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TECHNOLOGICAL CHARACTERISTICS OF IRRIGATION SYSTEMS IN THE FIELD OF WATER MANAGEMENT AND THE CURRENT STATE OF THEIR USE

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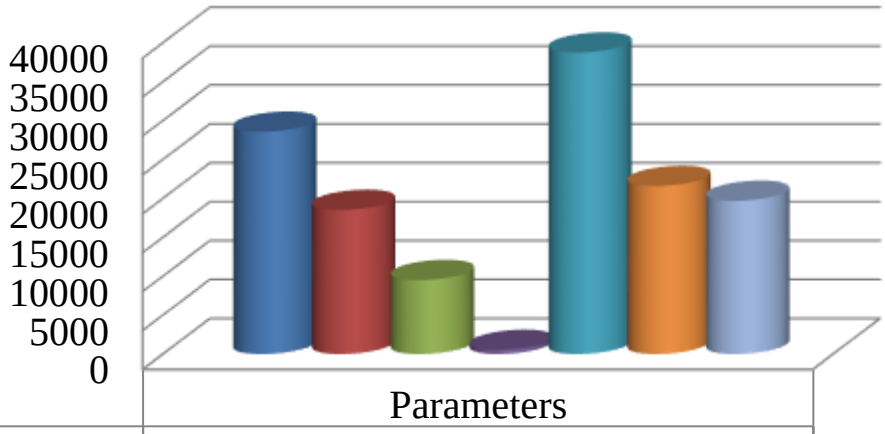
Abstract:

At present, the total length of irrigation networks operating in the system of the republican water management is 183.7 thousand km, of which 75.1% are earth canals, 13% are channels with concrete coating, 10.6% are channel networks, 1 .3% - water supply networks, and 1.3% is located in this irrigation system. The total number of gauging stations is 60.8 thousand units. The total efficiency of the irrigation system is 0.64, including the total efficiency of irrigation networks run by water management organizations is 0.68, and the total efficiency of irrigation networks run by ISI and bushes is 0, 57. This situation requires an assessment of the technical condition of irrigation networks in the water management system and carrying out restoration measures based on innovative technologies. This article presents a technological description of irrigation systems in the field of water management and an analysis of the current state of their use.

Keywords: Irrigation networks, canals, water, irrigation systems, hydraulic structures, soil, water resources.Irrigation networks are a complex that provides water supply from a water source to a consumer and is associated with hydraulic structures and devices (water intake facilities, units for regulating and measuring water flow, pumping stations, etc.).

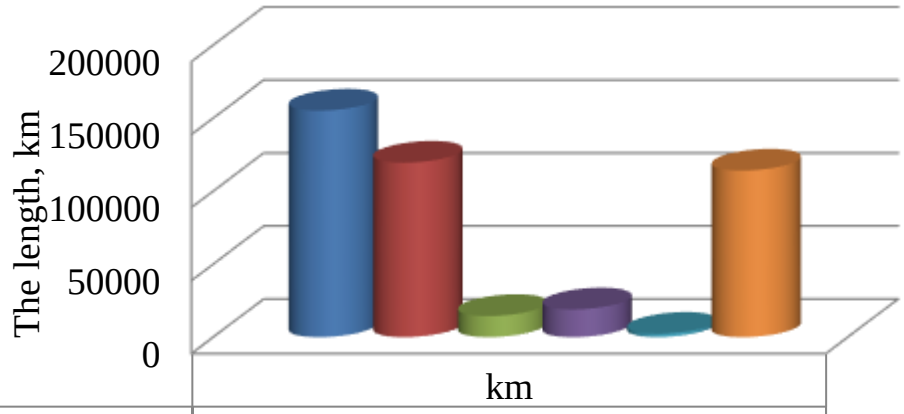
Irrigation networks are divided into two component groups: inter-farm and on-farm irrigation networks. Irrigation networks of these groups have functional, economic and legal characteristics, based on their tasks. That is, canals and structures that are managed by water management organizations and managed by water user associations (WUAs) and clusters. However, despite their legal and economic affiliation, these irrigation networks operate as a single technological system.

At present, the total length of irrigation networks administered by water management organizations is 28.6 thousand km (Fig. 1), and the total length of irrigation networks administered by IPOs and clusters is 155.2 thousand km (Fig. 2).



Total, km	28570
soil direction, km	18525
With concrete cover, km	9508
Tray networks, km	537
HTF, piece	38735
Water intake points, piece	21599
Hydroposts, piece	19688

Figure 1. Canals and hydraulic structures in them at the expense of water management organizations



Total	155153
soil direction	119483
covered with concrete	14441
tray networks	18956
pipe network	2274
number of HTF in irrigation network	114050

Figure 1. Regional distribution of the irrigation system owned by water user associations, clusters and farms

It has the following technological characteristics, regardless of its design solutions, purpose, dimensions, operating conditions:
Functional tasks that determine the interdependence of irrigation systems, compatibility of technological processes of water transmission and water distribution;

Structural uniformity of water intake and transmission structures, hydraulic structures, hydromechanical devices, water accounting and measuring devices;
The dynamic nature of water movement in canals and structures, which has a significant impact on the management of technological processes of water transmission and distribution.
Efficient and rational use of water resources depends on the actual technical and technological (automated, digitized, etc.) condition of irrigation networks and their facilities.
Automation and digitalization of technological processes in irrigation systems creates the possibility of equipping the system with measuring equipment, obtaining and analyzing data, as well as managing water supply and water consumption as a single complex.
The formation of a digital economy in the system is one of our priority tasks to ensure the full implementation of the tasks defined in the strategy of our state "Digital Economy-2030".
In 2021 alone, 3,121 water metering stations were equipped with Smart Water devices (101 percent of the planned 3,099).
Management processes 21 water facilities
(105 percent compared to 20 plans) are automated.
454 pumping stations with operational water level control devices have been installed (107 percent against 426 plans).
In addition, 2412 reclamation control wells are equipped with devices for operational monitoring of the level of seepage water and the level of salinity (99% against 2435 plans).
The information system "Center of Conditions" was created and put into operation in a test mode, consisting of 5 modules covering all information systems in the field of economics of the CCM.
In 2021, the integration of digital devices installed in the republic with the servers of the ministry was completed to ensure the fulfillment of the established forecast indicators for the introduction of digital technologies on the ground, their control, maintenance, development of information systems, and their improvement will be completed and information on water resources in irrigation networks will be completed, a system of analysis and management of water supply and water consumption is being created as a single complex [1,2].
In addition, the service life of most water infrastructure facilities built in the republic has increased from 50 to 60 years, and their technical condition is deteriorating every year. In particular, 66 percent of the canals of irrigation systems are earthen, and seepage losses remain high. In addition, 77 percent of the canals of irrigation systems require repair and rehabilitation, and 20 percent - reconstruction.
77 percent of water user associations and farm irrigation networks are earth, 44 percent of networks need repair and rehabilitation, and 10 percent of networks need reconstruction.
The efficiency of the irrigation system and irrigation networks is on average 0.63, and in some regions it is even lower, and 35-40 percent of water from the main sources is lost in irrigation networks [1].
The main part of the existing flume networks has been in operation for more than 30 years, 70% of them require reconstruction and replacement.

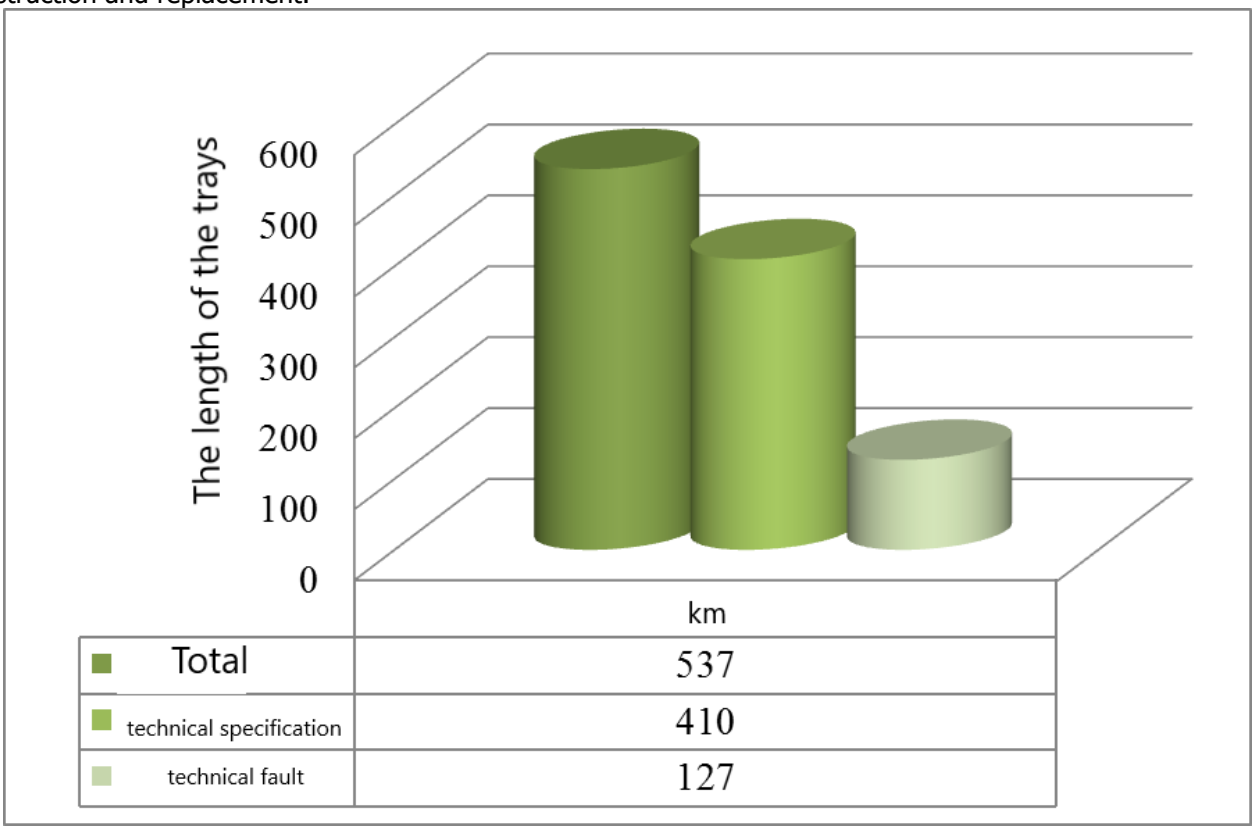


Figure 3. Technical condition of irrigation flumes owned by water management organizations

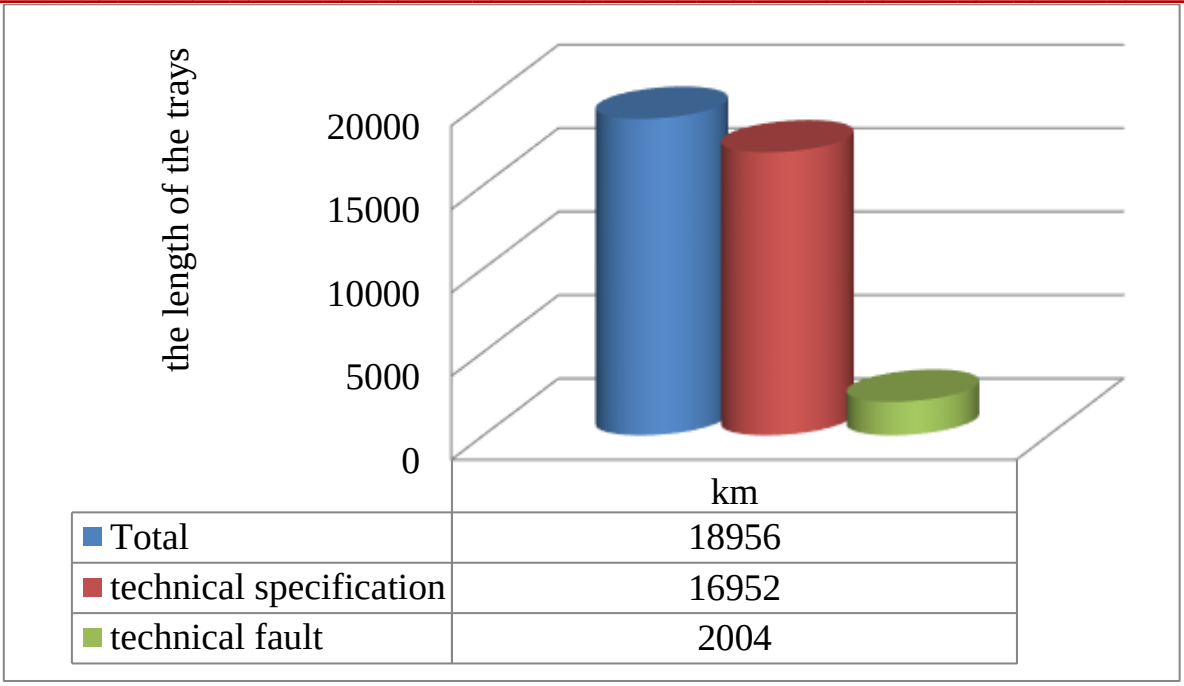


Figure 4. Technical condition of irrigation networks owned by water consumer associations, clusters and farms

In particular, in the sphere of water management of the republic there are 19.5 thousand km of irrigation canals, 11 percent of which (2131 km) are in an unusable condition (Fig. 3 and 4). As a result, water supply to more than 96.8 thousand hectares of irrigated land has deteriorated.

Of course, a number of works are being carried out to ensure technically reliable and safe operation of irrigation systems and hydraulic structures.

Directive documents of the Government on the systematic elimination of existing problems in the sphere were adopted. The forecast indicators for the construction and reconstruction of irrigation facilities for 2021-2023 have been confirmed (Fig. 5).

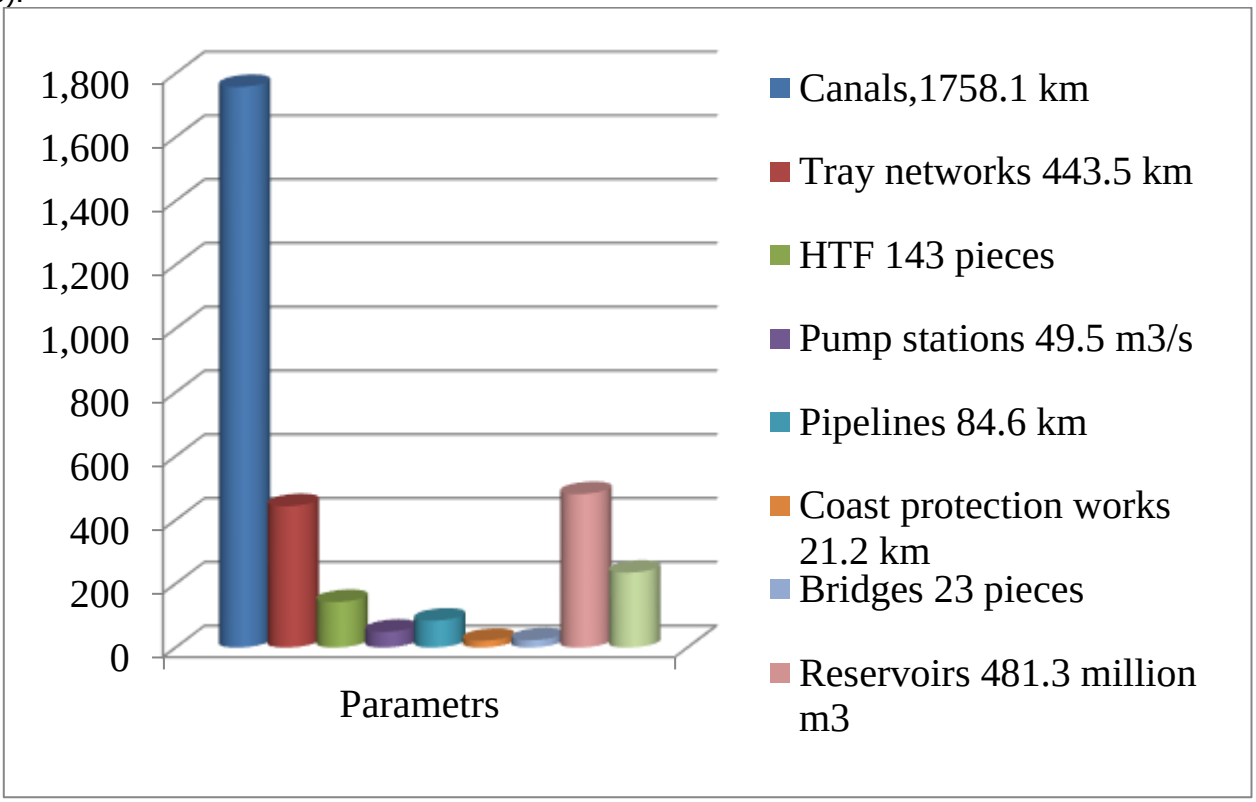


Figure 5. Water facilities to be built and reconstructed in 2021-2023

In 2021 alone, 5,495 km (101% of the plan) of inter-farm irrigation networks (canals) were cleaned and 5,848 (100%) hydraulic structures and 5,839 (100%) gauging stations were repaired [1].

In addition, 17,428 km (100 percent) of internal ditches and 68,076 km (100 percent) of ditches, 16,662 (102 percent) of hydraulic structures and 15,024 (102 percent) of Hydroposts have been completely renovated.

At the same time, one of the most urgent tasks of our time is the continuation of work on irrigation canals, including the efficient use of water resources in channel networks, the improvement of hydraulic calculations for the movement of water in channel networks, and the widespread introduction of innovative developments.

CONCLUSION:

According to the analysis of stock materials, 66 percent of the canals of the irrigation systems are earthen, and water losses due to filtration remain high. In addition, 77 percent of the canals of irrigation systems require repair and rehabilitation, and 20 percent - reconstruction.

The efficiency of the irrigation system and irrigation networks averages 0.63, and in some areas even lower, and irrigation networks lose 35-40 percent of the water taken from the main sources.

The main part of the existing flume networks has been in operation for more than 30 years, 70% of them require reconstruction and replacement.

REFERENCES:

1. Musaev Sh.M. "Hydraulic calculation of unstable water movement in irrigation trays made of composite materials / / Architectural and construction problems (scientific and technical journal), 2022, No. 2, pp. 197-199.
2. Makhmudov I., Kazakov E. "Hydraulic modeling of non-stationary water movement in the downstream of the Uchkurgan HPP" International journal for advanced research in science, engineering and technology, volume 20, p. 7, issue 6, June 2020, 14137-14140