

PROBLEMS OF THE ARAL RIVER AND METHODS OF IMPROVEMENT OF WATER ECOLOGICAL RESOURCES OF UZBEKISTAN

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Abstract:

The Aral Sea basin is a region of increased attention of the world community and an arena of international cooperation in resolving the Aral crisis. The environmental situation in the region, associated with the drying up of the Aral Sea, is a problem of international importance, and its preservation and sustainable development are of paramount importance both at the global and regional levels.

Keywords: Aral problems, ecology, Environmental Protection.

Introduction

In 2021, the President of Uzbekistan Sh.M. Mirziyoyev signed the Resolution "On measures to implement the special resolution of the UN General Assembly of May 18, 2021 "On declaring the Aral Sea region a zone of environmental innovation and technology" dated July 29, 2021 No. 5202. Together with the Global Green Growth Institute, an Investment Project for the Green Rehabilitation of the Territories of the Republic of Karakalpakstan is being implemented to eliminate the consequences of the Aral Sea crisis (2021-2024). During the implementation of the project, the complex problems of the Aral Sea will be solved at the systemic level, which will allow reorienting the development trajectory of Karakalpakstan to a green growth model, as well as taking specific measures to restore the livelihoods of the population, increasing its resilience to environmental disasters and the ability to generate sustainable business. To this end, measures are being taken to adapt and ensure the livelihoods of 113 thousand people in the most affected areas, 1,587 farmers and entrepreneurs will receive agribusiness models, 500 farms will be created, micro, small and medium enterprises.

The project "Conservation and sustainable use of wetland, lake and floodplain ecosystems of the Aral Sea region" is aimed at supporting the newly created 5 protected natural areas on an



area of more than 2 million 400 thousand hectares in the Republic of Karakalpakstan, and thereby ensuring the territorial form of protection of all types of fauna and flora.

Finally, together with UNDP, in 2020 the crowdfunding initiative "Green Aral - Green Aral Sea" was launched to green the bottom of the Aral Sea. A Memorandum of Understanding was signed between the UN Development Program and a number of ministries and departments of the republic. As part of this initiative, more than 34 thousand seedlings were planted on the dried-up bottom of the Aral Sea.

In recent years, there has been an increase in social development and well-being of the population of Uzbekistan. The country's population and economy have grown significantly, which is becoming the main factor in socio-economic and environmental changes. In particular, the population of the republic increases by an average of 650-700 thousand people per year; by 2030, the population is expected to increase to 39 million people. The population's need for access to high-quality and reliable water, energy and other natural resources is growing.

At the same time, the economy is experiencing significant growth, an increase in the production of goods and services, an increase in the income of the population and a contribution to regional and global development. In 2022, the gross domestic product (GDP) of Uzbekistan in current prices amounted to 888.3417 trillion soums, an increase of 5.7% compared to 2021. The European Bank for Reconstruction and Development (EBRD) forecasts GDP growth in 2023 by 6.5%, and the Central Bank of Uzbekistan - by 4.5-5% (Table 1).

Table 1. Dynamics of GDP growth in Uzbekistan (2013-2022)

Годы	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Рост ВВП (%)	7,3	6,9	7,2	5,9	4,4	5,5	6,0	2,0	7,4	5,7

The driving forces of environmental change are mainly associated with the development of industry, agriculture and construction without taking into account the available potential of natural resources, accompanied by irrational use of natural resources, low level of scientific developments and implementation of the results of scientific research in the field of ecology and environmental protection.

Population growth and its concentration in cities place significant demands on the environment and natural resources. The share of the urban population was 50.9%, rural - 49.1% (2022). The dynamics of the permanent population and growth rates over the past five years are shown in Table 6. As of January 1, 2023, the country's population density was 80.2 people per square kilometer. This is 1.6 people more than in the same period in 2021 (78.6 people per square kilometer in 2022). The lowest rates were recorded in the Navoi region - 9.5 and the Republic of Karakalpakstan - 11.9 people per square kilometer.

Structure of production and consumption. The leading industries of the country are cotton processing, mechanical engineering, textile, gas, electrical engineering, radio electronics,



instrument making, oil refining, automobile, as well as non-ferrous metallurgy, processing of agricultural products. The chemical and petrochemical industries, light industry, electric power industry, ferrous metallurgy, building materials industry, etc. are also actively developing. According to statistics for 2022, Uzbekistan ranks 14th in the world in natural gas production, third in export and sixth in cotton production, seventh in uranium production (4% of the world's uranium reserves), fourth in gold mining in the world. In general, the country has seen growth in the manufacturing industry, the share of which in GDP increased from 21.1 to 26.7% between 2017 and 2022 (Statistics Agency, 2022 and 2023). Due to the rapid development of energy capacities, industrial production and public utilities, the danger of air pollution increases every year. Air pollution is aggravated by constantly increasing emissions from motor vehicles (about 80% of all emissions into the atmosphere of large cities come from mobile sources).

Currently, there are about 70 reservoirs in the republic, the water from which is used mainly for irrigation. The largest reservoirs in Uzbekistan are used in a comprehensive manner and mainly for irrigation, energy and industry. Over a ten-year period, there has been a decrease in the volume of water withdrawal due to a decrease in its availability due to climate change. At the same time, in recent years, the system and culture of water use have improved, which allows for the rational use of water resources and the minimization of discharges from irrigated fields into drainage systems. This allows overcoming water shortages even in low-water years. In addition, drought-resistant and early varieties of agricultural crops are increasingly used in agricultural production. The largest areas of land (about 60%) are classified as agricultural land. Agricultural land, unlike other categories of land, serves as the main means of producing food, animal feed and raw materials for various industries. Compared to 2012, given the growth in population and the need to ensure food security, the area of agricultural land has increased. At the same time, the area of forest resources and lands for nature conservation purposes also increased during the period under review. In general, there is a reduction in the area of irrigated land in Uzbekistan, which is associated with a lack of water resources and deterioration of the ecological and meliorative state of lands. Uzbekistan is making efforts to eliminate the demographic and other negative impacts of economic development on natural resources. This section provides an overview of measures aimed at various sectors of the economy, such as agriculture, energy and industry. In 2019, the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030 was approved, which covers strategic priorities in terms of ensuring food security for the population, developing the agro-industrial complex and management based on the rational use of natural resources and environmental protection (Decree of the President of the Republic of Uzbekistan dated October 23, 2019 No. UP-5853). The country is implementing systemic measures to ensure the rational use of water resources, the widespread introduction of water-saving technologies in crop production and their state support, as well as improving the reclamation state of irrigated lands in accordance with the Concept of the efficient use of land and water resources in agriculture (Decree of the President of the Republic of Uzbekistan dated 17.06.2019 No. UP5742). The area covered by water-saving technologies is about 25% of irrigated areas.



For the current years, the Development Strategy of New Uzbekistan for 2022-2026 (Decree of the President of the Republic of Uzbekistan dated 01/28/2022 No. UP-60) identifies priorities (goal 31), which focus on the implementation of the state program to reform the water management and water conservation system, increase the efficiency of water use, and reduce electricity consumption at water management facilities. In the Strategy for Water Resources Management and Development of the Irrigation Sector in the Republic of Uzbekistan for 2021-2023 (Resolution of the President of the Republic of Uzbekistan dated 02/24/2021 No. PP5005), in measures to develop the social and industrial infrastructure of the Republic of Uzbekistan in 2022 - 2024. (Resolution of the President of the Republic of Uzbekistan dated 22.01.2022 No. PP-98) also pays attention to the analysis of the efficiency and effectiveness of irrigation and melioration projects, requests proposals for equipping irrigation and melioration facilities with automated equipment for measuring and monitoring water and electricity consumption. A Roadmap has been adopted for the consistent implementation of the set tasks and ensuring the achievement of the main target indicators defined in the Concept of Water Resources Development for 2020-2030 (Decree of the President of the Republic of Uzbekistan dated 10.07.2020 No. UP-6024). Measures are being implemented to further improve the introduction of water-saving technologies in agriculture" (Resolution of the President of the Republic of Uzbekistan dated 01.03.2022 No. PP-144). This resolution presents priorities for increasing the efficiency of water use through the use of water-saving technologies, including drip irrigation, sprinkling and others, and establishes the procedure for state support for the introduction of water-saving technologies. In recent years, the country has paid much attention to the introduction of resource-saving technologies in the energy sector. It should be noted that the measures to accelerate the development and ensure financial sustainability of the electric power industry (Resolution of the President of the Republic of Uzbekistan dated October 23, 2018 No. PP-3981, providing for the implementation of the "Roadmap" for 2018-2022 and the Resolution of the President of the Republic of Uzbekistan "On accelerated measures to improve the energy efficiency of economic and social sectors, the introduction of energy-saving technologies and the development of renewable energy sources" (Resolution of the President of the Republic of Uzbekistan dated August 22, 2019 No. PP-4422) are in place. This resolution gives priority to renewable energy, mainly generated by hydroelectric power plants, which currently account for only 10-14% of the total electricity generation in the country. Despite the enormous potential of solar and wind energy, it is not fully utilized. In this regard, it is noted that additional decrees provide for benefits and preferences in the field of renewable energy sources, in including specific tax incentives and credits for solar panel installations. The following chapters of the report provide additional examples of responses to specific environmental issues related to air, water, soil, land, biodiversity and other elements of the environment.

In recent decades, Uzbekistan has seen an intensification of industrial production, agriculture and transport. Significant economic development and growth in production have also led to an increase in demand for electricity. This activity, combined with the influence of such natural



features as a dry, arid climate, sandy loam and loamy soils, causes changes in the state of the atmospheric air.

Considering emissions into the atmospheric air, one can note a large number of substances that are harmful in their composition, such as dust and its fine fractions, sulfur dioxide, nitrogen oxide and dioxide, carbon monoxide, which in many countries are called classic pollutants. In addition to them, individual industries and transport emit so-called specific pollutants into the atmospheric air, such as formaldehyde, heavy metals, benz(a)pyrene.

The indicator "pollutant emissions" consists of two components: emissions from stationary sources and emissions from mobile sources. Emissions of pollutants from stationary sources are characterized as the total amount of pollutants entering the atmosphere from all organized and unorganized stationary sources. Analysis of official statistical reporting for Uzbekistan allowed us to identify the main industries polluting the atmosphere: energy, oil and gas industry, metallurgy, chemical industry, construction industry. The main emissions of pollutants from mobile sources are determined based on the volumes of fuel and lubricants (motor gasoline and diesel fuel) consumed by personal and commercial vehicles. The main factors of these emissions are the quality of the fuel used, insufficient use of public transport by the population, driving their own car, as well as insufficient attention of car owners to the technical parameters of their car. Uzbekistan is located in the arid zone of Central Asia with an arid climate, long dry and hot summers, humid springs and unstable winters. The territory of the republic is characterized by unfavorable climatic conditions for the dispersion of pollutants in the atmosphere (calm, inversion ...). Long periods without precipitation, weak winds, temperature inversions contribute to stagnation of atmospheric air and create conditions for the accumulation of pollutants. The combination of meteorological conditions and anthropogenic load leads to high levels of air pollution in cities. The location of large cities with high population density, traffic flows, environmentally unsafe industries in narrow intermountain basins against the background of specific natural and climatic conditions (frequent inversions, stagnant phenomena in the atmosphere) contribute to the accumulation of pollutants in the surface layer of the atmosphere.

REFERENCES

1. Jobborov, B., Madrahimova, Z., Jo'rayev, H., & Akramov, A. (2024). Xozirgi zamonning ekologik muammolari (sanoat tarmoqlari misolida). Евразийский журнал технологий и инноваций, 2(2), 65-69.
2. Nurmatovna, M. Z., & Ilashovich, K. B. (2023). Under the current climate change and ecological situation, efficient use of water resources of Surkhandarya region. British Journal of Global Ecology and Sustainable Development, 23, 33-38.
3. Madrakhimova, Z. N., qizi Ergasheva, S. S., & kizi Omonbaeva, M. Y. (2023). Classification Of Modern Ecological Problems and Principles of Forming Ecological Competence in Students. Web of Technology: Multidimensional Research Journal, 1(6), 46-52.
4. Rasulov, I., & Madrakhimova, Z. (2023). " Ecology and environment" is the basis of human health. Science and innovation, 2(D4), 59-62.

