

Water Shortage Problems and Their Elimination on Measures

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Abstract

In the countries of Central Asia, including the Republic of Uzbekistan, the use of water resources, the economical use of this precious resource is one of the urgent problems of today. Correct use of clean drinking water, preventing water wastage in agriculture in the region is the only way to solve the above issues. This article covers the water shortage, the experiences of foreign countries on saving them, and the suggestions for introducing these experiences.

Keywords: rivers, water resources, water towers, global warming, melting glaciers, rational use of water, hydrometeorological situation analysis, artificial intelligence water treatment.

Introduction

Central Asia is one of the few regions in the world where water security is inextricably linked to energy, food and environment. A huge network of rivers flows into two main water basins - Amudarya and Syrdarya, which cross the entire region. During the Soviet era, the rich upstream countries provided water for irrigation to the downstream countries during the spring and summer months. In return, they were supplied with coal, oil and gas for heating and electricity during the winter months. In the early 1960s, agricultural mechanization began throughout the region, leading to intensive irrigation systems. Irrigated agriculture is prioritized to meet the needs of water-intensive cotton.

In Central Asia, more than 80 percent of water is used for growing agricultural products. A complex situation related to clean water can lead to food shortages in the region.

The concept of water security in Central Asia is a wide range of transboundary rivers that divide the region between upstream Kyrgyzstan, Tajikistan and downstream Uzbekistan, Kazakhstan, and Turkmenistan.

developed to manage the network.

With climate change, issues of water resource management and security are gaining importance in Central Asia. According to the information published by the UN on the occasion of the World Water Resources Day, today 2 billion people on our planet do not have direct access to clean drinking water.

According to experts' analysis, the global demand for water will grow by 55% in the period from 2000 to 2050. The report also mentions a 2017 study conducted by the UN Regional Center for Preventive Diplomacy in Central Asia and Adelphi University. Its main objective was to assess the economic benefits of large-scale cooperation in the field of water resources management. It turns out that if the countries of the region choose the path of cooperation, they can save at least 4.5 billion dollars a year.

"Issues of protection of water resources of SCO member states

is very relevant for In the vast territory of the organization, there are about 6 million rivers and lakes, an area of mountain ranges called "Water Towers".

is about 12.5 million square kilometers, the total volume of water resources is almost 10 million cubic kilometers. There are many glaciers that play an important role in natural processes and serve as a source of fresh water. At the same time, experts say that by the end of the 21st century, humanity may lose more than two-thirds of the Himalayan glaciers. A similar situation is occurring in the Pamir glaciers - the melting process of the world's largest continental glacier, called Fedchenko, with a length of more than 75 kilometers, is being observed, and it has become one of the greatest dangers of today.

As a result of global warming, the melting of the glaciers in Tianshan is accelerating." The largest part of the glaciers in the region fell on the territory of Tajikistan. At the online meeting of the UN General Assembly on Sustainable Development, the President of Tajikistan, Emomali Rahmon, stated that the melting of the country's glaciers poses a great threat to Central Asia.

"The rapid melting of the ice both on the surface of the water and on land can have disastrous consequences in the near future. A vivid example of this process is the rapid melting of glaciers in Tajikistan, which accounts for up to 60 percent of Central Asia's water resources," said the head of Tajikistan. He noted that thousands of small and medium-sized glaciers have completely melted in Tajikistan today. This situation has a negative impact not only within the republic, but also on other countries of the region. Huseyin Abrorov, a senior researcher on water issues at the Institute of Energy and Ecology of the Academy of Sciences of Tajikistan, points out that there is a high rate of water wastage in agriculture in the region.

"A negative aspect of the issue of water use is that waste, especially in our agriculture, is inevitable in the world is several times higher than the average water consumption. For example, we use 12-14 thousand cubic meters of water to cultivate one hectare of land. But, let's say, in Israel, they use only 5 thousand cubic meters of water per hectare, and the cotton yield reaches 50 centners. Our average yield is only around 22 centners. We need to learn the culture of rational use of water," he said.

How important is water resources for Uzbekistan?

Two circumstances aggravate the situation for Uzbekistan. Firstly, Uzbekistan's dependence on water supply from neighboring countries is high (80% of the consumed

water comes from abroad). Therefore, the problem of water shortage cannot be solved without agreement with these countries. Secondly, drinking water is used very inefficiently in Uzbekistan, especially in agriculture, which consumes 90% of the country's water resources. Water is lost both during delivery to consumers (35-40 percent of losses in irrigation systems due to outdated and decaying infrastructure) and during consumption (only 3 percent of irrigated lands have water-saving technologies). Even in Uzbekistan, climate change is affecting the main rivers in the region the supplier is causing the glaciers to melt on the mountain. The last 50-60 In 2010, the area of glaciers decreased by approximately 30 percent. According to estimates, glaciers may lose 50 percent of their volume if the average annual temperature rises by 2 degrees, and up to 78 percent if the temperature rises by 4 degrees. As a result, the volume of available water resources is also decreasing. For example, the annual volume of water used by Uzbekistan in recent years averages 51-53 cubic meters, which is 20% less than in the 80s of the last century. At the same time, the country's population grew 1.5-2 times during this period.

The impact of climate change on mountain glaciers is high because glaciers have their own mass balance. As you know, on hot summer days some of the ice on the mountain melts, and when winter comes, it accumulates again when snow falls on it. If the ice melts two meters and accumulates as much, this is a normal situation. But the melting of ice due to climate warming is forming more than it is accumulating and the glaciers are losing their mass. A special mark 6-7 meters long is placed on the ice. When we come next year, the glacier will be 3 meters below this mark. This means that the glacier has melted three meters and lost a corresponding amount of mass. Unfortunately, it is known that a glacier with a plus balance has not yet been observed. This is a sign that our glaciers in our mountains are continuously melting.

Analysis of the hydrometeorological situation and preliminary assessment results of water consumption in most rivers of the Amudarya and Syrdarya basins in 2021 shows a significant decrease compared to the norm. Can emerging AI technologies solve Central Asia's water crisis?

Artificial intelligence is the future of the water industry. AI (artificial intelligence) technologies are critical to making today's water infrastructure more resilient and more profitable can earn. Analysts artificial intelligence community to purify water emphasizes that it brings the characteristics that are used in other areas of life. AI-enabled online platforms can offer a transformed, engaging and open way for consumers to view real-time water consumption, pay bills and learn about dynamic water resource conditions. In recent years, countries without water their agriculture is developing its infrastructure, looking for ways to use water wisely. For example, Israel is one of the best examples in this regard and is the driest country in the Middle East. Israel has a private water management company. In particular, the high-tech company

Mekorot supplies 90 percent of Israel's drinking water and manages about 80 percent of the water supply. Its subsidiary, EMS Mekorot Projects, provides solutions for waterworks planning, installation, testing, wastewater treatment, desalination, rainwater harvesting and more. Mekorot's second subsidiary, Mekorot Development and Enterprise, organizes design, feasibility studies, project management, construction, operation and maintenance of treatment plants.

A question arises here. Are there water management companies or scientific research being conducted in any of the Central Asian countries where water scarcity is high and likely to increase to the level of life and death in the near future? Of course, paying attention to this is one of the urgent issues of today.

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