

THE IMPORTANCE OF SAVING WATER USED FOR IRRIGATION IN IRRIGATED AGRICULTURE AND PROPER DISTRIBUTION OF WATER RESOURCES BY SECTORS

Z.Kodirov¹, I.Oripov², Sh.Avezov³, M.Kurbonov⁴

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Global climate changes occurring on our planet affect the quantity and quality of water resources. This will require the development of more efficient water-use technologies around the world. In the years of independence, it became a priority to rely on modern, scientific solutions in the organization of preservation and protection of existing water resources in our country. As part of these works, the decision of the Cabinet of Ministers of the Republic of Uzbekistan No. 714 of September 10, 2018 "On measures to ensure the introduction of modern information, communication and innovative technologies on water management system" was adopted. Resolution of the President of the Republic of Uzbekistan No. 3823 dated July 2, 2018 "Measures to increase the efficiency of water resources use" was adopted. These decisions serve as a program for saving water resources in all sectors of industry and communal economy. In 2018, many significant results were recorded in the implementation of decisions in Bukhara region. Currently, taking into account the complex geological and hydrogeological conditions of the region, experts in the field are conducting a lot of scientific research on saving water resources. It is important to correctly direct the available water resources in the region by sector. For example, if we rely on the information of the Amu-Bukhara Irrigation Systems Basin Department in the distribution of water received annually from the sources, the total amount of water resources received in the region in 2018 was 4346.4 million m³. The formation of this amount is as follows.

Formation of water resources in Bukhara region. (2018) Table 1.

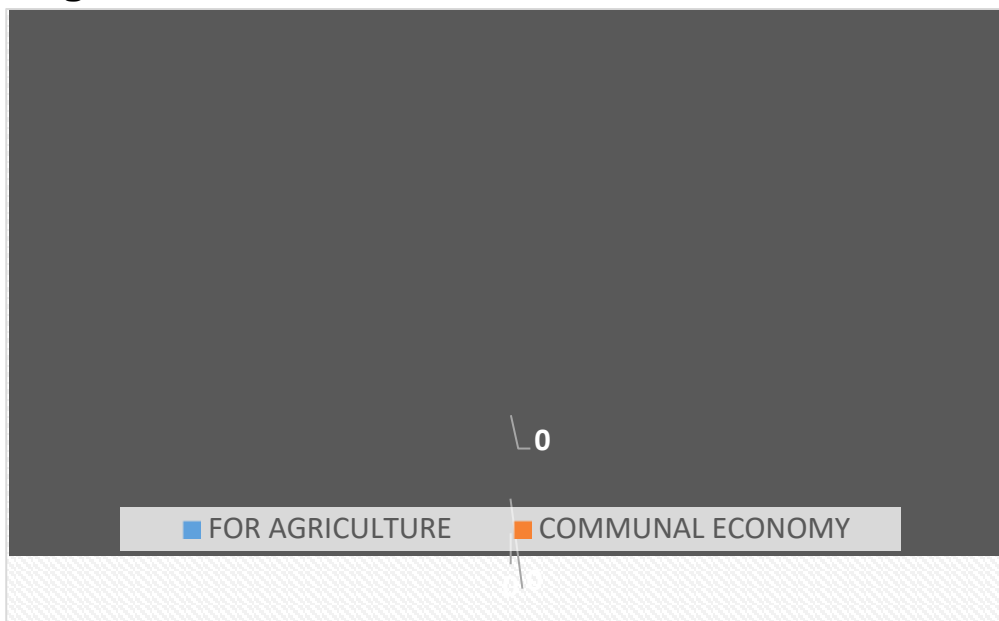
№	Formation of common water resources	The volume million m³
1	Rivers	3721,1
2	Inland streams and rivers	423,5
3	Groundwater	72,9
4	Collector water	128,9

If we conclude from the given information, trans boundary rivers (Amu Darya) are of great importance in the formation of water resources used in the region.

In terms of the rational distribution of this amount, the supply of water to consumers and users according to the norm, the following distribution was carried out in the Amu-Bukhara ISBA(Irrigation Systems Basin Authority).

Distribution of water resources by sectors in Bukhara region (2018)

Diagram 1



Concluding from this distribution, since the main part of water in the region is used for agriculture, in particular, for irrigation farming, it is important to apply modern resource-saving technologies to the sector. It is necessary to use effective irrigation methods and technologies created by experts in the field in recent years. In particular, the techniques of drip irrigation, sprinkler irrigation, sub-irrigation in furrows, moisture-retaining hydrogel irrigation techniques are currently the most effective methods.

Drip irrigation

Drip irrigation method is an engineering irrigation method designed to deliver the appropriate amount of water to the root layer of the crop with the help of hoses. During drip irrigation, the water is delivered not to the entire field, but to the part of the field where crops are grown, to the root layer of the crop. Along with water, nutrients are also given in a dissolved state. In such conditions, the water reaches the crops completely without wasting nutrients. In all parts of the field, the crop develops uniformly and gives a stable yield. When the crops are irrigated by drip, water is not absorbed into the soil in vain, and water is not

released from the field. As a result, a large part of the water planned for irrigation is saved.

During drip irrigation, water is saved due to the following:

- The amount of water for irrigation (irrigation rate) is adapted to the daily water demand of the crop (irrigation rate and duration are determined based on the calculation of actual evaporation and transpiration);
- Since water is given directly to the layer where the root of the plant develops, the wetted area decreases;
- Water evaporation from the soil surface is reduced due to the fact that a large part of the crop field remains dry;
- Due to the reduced development of weeds in the field, only the crop receives all the water given for irrigation;
- Absorption of water for irrigation into the soil is reduced;
- There is no water coming out of the field.

In drip irrigation, only the part of the field planted with crops is irrigated (the crop is irrigated, not the field). For example; 35-70 m³/ha (on average 50 m³/ha) of water is used to irrigate 1 hectare of garden once. During the whole season, the garden is irrigated 60-70 times, which means that with drip irrigation, about 2 times more than usual less water is used. As a result, during drip irrigation, compared to other irrigation methods, depending on the type of crop, 20% to 50% of water is released.

Watering by sub-irrigation in the furrows

When irrigating by sub-irrigation in the furrow, it is possible to deliver water to the root layer of the crop faster without wasting water, and moisture evaporation after watering is prevented. The film, which is used for irrigation, is produced by "Jizzakhplastmassa" OJSC as a set. The amount of film used for covering one hectare of cultivated area is on average 60-65 kg/ha.

The peculiarities of watering by laying a film in the furrows:

- Furrows are evenly moistened along their entire length;
- The amount of waste water is significantly reduced;
- There is no need to take the seeds in a short distance in the field;
- Evaporation of water from the soil surface is reduced;
- Irrigation between crop rows is not carried out with the help of machinery;
- Consumption and total amount of water used for irrigation is reduced.

Irrigation through moisture-retaining hydrogel



Hydrogel is a synthetic polymer with high permeability in water, which allows to store a large amount of moisture in the soil for a long time. Water that has passed to the soil through atmospheric precipitation or irrigation is stored in a state where it can easily reach the roots of plants. The hydrogel product is mainly synthesized on the basis of local raw materials available in our country. For this reason, compared to imported similar products, the price is 8 times cheaper, but it does not differ in terms of features. Rainwater absorbs 200-300 times its own weight, and most soils absorb up to 200-250 times more water depending on the amount of different salts in the soil. In practice, 10 grams of polymer can hold 2 to 4 liters of water. The use of hydrogels, which contain mineral fertilizers, micronutrients and plant protection agents against various diseases and weeds, increases the possibility of rapid germination of lawns in almost all plants, development and productivity. As a result, a huge amount of mineral fertilizers and water is saved, groundwater pollution is prevented. The most important thing is that it is possible to plant crops on previously unusable lands and harvest them.

In conclusion, it should be said that the observed water shortage in the Republic has a significant impact on the Bukhara region. In such conditions, it is important to properly distribute water resources across sectors and manage them. It is the duty of every citizen to use efficiently every drop of water, which is the source of life.

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