

The Current State Of Irrigation Networks And Their Use In The Water Sector Of The Republic Of Uzbekistan

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Abstract

The service period of most water infrastructure facilities built in the country is more than 50-60 years, and their technical condition is deteriorating every year. In particular, most of the canals of irrigation systems are going for filtration by soil, and seepage losses remain high. In addition, 77 percent of the canals of the irrigation system require repair and rehabilitation, and 20 percent - reconstruction. 77% of irrigation networks of associations of water users and farms are ground, 44% of the network needs repair and rehabilitation, 10% of the network needs reconstruction.

Most of the existing u-shaped canal networks have been in operation for more than 30 years and 70% of them require reconstruction and replacement. This article analyzes the above scientific and technical problems.

Key words: water infrastructure, filtration, u-shaped canal networks, reclamation facilities, investments.

Introduction

There are 4.3 million hectares of irrigated areas in the Republic of Uzbekistan, and their water supply is carried out through a complex system. In particular, out of a total length of 183.7 thousand km of irrigation networks, 13.1% are with concrete cover, 76.3% are with soil cover and 10.6% are u-shaped canals. Of these, 28,570 km of canals belong to water management organizations (Figure 1), 155,154 km of irrigation networks are managed by water consumer associations, clusters and farms (Figure 2) [2,3]. Uzbekistan is considered as one of the largest irrigation farming countries in Central Asia. Proper use of existing water and land resources can increase crop production and yields in the agriculture sector [4].

Today, 35-40 percent of the fixed assets of irrigation systems are obsolete. In the average hydrological water supply, the state of reliability

of the irrigation system in terms of water supply per hectare is 0.3-0.31. According to the analysis of materials and studies of the fund, the failure of the resource base of water facilities causes damage to agricultural production by an average of \$1.0 billion.[5].

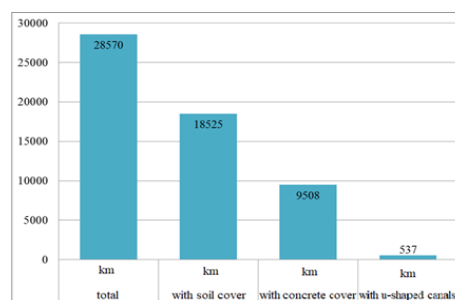


Figure 1. Irrigation networks administered by water management organizations

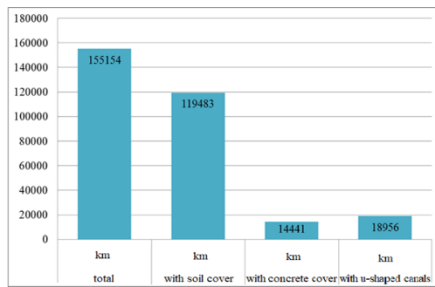


Figure 2. Irrigation networks owned by water user associations, clusters and farms

Table-1 Territorial distribution of irrigation systems owned by water consumer associations, clusters and farms

№	Name of regions	Length, km.	consequently:				The total number of hydrotechnical structures in the irrigation network, pcs.
			with soil cover	with concrete cover	u-shaped canals	closed pipeline network	
1	Republic of Karakalpakstan	18933	18852	14	67	-	9597
2	Andijan	10552	8399	353	1440	360	10250
3	Bukhara	14977	12229	1328	1416	4	11546
4	Jizzakh	4502	268	456	3451	327	1183
5	Kashkadarya	20450	11143	2206	6237	864	13383
6	Navoi	2104	1688	203	213		2023
7	Namanagan	9590	8132	482	683	293	7729
8	Samarkand	14504	13650	705	149		1890
9	Surkhandarya region	10996	7605	2828	458	104	14827
10	Syrdarya	5861	3319	464	2041	39	9476
11	Tashkent	12055	6168	4241	1377	269	11577
12	Fergana	16434	14105	1068	1246	15	13184
13	Khorezm	14195	13923	93	179		7385
	Total	155153	119483	14441	18956	2274	114050

The service life of most water infrastructure facilities built in the country has exceeded 50-60 years, and their technical condition is deteriorating every year. In particular, most of the canals of irrigation systems are filtrating by soil, and seepage losses remain high. In addition, 77 percent of the canals of the irrigation system require repair and rehabilitation,

and 20 percent - reconstruction.[6].

When using canals, it is important to assess quantitative indicators of the state of reliability associated with such adverse effects as wear of canal dams under the influence of dangerous filtration currents, subsidence, and elevation of canal sections relative to the area [7]. 77% of irrigation networks of associations of

water users and farms are in poor condition, 44% of the network is in need of repair and rehabilitation, 10% of the network is in need of reconstruction.

Most of the existing u-shaped canal networks have been in operation for more than 30 years and 70% of them require reconstruction and replacement.

The efficiency of the irrigation system and irrigation networks is on average 0.63, and in some areas even lower, where 35-40% of water from the main sources is lost in the irrigation

network. [1].

Study area

On the territory of the Republic of Uzbekistan, there are 512 enterprises for the production of building materials, products from concrete-artificial stone and prefabricated building blocks (Figure 3), which in 2018-2021 produced 6507 thousand pieces of reinforced concrete products of various sizes and shapes, 1830 thousand m³ aerated concrete blocks.

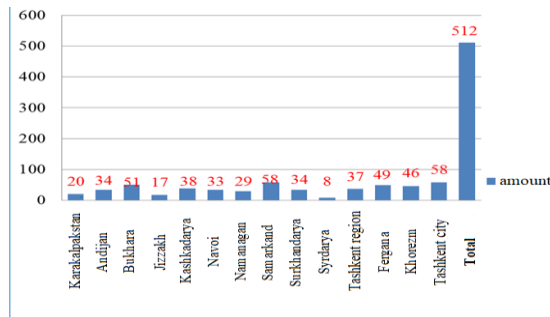


Figure 3. Enterprises for the production of building materials, concrete-artificial stone products and prefabricated building blocks

Despite the large number of enterprises producing building materials, concrete-artificial stone products and prefabricated building blocks in the country, the number of enterprises producing u-shaped irrigation canals for water resources management is only 12 (Figure 4).

The annual production capacity of these enterprises is 52.6 thousand units or 316.0 km. For more than 40 years, 17.1 thousand km of flume networks have been built in the water sector, and today 4.3 thousand km or 25% are in need of rehabilitation.

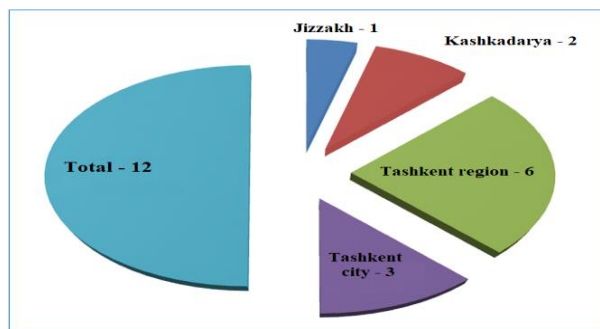


Figure 4. Enterprises producing reinforced concrete u-shaped canals

There are many problems with the timely supply of guaranteed water to territories connected to emergency flume networks, which leads to excessive transfer of water resources. Annually it is necessary to rehabilitate 600 km of u-shaped canal networks. It will take 15 years to restore the tray networks, which are in an emergency condition, at existing production facilities.

Results and discussion

In recent years, consistent measures have been taken in the country to reform the water sector, rational use of water resources, state support for the implementation of water-saving technologies. In particular, tough measures are being taken to develop water infrastructure. 5,755.7 billion Uzbek sums (UZS) were allocated from the republican budget for the construction and reconstruction of irrigation and melioration facilities in 2017-2021 within the framework of investment programs. Also 4,374.4 billion UZS

were allocated for the construction and reconstruction of irrigation facilities, 2,782.6 km of canals, 554.6 km of flume networks, pumping stations with a total capacity of 62.8 m³/s, 546 vertical irrigation wells and other hydraulic structures. and reconstructed. As a result, the technical condition of irrigation networks and water supply of 1.43 million hectares of irrigated land has improved.

Conclusion:

According to the directives, the priorities for the construction, reconstruction and improvement of water management facilities, in particular irrigation systems, in 2022-2026 have been determined. To implement these measures, 6,980.9 billion UZS will be allocated from the republican budget for the construction of 2,998 km of canals, 627 km of u-shaped canal networks, pumping stations with a total capacity of 86.7 m³/s, 206 irrigation wells, 286.7 million m³ will be built and reconstructed reservoirs and other water bodies.

As a result, the technical condition of irrigation networks will be improved, the efficiency of canals and irrigation networks will be increased from 0.64 to 0.69, water supply of 795.9 thousand hectares of irrigated lands will be improved.

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