient of proportionality:

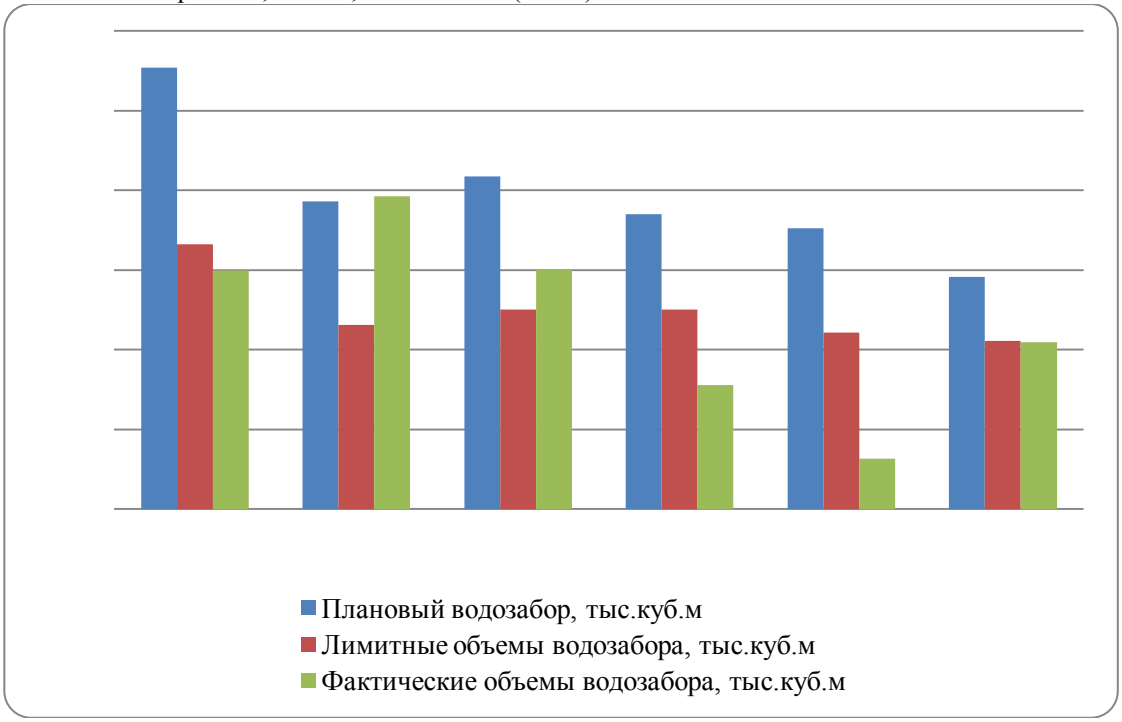
$$K_{АВП} = \frac{\sum_{i=1}^{N} K_{Бфi} K_{СВВ} K_{ОРСi} K_{Фi}}{N} \quad (11)$$

Here N is the number of farms in the SIU.

RESULT AND DISCUSSION

Below are the regions and districts of the Republic, depending on the level of farms, different levels of water supply,

different levels of use of sewage and pump irrigation, collector-drainage and groundwater, as well as the type of crop - cotton, etc. or the results of planned, limited, and available (actual) water transfer volumes based on the rice's different water needs.



Picture. 2.1.1. Planned, limited and available (actual) water volumes of farmers of Bukhara region

Different levels of water supply, different levels of use of sewage and pumped irrigation methods, collector-drainage and groundwater, as well as depending on the type of crop - cotton, etc. or similar calculations of normative and existing tariffs are carried out at SIU, depending on the planned, limited and available (actual) water transmission volumes, depending on the different water needs of the rice.

CONCLUSION

Irrigated lands should be zoned according to the level of water supply. Pricing for the following systems:
- machine irrigation system;
- Irrigation system from reservoirs;
- Groundwater irrigation system;
- Irrigation system with wastewater and collector-drainage water;

Development of water supply regime for irrigation of agricultural crops, taking into account the expected market conditions of agricultural products. Addressing issues related to interstate water distribution, including the development of a mechanism to cover the costs associated with the management of international water resources, modernization and operation of a complex of hydraulic structures of international class, as well as the existing and accepted international standards and laws. It is necessary to clearly define.

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