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Research Article

CONDITION, PROBLEMS AND SOLUTIONS OF MONITORING THE UNDERGROUND WATER OF UZBEKISTAN

***I.A. Agzamova and G.E. Ochilov**
Tashkent State Technical University, 100095 Tashkent, Universitet Street 2, Uzbekistan,
**Author for Correspondence*

ABSTRACT
The article provides an overview, current state and problems of groundwater resources of Uzbekistan, as well as the problems of intensive technogenic impact on groundwater, which to some extent have already led to pollution of groundwater.

INTRODUCTION
Modern natural, ecological, economic, social conditions require the improvement of water legislation throughout the world, including in one of the most water-poor countries like Uzbekistan. According to the Institute of World Resources, the world's most unsecured countries were 13 countries, including four republics of the former USSR - Turkmenistan (206 m3 / year per person), Moldova (236 m3), Uzbekistan (625 m3) and Azerbaijan (972 m3). As a result of the reduction of farmland for water-intensive crops, the failure of water intake facilities, the economic difficulties of enterprises, the lack of electricity and the rise in price of electricity, the water intake throughout the country decreased from 28.9 to 14.9 million m3 / day, compared to the 80s, that is, almost doubled. Drinking water supply in cities is 80% at the expense of groundwater, in district centers this figure is 50%, and in rural areas 20%. In this regard, the protection of groundwater from pollution is of great importance. To this end, some areas of the formation of fresh groundwater fields have been given the status of "Protected Natural Territories".

It should be emphasized that the Water code of the Republic of Uzbekistan existed in the past (Water code of the Uzbek SSR, 1983). The Lack of concepts and terms in it was filled in an article 21 was added to the Law "on water and water use", adopted on 6.05.1993.

The Republic of Uzbekistan is among the most densely populated republics of the former Union. On the area of 447.7 thousand km^2, of which 35% are mountains and bushes, 30 million people live. More than 40% of the population is concentrated in 110 cities and 93 urban-type settlements, about 60% are rural population. The industry is represented by more than 1,800 production associations, enterprises and industries in more than 100 branches. 332 thousand km^2 of land is in agricultural use. About 10% of the river flow is formed within the republic, 90% or 89 km^3 comes from adjacent territories. The total water consumption in the republic is 62-65 km^3. From this volume 25 km^3 is taken from the river. Amudarya and 11 km3 - from the Sirdarya. The rest falls on small rivers and underground water sources. For the needs of agriculture, 85% of the water consumed is used. The total selection of groundwater for economic purposes reached 3.43 km3, technical water supply - 0.74 km3, irrigation - 3.2 km3, drainage - 2.5 km3. 84% of the urban population and only 52% of the rural population are covered by centralized water supply.

MATERIALS AND METHODS
Irrational use of land, mineral and water resources led to the development of trends in environmental degradation, manifested B pollution of the air basin, surface watercourses, vegetation, soil of rocks and groundwater, the development of hazardous geological processes.

Uneven distribution of water consumers - industrial, agricultural and other objects - leads in certain areas of the fields to a progressive shortage of groundwater reserves against the background of their pollution caused by man-made processes. Pollution and depletion of groundwater are the main negative consequences of the anthropogenic impact on the hydrogeological environment.

In order to keep regular records of changes in the technogenic and ecological situation in the protected areas, A state cadastre of protected natural areas –zones of formation of fresh groundwater deposits-was created, as well as regular records of changes in the assessment of the state of operational reserves, forecast resources, their regime and quantity, water intake facilities, water users, land owners and land users, sources of pollution to identify technogenic factors negatively affecting protected natural areas.

In order to preserve groundwater resources, their rational use and prevent depletion, along with the measures taken by the government of the Republic, it is necessary to:

1. Develop and implement measures to reduce and regulate discharges of collector-drainage and other wastewater (municipal and industrial) into surface streams, which are the main source of groundwater supply.
2. To limit, and sometimes prohibit, the location of industrial and agricultural facilities, the redistribution of water resources within protected natural areas and large deposits of fresh groundwater.
3. Gradually reduce the use of fresh groundwater for various needs of industry and agriculture, to replace them with weakly mineralized, especially in irrigated areas with high groundwater levels, where vertical drainage along with reclamation effect will replenish irrigation water resources.
4. Gradually reduce water consumption rates, bringing them closer to international.

Constantly intensifying human activities can not affect the environment. Inevitable industrial waste, the consequences of the use of chemicals in agriculture, and others do not give hope for the absolute preservation of the quality of groundwater. Considering this, the planned technological impact on groundwater should be regulated by limits that ensure only permissible changes in their qualitative characteristics. In principle, it is advisable to extend this thesis to all other studied components of the natural, including and the geological environment.

RESULTS AND DISCUSSION

The industries that most intensively affect the geological environment and groundwater, in particular, include mining and processing of minerals. The goal set by the country - the achievement of economic independence - was the cause of a powerful impetus to the development of this industry. Currently, large deposits of gold and non-ferrous metals, oil and gas, coal and other minerals are being developed in Uzbekistan, existing and new processing plants are being built.

From the point of view of geology, the polluted area is mainly represented by angry quaternary age cones, and as the distance from the mountains decreases, the size of boulder-pebble sediments decreases, then they replace: sand and pebble and loamy-sandy-sandy loamy rocks. If in the head part of the debris cone, groundwater is deposited at a depth of more than 30 m and has a flow rate of more than 10 m / day, then in the peripheral part it is up to 1 m, in some places they even protrude to the surface, and the flow rate on the groundwater table decreases to 01 m / day Water from the groundwater table cannot fall down, and pollution builds up at the top. The existing collector-drainage network removes this pollution along with drainage from fields in Sirdarya to prevent further development of the identified regional pollution of groundwater with oil products and the development of specific environmental measures, it is necessary:

1. to conduct a survey of all objects using oil and oil products to establish an anti-filtration coating, embankment around tanks, storm sewers. These structures exclude the possibility of filtration of petroleum products into groundwater.

2. For all existing and mothballed oil fields, refineries and petroleum bases, investigate the process of groundwater pollution, estimate leak volumes.

3. Expand the groundwater monitoring network by observation wells in areas of oil pollution.

When placing large objects justify the site with hydrogeological positions. The most urgent task of hydrogeologists today is the study and assessment of the ecological state of the components of the geological environment in order to preserve the drinking quality of groundwater for future generations and their rational use.

In 2003, with the introduction of GIS technologies in hydrogeology began a new period of application of computer technology. There are opportunities to build various hydrogeological maps and sections, create a database, as well as through the introduction of software systems in hydrogeology ArGIS and MODFLJW there are opportunities to automate the virtualization of modeling of hydrogeological processes with reference to databases. With the use of GIS technologies conducted AIS GVK "Underground water", creates a hydrogeological and information basis of hydrogeological facilities, modeled groundwater deposits of the Fergana valley, Tashkent region.

CONCLUSION

The modern scientific, personnel and technical base of hydrogeologists of the republic allows to hope for the solution of the most complex tasks at the highest level. The use of geo-information technologies, modern software products, automatic measuring instruments, high-resolution satellite imagery, mathematical modeling methods reveals new research horizons for hydrogeologists and an engineer-geologist in solving problems of sustainable management of groundwater resources.

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