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# “UMUMTEXNIKA FANLARINI O‘QITISHDA XORIJIY TAJRIBALARDAN FOYDALANISH”

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# MUNDARIJA

# THE IMPORTANCE OF EVAPORATION FROM THE RESERVOIR IN THE EXPERIENCE OF WORLD SCIENTISTS (2000-2020) AND THE ANALYSIS OF EVAPORATION PARAMETERS ON THE EXAMPLE OF THE CHORVOK RESERVOIR

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**Abstract**: Reservoirs are an important object for the agriculture and national economy of Uzbekistan. Evaporation from reservoirs is very important for our republic. This article examines the importance world scientists place on these topics and the annual variation of watershed parameters that affect evaporation.

**Key words:** Evaporation of water, water reservoirs, data, wind, absolute humidity, analysis

## Introduction

The area of irrigated fields in the Republic of Uzbekistan is 4.2 mln. ha. For water supply of those area needs 55-60 km3 of water resources. Only 20% of the water needs of different branches are covering by formulated water inside the country, and the 80% of needs water is formed in neighboring countries as Tajikistan, Turkmenistan, Afghanistan and Kyrgyzstan [1,2,3].

Therefore, construction of reservoirs on the territory of our republic, despite their negative consequences (flooding of large areas, loss of water to filtration, evaporation and sludge, low sewage discharge, lack of collocation due to insufficient sludge, the problem of supplying beneficial sediments to fields) is very important for agriculture [5,6].

At present, over 55 reservoirs in the country serve for seasonal regulation of

water resources. However, the issue of changing the usefulness of these reservoirs and the rapid and accurate assessment of the reservoir volume are still relevant. Proper distribution of irrigation water and accounting of any losses in the reservoirs are important [1,2].

Therefore, great attention is paid to the construction and modernization of these reservoirs, the creation of new modern methods for hydraulic calculations, which will allow them to identify and improve the factors that influence their efficient use, preventing wastewater, mudslides and their efficient use.

Currently, a number of scientists are studying the rational management of water resources in reservoirs, and determining the amount of water lost in reservoirs. Due to inefficient use of water in the reservoir, there is a growing risk of interruptions in the availability of irrigation water.

During the exploitation of the reservoir, a certain percentage of its useful volume is reduced as a result of wasting water. Therefore, water management calculations will be taken into account when calculating the expected water losses and, if possible, taking measures to reduce water losses. In order to study these issues, a mathematical model of them is created and calculated on the basis of this.

One of the issues of reservoir water management calculations is to determine the full size of the reservoir, taking into account expected water losses. It is important to limit the amount of water lost to freezing in reservoirs to regulate daily and weekly flow volumes (if the hottest period coincides with winter water shortages). Other types of wastewater in the reservoir have a low amount of water, so they should be ignored in the calculation of low water management [2,4].

In contrast, evaporation and transpiration losses in reservoirs for seasonal and perennial adjustment are the most important.

It has been projected that 5.3 billion people will live under water stress and water scarcity globally by 2030 (7). Most of the affected population relies on surface water—especially the water impounded by reservoirs, which can be easily accessed and managed (8). In

addition to supplying water for agricultural, municipal, and industrial uses, reservoirs can also be used for flood control and hydropower generation. From 1950 to 2007, the cumulative volume of water impounded by global reservoirs rose from about 1000 $km^3$ to 11,000 $km^3$, reducing the global sea level rise by 30 mm (9).

**Methodology and analyzing**

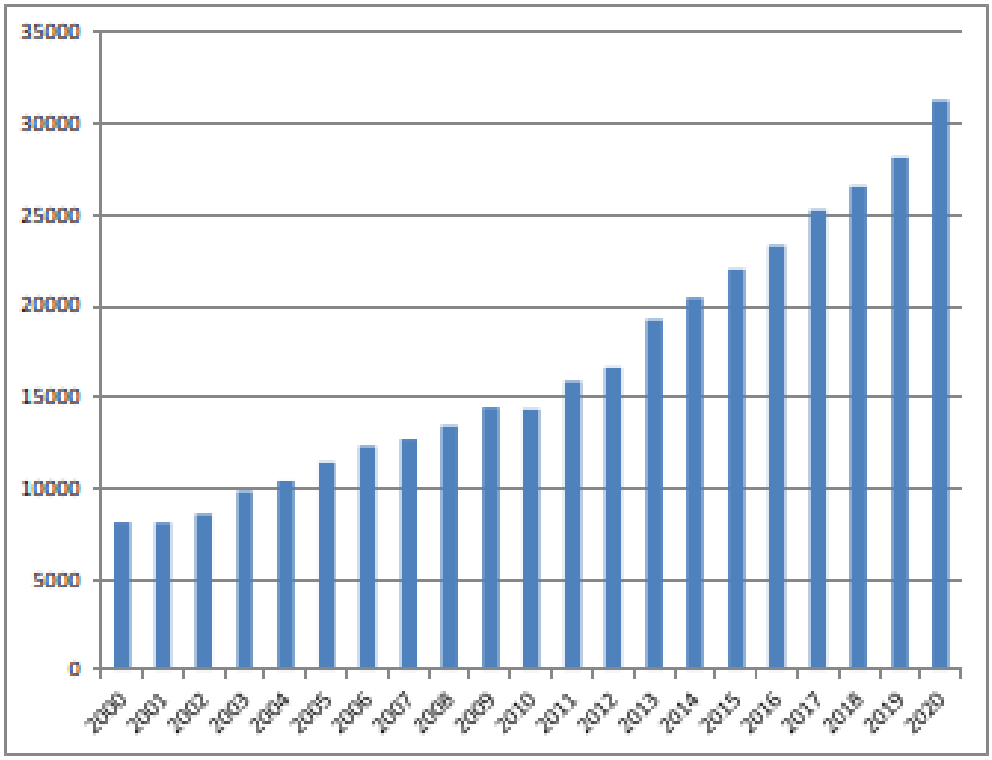


Fig 1 This is the number of papers published by scientists around the world on evaporation from 2000-2020.

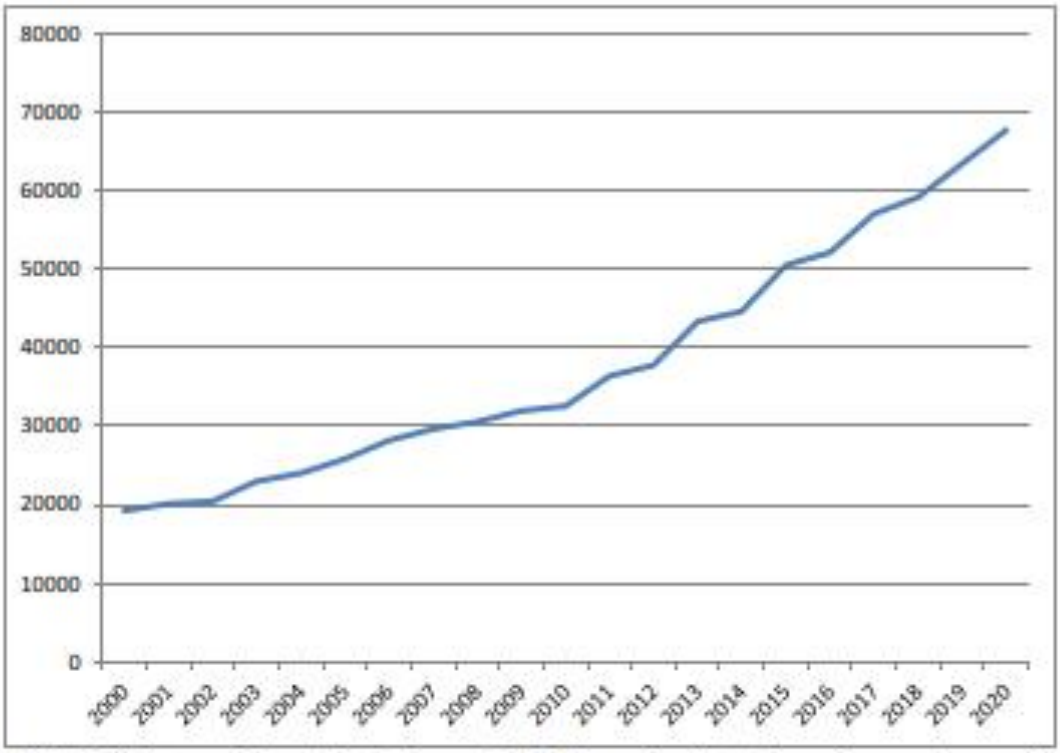


Fig 2 This is the number of articles published by scientists from all over the world on evaporation from reservoirs in 2000-2020

Fig 3 map of Charvak reservoir from google earth

Charvak is a water reservoir in Bo'stonliq District in the northern part of Tashkent Region, Uzbekistan, separating Ugam (north), Pskem (east), and Chatkal (south) ranges. The reservoir was created by erecting a 168 m (551 ft) high stone dam (Charvak Hydropower Station) on the river Chirchiq, a short distance downstream from the confluence of Pskem, Ko'ksuv and Chatkal rivers in the western Tian-

Shan mountains, which provide the main volume of water. Currently the confluence cannot be seen and all three rivers discharge directly into Charvak. The reservoir capacity is 2 $km^3$

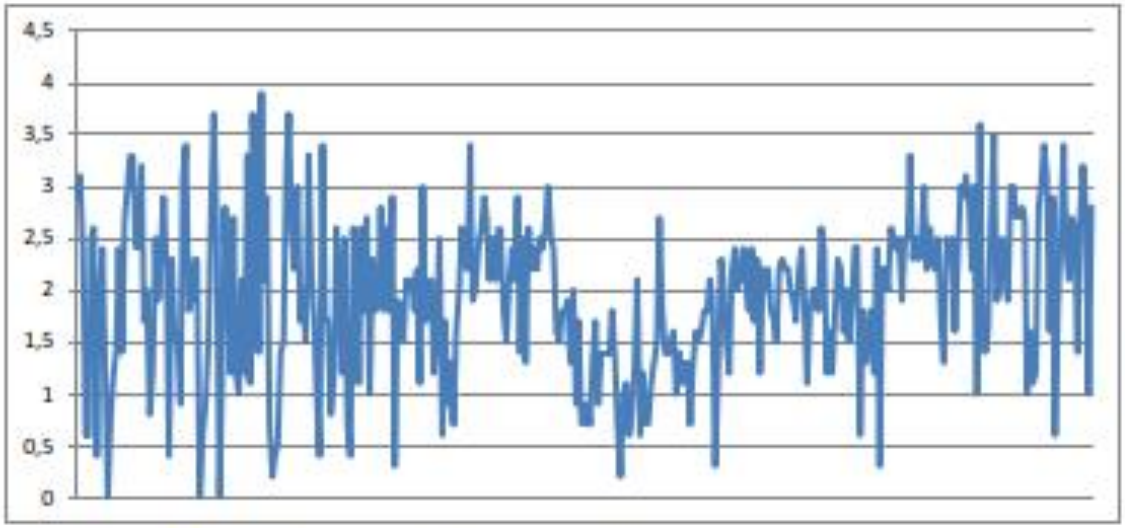


Fig 4 This is the wind in the reservoir (m/sec) and its annual change.

As you can see from this graph, we can know that the wind has not changed much since the beginning of the year. However these values can be taken from the evaporation, if practical work is carried out to reduce the wind by determining the direction of the wind.

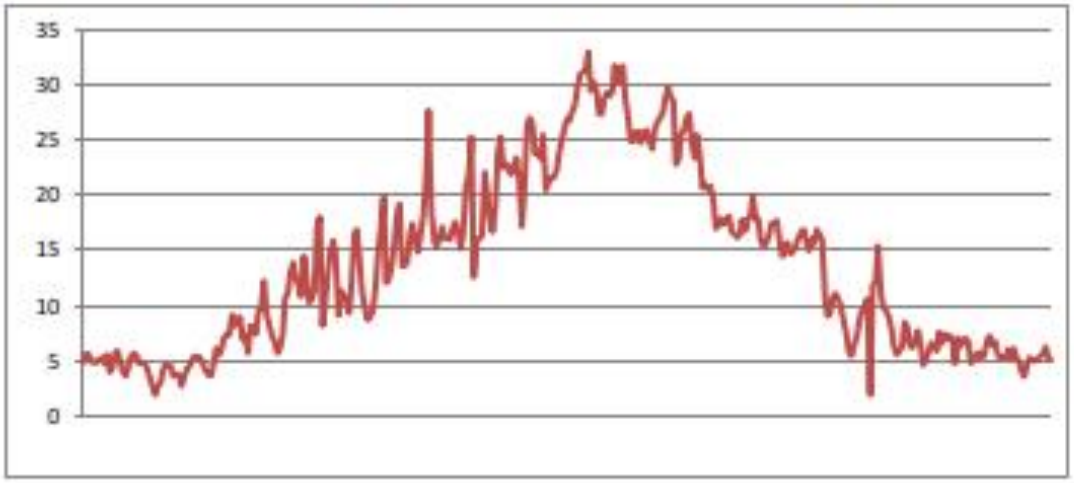


Fig 5 This is the absolute humidity (%) in the reservoir and its change throughout the year.

During the year, the humidity, unlike the wind, has had a large change, the largest amplitude has exceeded 30%.

## Conclusion

Reducing evaporation from water reservoirs will greatly improve the economy and agriculture of Uzbekistan. This can be achieved by reducing the factors that affect evaporation (radiation, wind, temperature, evaporation). Considering that every factor has special importance so we can make separate conclusions about each of them. Maximum accuracy is achieved if even small changes in factors are taken into account. In addition this, this is an important issue and that is why it is widely studied by scientists.

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