



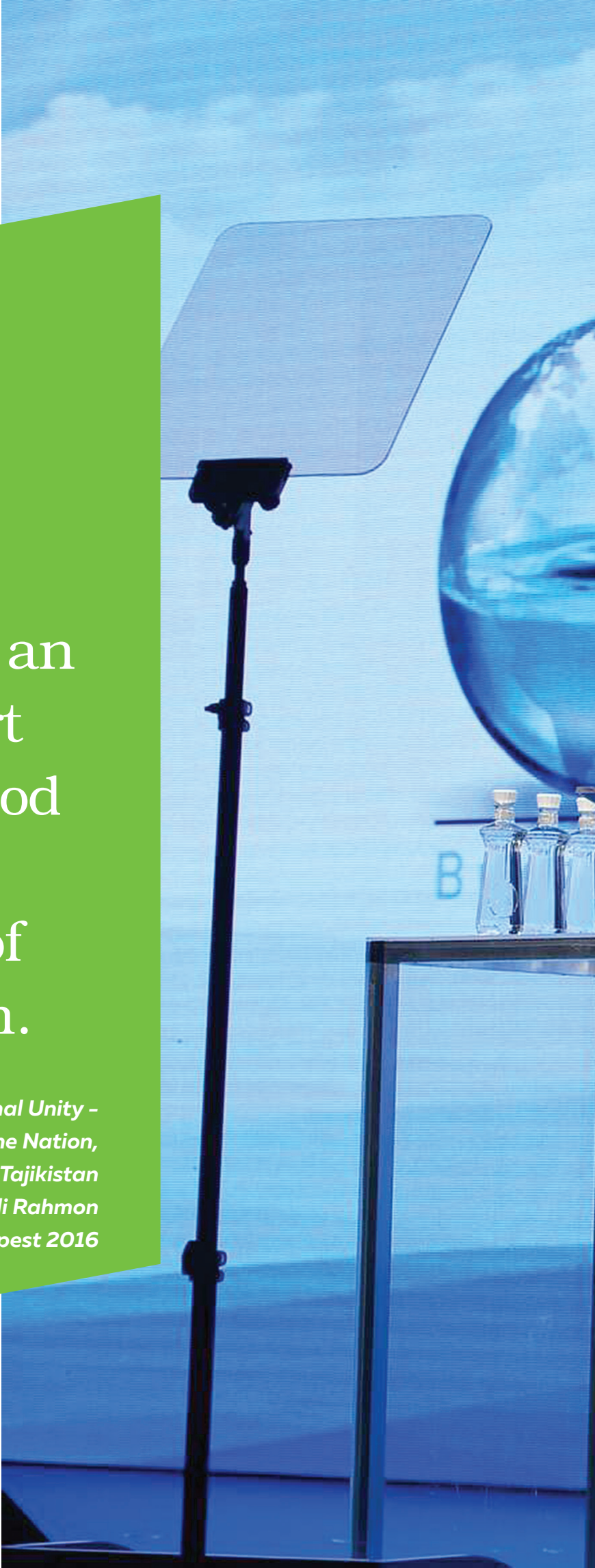
Agency for Land Reclamation and Irrigation
under the Government of the Republic of Tajikistan

Tajikistan National Commission
on Irrigation and Drainage



IRRIGATION AND DRAINAGE IN THE REPUBLIC OF TAJIKISTAN

Dedicated to the 14th International
Drainage Workshop on the topic:
Modernization of irrigation
and drainage systems in order to adapt
to climate change and sustainable development
Dushanbe, Tajikistan, 2024

A blue-tinted photograph of a laboratory setting. In the foreground, a black stand holds a clear glass plate. To the right, a large glass globe is partially visible. Below the globe, a glass tray holds several small glass vials. The background shows a window with a view of a blue sky and a body of water.

Irrigated
agriculture is an
important part
of ensuring food
security and
employment of
the population.

*Founder of Peace and National Unity -
Leader of the Nation,
President of the Republic of Tajikistan
Emomali Rahmon
Water Summit, Budapest 2016*



BUDAPEST-2016

WATER

SUMMIT

lálkozó



BUDAPEST-2016
WATER
SUMMIT
BUDAPESTI VÍZ-VILÁGTALÁLKOZÁS

Global Water Initiatives of the Republic of Tajikistan

From the early years of independence, the Republic of Tajikistan embarked on implementing water cooperation diplomacy to facilitate the resolution of global water and environmental issues.

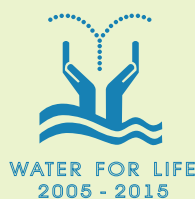
During this period, at the initiative of the President of the Republic of Tajikistan, the Leader of the Nation, the esteemed Emomali Rahmon, the United Nations General Assembly adopted seven resolutions aimed at addressing water-related issues, including the following:



— The declaration of the year 2003 as the International Year of Freshwater (UN General Assembly Resolution of December 20, 2000, 55/196):

In September 2000, at the United Nations Millennium Summit, world leaders committed to halving the proportion of people without access to safe drinking water by 2015. Additionally, at the 2002 World Summit on Sustainable Development in Johannesburg, a goal was set to halve the proportion of people without access to proper sanitation by 2015.

The International Year of Freshwater was intended to mobilize the world to achieve these goals by increasing awareness of the issue and developing new ideas and strategies for its resolution. In this regard, the United Nations planned a series of events, with one of the central events being the International Freshwater Forum (August 29 - September 1, 2003), in Dushanbe, where discussions and initiatives related to freshwater issues took place.



— The declaration of the years 2005-2015 as the International Decade for Action “Water for Life” was made through the United Nations General Assembly Resolution on December 23, 2003 (58/217, 58th session).

This Decade aimed to promote efforts and actions at the international, regional, and national levels to address water-related issues and ensure sustainable access to clean water for all.

The primary goal of the Decade was to support efforts to achieve international commitments related to water resources and water-related issues by 2015.

These commitments also included the development goals outlined in the United Nations Millennium Declaration, particularly the target to halve the proportion of people without access to safe drinking water and basic sanitation.

Another important goal of the Decade was to develop integrated water resource management plans by 2015, and enhance water use efficiency, when providing assistance to developing countries.



— The declaration of the year 2013 as the International Year of Water Cooperation was made through the United Nations General Assembly Resolution on December 20, 2010

(65/154, 65th session).

Taking into account the growing water-related issues, and recognizing cooperation as a key factor in addressing them, the United Nations General Assembly, at the initiative of the Republic of Tajikistan, adopted Resolution 65/154 on December 20, 2010, by consensus, declaring the year 2013 as the International Year of Water Cooperation.

Cooperation in the field of water resources plays a crucial role in ensuring security, reducing poverty, achieving social justice, and promoting gender equality. Water cooperation is economically beneficial and a key factor in the conservation of water resources and the protection of the environment.

The actions of the country on a global level regarding water resources are characterized by their efforts to draw more attention from the global community towards solving water-related issues and enhancing water cooperation.



— The declaration of the years 2018-2028 as the International Decade for Action “Water for Sustainable Development” was made through the United Nations General Assembly Resolution on December 21, 2016 (71/222, 71st session).

To accelerate efforts in addressing water-related issues, the United Nations General Assembly declared 2018-2028 the International Decade for Action “Water for Sustainable Development.”

The goals of the Decade are to focus attention on sustainable development and integrated water resource management, aiming to achieve social, economic, and environmental objectives. It also emphasizes the implementation and promotion of relevant programs and projects and the facilitation of cooperation and partnerships at all levels to support the achievement of internationally agreed water-related goals, including those outlined in the Sustainable Development Agenda for 2030.

The Decade highlights the importance of promoting efficient water use at all levels, considering the interlinkages between water, food, energy, and the environment. Additionally, it underscores the importance of the participation and comprehensive involvement of all relevant stakeholders, including women, children, youth, elderly individuals, persons with disabilities, indigenous peoples, and local communities.

The United Nations General Assembly, during its 77th session, unanimously adopted a resolution declaring the year 2025 as the International Year of Glacier Conservation. This resolution was proposed by Tajikistan.

The initiative of proposing this resolution belongs to the President of the country, Emomali Rahmon. The document not only declares the International Year but also designates an International Day for Glacier Protection, to be on March 21. The resolution was supported by 153 member states of the United Nations.

Emomali Rahmon also proposed the creation of a trust fund within the United Nations to support glacier conservation efforts and the organization of an international conference in 2025 dedicated to this theme, to be held in Dushanbe.

The resolution underscores that glaciers are a crucial component of the hydrological cycle. Their accelerated melting “has serious implications for climate, the environment, human health, and sustainable development.”

Earlier, Emomali Rahmon stated that over a thousand glaciers in Tajikistan have already melted due to global warming. Glaciers cover 8% of the country’s territory. This highlights the significant impact of climate change on Tajikistan’s glaciers and the urgent need for conservation efforts.

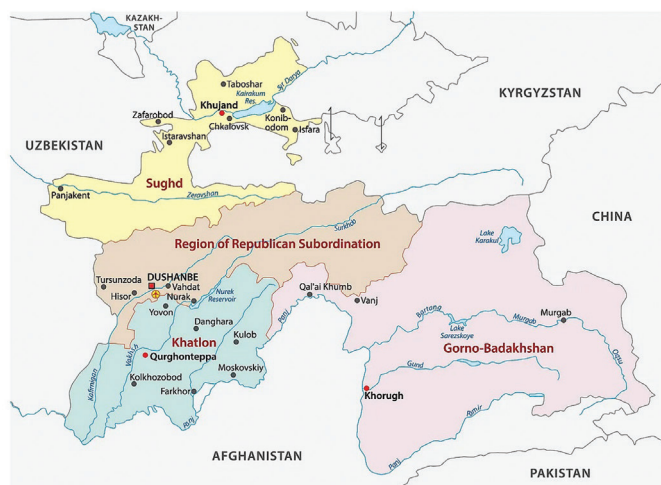


General Information about Tajikistan

The Republic of Tajikistan is located in the southeast of Central Asia in the basin of the Aral Sea and does not have access to the sea. The country's territory covers 142,326 km². Its state border stretches from west to east for 700 km and from north to south for 350 km. It shares its western and northern borders with the Republics of Uzbekistan (approximately 1,332.9 km) and Kyrgyzstan (approximately 987 km), to the south with Afghanistan (approximately 1,344.15 km), and to the east with China (approximately 494.95 km).

According to its administrative division, the Republic of Tajikistan consists of the capital city Dushanbe, the Gorno-Badakhshan Autonomous Region (GBAO), the Sughd Region, the Khatlon Region, and the Districts of Republican Subordination (DRS).

Tajikistan is a mountainous country with elevations ranging from 300 to 7,495 m above sea level. Approximately 93% of its territory is covered by mountains, which includes some of the world's highest mountain systems. In the North lies the



Fergana Valley, while in the Northwest and central parts, there are the Turkestan, Zeravshan, Gissar, and Alai Mountain ranges. In the Southeast are the Pamir Mountains, which includes Mount Somoni, which stands at 7,495 m. The Southwestern part of the country consists of lowlands, including the Vakhsh and Gissar valleys.

Tajikistan has a continental climate and is located in the northernmost part of the subtropical zone. The climate in the country is characterized by sunshine, dry air, and low cloud cover. Air temperatures exhibit significant daily and seasonal fluctuations. The complexity of the terrain and the variety of elevations contribute to significant climatic differences between different regions.

In the mountains of Tajikistan, depending on the elevation, the climate can be moderately warm, temperate, or cold. In the valleys and foothill plains, the average temperature in July ranges from +23 to +30 degrees Celsius, while in January, it varies from -1 to +3 degrees Celsius. Annual precipitation in these areas typically ranges from 150 to 300 mm.

As of January 1, 2023, the population of the country was approximately 10.08 million people. Tajikistan is home to representatives of many nations and ethnicities. More than 70% of the country's population resides in rural areas. The population growth rate in the country averages about 2.2% per year. The official language is Tajik (Farsi with Cyrillic script), and the interethnic communication language is Russian.

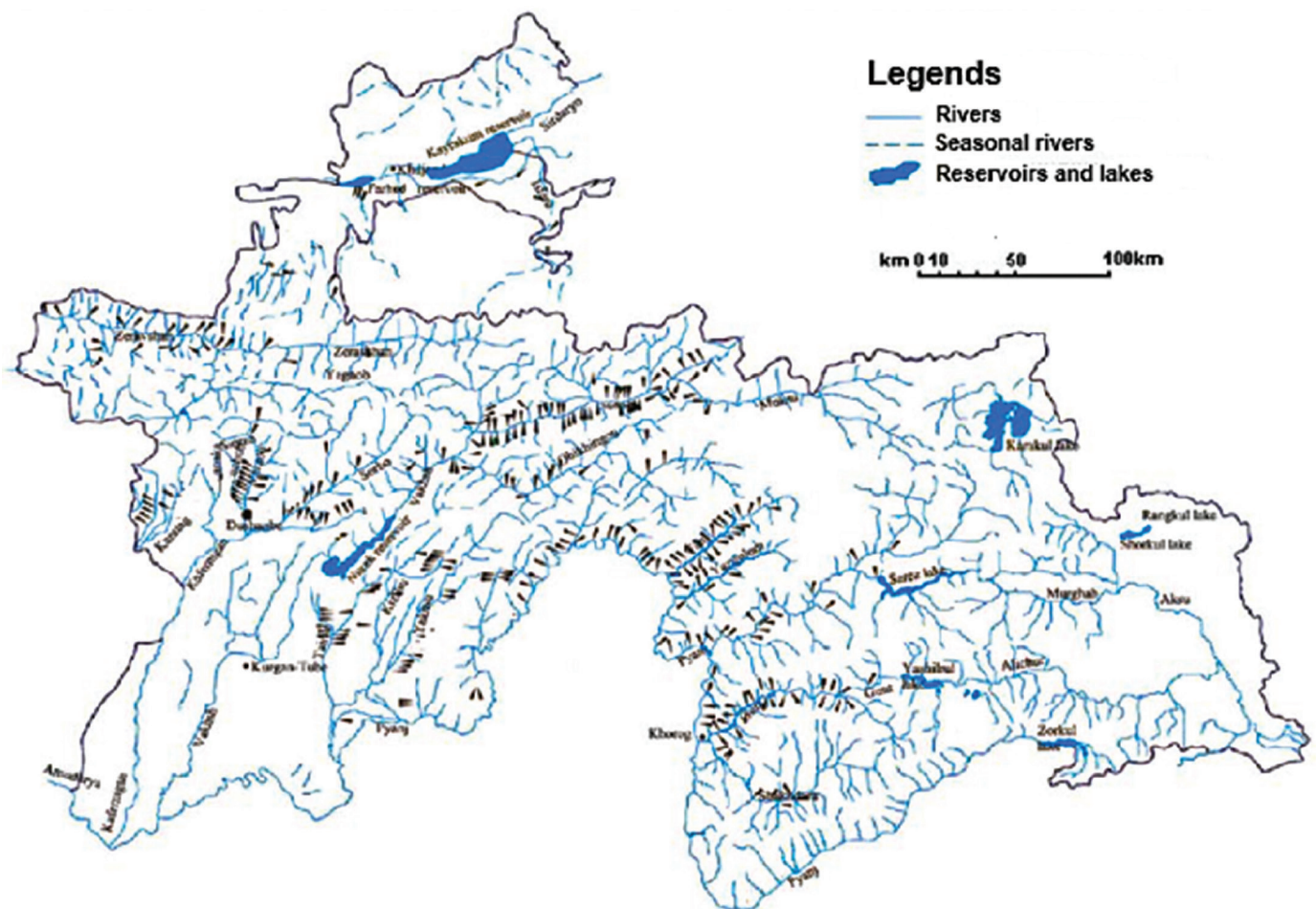


Water Resources

Tajikistan's unique mountainous terrain features vast reserves of snow and ice concentrated in its highlands. The climatic boundaries of perennial frost lie at elevations of 3,500-3,600 m in the west and rise to 5,800 m in the east. The total area covered by glaciers in Tajikistan exceeds 8,476 km², with over a thousand glaciers measuring more than 1.5 km in length. Sixteen glaciers are longer than 16 km, including the Vanjyakh (Fedschenko) and Grumm-Grzhimaylo glaciers. The Vanjyakh Glacier is among the world's ten largest glaciers.

Tajikistan's most precious wealth lies in its rivers and lakes, which are systematically fed by glaciers. The country's major water arteries are the Amu Darya and Syr Darya rivers and their tributaries. Significant rivers in Tajikistan include the Panj, Vakhsh, Kofarnihon, Bartang, Gund, and Zarafshan, all of which are major tributaries of the Amu Darya River, which flows into the Aral Sea basin. Tajikistan boasts a total of 947 rivers with lengths exceeding 10 km, and with a combined length of over 28,500 km. The potential hydroelectric power resources of these rivers is estimated at about 527.06 billion kWh per year.

Tajikistan is also rich in lakes, with approximately 1300 lakes in the country, containing about 46.3 km³ of water, including over 20 km³ of freshwater. The total water surface area of these lakes covers 1005 km², which is approximately 1% of the country's territory. The genesis of these lakes is primarily tectonic, glacial, and karstic in nature.



Glacial and debris flow lakes are the most common types. Glacial lakes are widespread in the Northern and Eastern Pamirs. Among them are some of the world's highest-altitude lakes, including Chapdara Lake (4,529 m), Karakul Lake (3,914 m), Zorkul Lake (4,126 m), Turumtaykul Lake (4,213 m), and others. Glacial origins can also be attributed to the Kulikalon Lakes, Hazor Chashma, and Iskanderkul.

Debris flow lakes are found in the highlands of the central and eastern parts of Tajikistan. These include the Marguzor Lakes, Sarez Lake, and Yashilkul. These lakes are primarily fed by glacial and snowmelt runoff.

The youngest lake in Tajikistan is Sarez Lake, located in the Murghab River valley. It was formed in February 1911 as a result of the Usoi earthquake. The height of the dam created by this earthquake is over 600 m, and the volume of water accumulated in this lake is approximately 17.5 billion m³.

Tajikistan's reservoirs play a significant role in regulating river flow and enabling the utilization of its water resources for the benefit of the economies of the Aral Sea basin countries. The importance of these reservoirs becomes even more evident in the context of climate change. The reservoirs also have a crucial role in flood prevention and protecting economic infrastructure from the destructive impact of floods, which are common in Central Asia.

Tajikistan has constructed and operates 11 reservoirs, including the Bahri Tojik (Kayrakkum), Nurek, Baypazin, Kattasay, Muminabad, Selbur, Golovnoye, Daganasay, Farkhad, Sangtuda-1, and Sangtuda-2 reservoirs. In addition, the Rogun hydroelectric complex with its reservoir is under construction. The largest is the Kayrakkum reservoir, located in the northern part of Tajikistan, and Nurek, located in the central part of Tajikistan. The total surface area of all these reservoirs is 664 km², and their total volume is 15.344 km³, including 7.63 km³ of useful volume. This represents about 13% of the average annual flow of rivers in the Aral Sea basin.

Land Resources

The Republic of Tajikistan has the smallest land area of the Central Asian countries. Agricultural arable lands are the most important land resources in the country. Arable lands are located in the valley lowland and foothill areas and are used for cultivation of grains, fruits, and other crops. In the valley and lowland areas, the arable lands are often irrigated, but as the elevation above sea level increases, the proportion irrigated decreases. In the highlands, only about one percent is irrigated. The highland areas are mainly used as summer pastures.

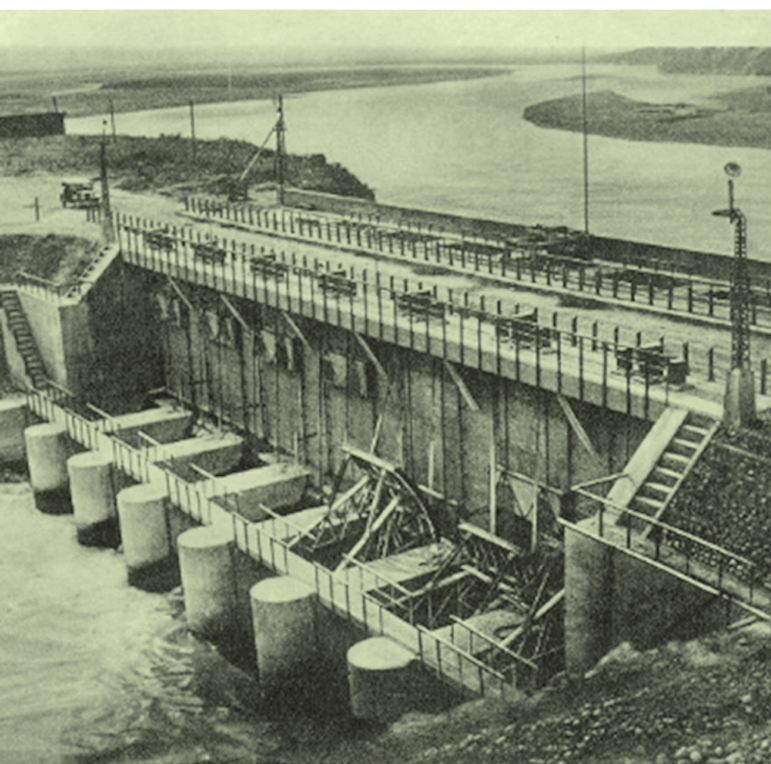
The potential area of land suitable for irrigation in the country is estimated at 1,570,000 hectares, or 11% of the total land area of the country. As of January 1, 2023, 763,900 hectares, or 48.6% of the total potential irrigated land area, have been developed for irrigation. The irrigated land per capita is only 0.07 hectares.

Approximately 80% of the country's agricultural production is from the irrigated lands. The total volume of water withdrawn from all sources for irrigation averages 8.0-10.0 km³ per year. More than 90% of the total water withdrawal from natural sources is used for irrigation purposes. About 70% of the country's active population is engaged in irrigated agriculture, and over 20% of the country's gross domestic product (GDP) is generated from agricultural production.

History of the Development of Irrigation and Drainage in Tajikistan

Ancient periods

Tajikistan is a country with a rich history of ancient irrigation. Archaeological traces of ancient irrigation within present-day Tajikistan have been discovered extensively and date back to before the invasions of Alexander the Great, the Arab Caliphate, and the Bukhara Emirate. To this day, ancient canals and aqueducts have been preserved in regions such as Kabodiyon, Farhor, Pyanj, Bokhtar, Isfara, Asht, Kanibadam, Bobojon Gafurov, and others in the country.



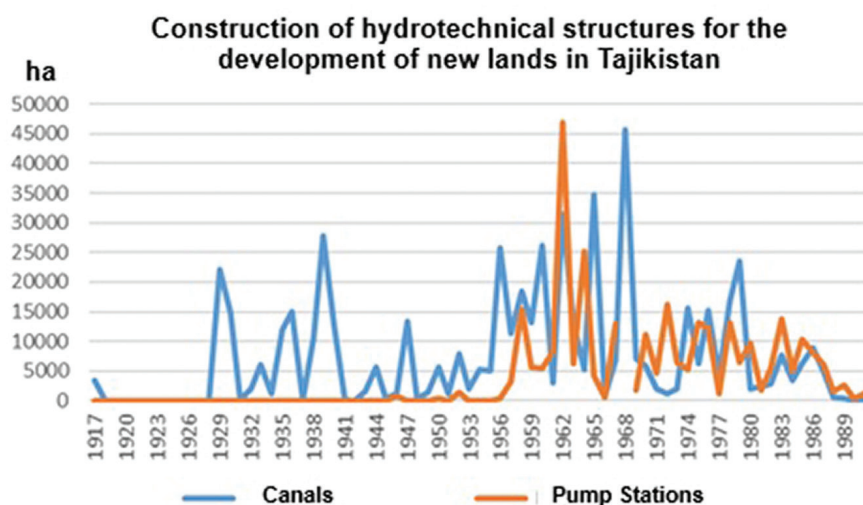
Civil War years

During the Civil War years, 1920-1924, a significant portion of the irrigation systems in the central and southern regions of Tajikistan were nearly completely destroyed. The total irrigated area at that time was just 52,000 hectares, and cotton cultivation occupied only 7,000 hectares.

Soviet period

In the early years of Soviet rule, 1925-1930, intensive survey and design work was carried out by the water management authorities of the Tajik SSR to develop new irrigated lands and restore the irrigation network and main canals such as the Dzhuybor and Dzhilikul canals in the Vakhsh Valley, Bolshoy Aryk in the Shaartuz District, Yangi and Kelyanchi in the Pyanj District, Shurabad in the Kuybyshev District, and others. The first pumping stations for irrigation on the Syr Darya River were also constructed at this time to irrigate about 2,000 hectares. By 1929, the old irrigation systems had been largely restored, and an increase in irrigated lands was achieved, adding approximately 63,000 hectares.

The early water legislation of Tajikistan primarily focused on regulating issues related to allocating land for the protection of water resources along canals and around irrigation structures, as well as their use for production purposes, and providing workers with land plots. It also addressed the



rights and responsibilities of Mirabs (traditional water distribution managers) and issues related to reclamation cooperatives. These matters remain relevant in the field of water management to this day.

During 1930-1937, the first phase of the Vakhsh irrigation system was completed, providing sustainable water use over 50,000 hectares for existing irrigation and an additional 22,000 hectares of new land. One of the largest hydraulic structures of that time, a reinforced concrete sluice regulator, and a main canal with a flow rate of 180 cubic meters per second, were constructed on the left bank of the Vakhsh River. This canal was used to divert water to the old canals of Dzhuybor and Jilikul, with subsequent expansion and improvement. Improvement of the reclamation state of lands began in the Kurghan-Tyubinsky and former October and Jilikul districts over previously irrigated lands. In the same period, work began on the restructuring and development of the Khoja-Bakirgan irrigation system in northern Tajikistan. The increase in new irrigated lands from 1933 to 1937 totalled 32,000 hectares.

From 1938 to 1941, at the initiative of Uzbek and Tajik cotton growers and with the method of hashar (construction by the community), collective farmers from Uzbekistan and Tajikistan quickly built the Great Fergana Canal and later the Northern Fergana Canal.

In 1940, construction work began in the central part of Tajikistan on the 50 km long Great Gissar Canal. For this purpose, a dam with a water intake capacity of 80 m³/s was built on the Dushanbe River, ensuring sustainable water use for 30,000 hectares of irrigated land and the development of over 10,000 hectares of new land. This system was put into operation in 1942.

Through hashar, the collector and drainage network for land reclamation in waterlogged and saline areas in the Vakhsh and Gissar valleys, in the basins of the Yakh-Su and Kyzyl-Su rivers, and in the north of the country was reconstructed. The equipping of these systems with hydraulic structures continued, and after construction work began on equipping the systems with water intake devices.

By the beginning of 1943, the irrigated land area reached 330,000 hectares. In that year, the reconstruction of the Guriat Canal in the Gissar district and other measures to increase the water supply of the systems were carried out. From 1946 to 1949, efforts were made to restore irrigated land that had fallen out of agricultural use, further equip the systems with hydraulic structures, and develop the collector and drainage network in the Vakhsh and Gissar valleys, in the north and southeast of the country. In 1947, the Farhad Reservoir was commissioned.

In 1947-1949, the construction of the Undzhin and Naus pumping stations began. Main water intakes were built on the Chubek and Shurabad canals, and major works were done to transition to the



new irrigation system (1950-1953). In 1952, the engineering water intake for the Pyanj irrigation system was completed. In 1951, the reorganization and development of irrigation in the Farkhar district began, and the Mastcho irrigation system was constructed. From 1958 to 1964, work was carried out on the reorganization and development of irrigation in the Kulyab zone. In 1959, the Bahri Tojik reservoir (Kayrakkum) was put into operation to enable the development and irrigation of lands in Tajikistan, Kyrgyzstan, Uzbekistan, and Kazakhstan, covering more than 300,000 hectares. For this reservoir, 54,500 hectares of fertile lands in the northern part of the country were flooded.

Mechanized irrigation saw significant development with the introduction of Samgar, Khoja-Bakirgan, Golodnostepsky, Ak-Gazinsky, Lyaur, and many other pumping stations. Vertical drainage systems were implemented, and shoreline pumping stations were constructed in the inundation zone of the Kayrakkum reservoir. Also, the Selbur, Muminabad, and Katta-Sai reservoirs were put into operation. After the construction of the main Vakhsh Hydroelectric Power Station on the Vakhsh River, the water supply for the Vakhsh main canal is obtained from the lower headrace of the dam, ensuring greater reliability of water intake and partially mitigating sedimentation. A large number of major hydraulic structures and canals were built, including the Isfara Hydroelectric Complex on the Isfara River, dams on the Khoja-Bakirgan and Khanaka Rivers, the Rohati main canal, and the Margedar Canal in the Penjikent district. From 1960 onwards, large-scale water management construction projects were initiated, including irrigation in the Yavan and Obikiik valleys, the Garauty area from 1961, the Kumsamgir plateau from 1963, and other regions.

During the development of the Vakhsh Valley, the number of structures on the Vakhsh system alone increased from 1,110 in 1956 to 3,145 in 1965. In 1968, the Vakhsh-Yavan tunnel was put into operation to irrigate over 40,000 hectares, and in 1970, the Yavan-Obikiik tunnel was commissioned to irrigate 12,000 hectares. To develop new lands in the Dangara Valley of Tajikistan and 1,054,000 hectares in Uzbekistan and Turkmenistan, the Nurek Reservoir with seasonal regulation was put into operation. The height of the dam is 300 m in 1986, the Dangara Irrigation Tunnel was commissioned, with a water intake depending on the water levels in the Nurek Reservoir and ranging from 910.0 meters above sea level to 857.0 meters above sea level. Water is supplied to the Dangara Valley through the Dangara Main Canal (DMK).

After the successful construction of the Nurek Reservoir, based on the directive of the Council of Ministers of the USSR dated March 26, 1981, No. 536, the construction of the Rogun Hydroelectric Power Plant (HPP) was included in the list of important industrial construction projects initiated in 1981 by the Ministry of Energy of the USSR. The main volume of the reservoir at the crest elevation of the dam at 335 m is 13.8 km³, including the initial useful volume of 10.5 km³, and after 50 years of operation, its volume has declined to 8.6 km³ due to sedimentation. This regulated volume allows for the development of an additional 480,000 hectares of land, including 140,000 hectares in Turkmenistan, 240,000 hectares in Uzbekistan, and 100,000 hectares in Tajikistan. Thus, the construction of the Rogun Hydroelectric Power Plant, often referred to as the construction project of the century, began in 80s of the last century.



Authorized state body in the field of irrigation and drainage in Tajikistan

The Agency for Land Reclamation and Irrigation under the Government of the Republic of Tajikistan was established based on the Decree of the President of the Republic of Tajikistan “On Improving the Structure of Executive Bodies of State Power of the Republic of Tajikistan” dated November 19, 2013, No. 12. According to this Decree, the former Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan was reorganized, and the political functions in

the water sector were transferred to the newly established Ministry of Energy and Water Resources of the Republic of Tajikistan. The functions related to land reclamation and irrigation were assigned to the newly established Agency.

The Agency for Land Reclamation and Irrigation under the Government of the Republic of Tajikistan is the central executive body of state power for land reclamation and irrigation. It carries out functions related to the development of a unified state policy and regulatory framework for land reclamation and irrigation, the use and preservation of water management facilities, the provision of irrigation water, and the protection of water resources.

The Agency is responsible for the operation and maintenance of water management facilities, the design and construction of new hydraulic structures, conducting bank protection works to prevent flood risks, for land development and water supply, supervising the meliorative state of lands and water use, coordinating the activities of the Association of Water Users, and managing water resources in the reclamation and irrigation systems at the basin and sub-basin levels of the country’s major and minor rivers.





Irrigation and Drainage

Irrigated agriculture is one of the key sectors of the economy in the Republic of Tajikistan, contributing to the achievement of the country's strategic goals, including food security and employment in rural areas.

In the Republic of Tajikistan, there are 763,900 hectares of irrigated land. Out of these, 550,000 hectares are serviced through irrigation infrastructure under the management of the Agency for Reclamation and Irrigation under the Government of the Republic of Tajikistan. The remaining 213,900 hectares are irrigated through irrigation facilities managed by local government authorities, dehqan farms, and other water users who draw water from mountain streams, springs, seasonal rivers, and underground sources (wells).

For the irrigation of lands under the management of the Agency for Reclamation and Irrigation, there are 26,700 km of main canals, 7,099 hydraulic structures, 505 vertical wells, 169 culverts, 110 aqueducts, 5,455 water distribution points, and 3,858 hydro-metric stations.

Out of the 550,000 hectares of irrigated land, 292,200 hectares, 52.9% are irrigated using pumping stations. To irrigate lands in the foothills, 228 cascade pumping stations with 914 pumping units have been constructed and put into operation, irrigating 214,700 hectares of agricultural land, lifting water by 2 to 7 levels by a series of pumping stations.

In total, the Agency for Land Reclamation and Irrigation has 393 pumping stations with 1,516 pumping units, 539,883 meters of high-pressure pipelines, 247 electrical substations, and 1,113 cells.

To maintain the irrigated agricultural lands in good meliorative condition, there are 12,000 km of collector-drainage networks, including 2,500 km of on-farm and 9,500 km of in-farm drainage systems. Among these, there are 5,600 km of open drainage and 3,900 km of closed drainage systems. Additionally, there are 2,484 observation wells, 1,208 vertical meliorative wells (of which 422 are on the balance of the Agency), 1,303 irrigation wells (of which 110 are on the balance of the Agency), and 97 observation hydrological posts located on the territory of irrigated lands.

Out of the total area of irrigated lands, the area under meliorative control is 700,200 hectares, 91.6%, while the area subject to soil-salinity monitoring is 635,600 hectares, 83.2%. Among the total area of irrigated lands, 329,900 hectares, 43.1%, are equipped with drainage, including 81,000 hectares, 10%, with closed drainage systems.

The improvement of the meliorative state of land is an ongoing process. On one hand, the completion of melioration works enhances the condition of the land, but on the other hand, improper agricultural practices, irrigation techniques, untimely cleaning of collector-drainage networks, inadequate technical maintenance of vertical drainage wells and deteriorating pumping stations, improper flushing of saline soils, and the use of drainage water for irrigation with high salinity year after year can lead to unsatisfactory meliorative conditions of arable land.

According to the program “Improving the Meliorative Condition of Irrigated Agricultural Land in the Republic of Tajikistan for 2019-2023” which was adopted by the resolution of the Government of the Republic of Tajikistan on August 1, 2018, No. 374, it was planned to improve the meliorative condition of irrigated agricultural land over the past 5 years over 48,572 hectares at a total cost of 51.1 million Tajik somoni (US\$ 5 million).

Overall, within the framework of the Program for Improving the Meliorative Condition of Irrigated Agricultural Land in the Republic of Tajikistan for 2019-2023, during the period from 2019 to 2022 and in the first 6 months of 2023, melioration works have been carried out at a cost of 42.53 million Tajik somoni (US\$ 4 million), 83% of the planned amount. The improvement of unsatisfactory meliorative conditions at the district and city level in the republic has been achieved over 44,597 hectares, 92% of the planned target. All activities within this program are expected to be completed by the end of 2023.

The analysis of data from the meliorative cadastre indicates that despite the annual implementation of melioration measures, a portion of the meliorative condition of irrigated agricultural land remains unsatisfactory.

According to the meliorative cadastre data as of January 1, 2023, the meliorative condition of the irrigated lands are as follows: (i) in good condition 593,892 hectares, (ii) in satisfactory condition 137,765 hectares, and (iii) in unsatisfactory condition 32,273 hectares. Additionally, the critical groundwater depth is observed over an area of 19,021 hectares, soil salinity affects 10,666 hectares, and both critical groundwater depth and soil salinity are found over 2,586 hectares.



One of the main reasons for the unsatisfactory condition of reclamation lands is the untimely cleaning of collector-drainage networks, the unsatisfactory condition of reclamation pumping stations, non-functional vertical wells, and a lack of reclamation machinery and equipment. The impact of these factors is disrupting the water-salt balance in the soil.



In order to regulate the water-salt balance over irrigated lands, 12,000 km of collector-drainage networks have been constructed, but due to insufficient equipment and funding, only 600-700 km are cleaned each year. To improve the reclamation status of irrigated lands, it is necessary to clean and repair at least 4,000 km annually.

During the period from 2008 to 2013, according to the decisions of the Government of the Republic of Tajikistan, 1,169 vertical wells were transferred to the balance of farmer households and Jamoats. The repair and maintenance of the transferred vertical wells and drains are also considered one of the measures to improve the reclamation status of irrigated lands.

Water Resources and Use

The water sector of the Republic of Tajikistan is important for the socio-economic development of the country. In Tajikistan, on average, 64 km³ per year, 55.4% of the water resources of the Aral Sea basin is contributed, including 62.9 km³, 80.17%, from the Amu Darya basin and 1.1 km³, 3%, from the Syr Darya basin.

SOURCES OF SURFACE RUNOFF IN THE ARAL SEA BASIN

Countries	Amu Darya		Syr Darya		Total	
	km ³	%	km ³	%	km ³	%
Kazakhstan	-	-	4.50	12.12	4.50	3.89
Kyrgyzstan	1.90	2.42	27.40	73.77	29.30	25.35
Tajikistan	62.90	80.17	1.10	2.96	64.00	55.36
Turkmenistan (with Iran)	2.78	3.54	-	-	2.78	2.40
Uzbekistan	4.70	5.99	4.14	11.15	8.84	7.65
Afghanistan	6.18	7.88	0.00	0.00	6.18	5.35
Total	78.46	100.00	37.14	100.00	115.60	100.00

Source: Basic provisions of the water strategy for the Aral Sea basin, 1996.



The water sector in Tajikistan encompasses various subsectors, including hydroelectric power generation, drinking water supply and wastewater management, reclamation and irrigation, industry, water recreation, environmental conservation, and more. On average, the annual water usage volume in these subsectors ranges from 8.0 to 14.5 km³ per year, depending on the water availability in a given year.

Depending on the water availability of the year, the total volume of water taken from all sources for irrigation averages 8.0-10.0 km³/year.

DISTRIBUTION OF AVAILABLE WATER RESOURCES IN THE ARAL SEA BASIN

Countries	Amu Darya		Syr Darya		Total	
	km ³	%	km ³	%	km ³	%
Kazakhstan	-	-	15.29	31	15.29	11.44
Kyrgyzstan	0.42	0.5	4.88	9.89	5.3	3.97
Tajikistan	10.63	12.6	3.66	7.42	14.29	10.69
Turkmenistan	27.07	32.1	-	-	27.07	20.26
Uzbekistan	46.2	54.79	25.49	51.68	71.69	53.64
Afghanistan	84.32	100	49.32	100	133,64	100
Total	78.46	100.00	37.14	100.00	115.60	100.00

Source: Clarification of the scheme for the integrated use and protection of water resources of the river. Amu Darya (1987), Clarification of the scheme for the integrated use and protection of water resources in the river basin. Syr Darya (1984).



Development of Water Users Association

Water Users Associations (WUAs) in Tajikistan are established with the aim of preserving and efficiently using in-farm irrigation systems that are collectively and individually owned. The main objectives include the fair, effective, and timely distribution of water among its members and other water users, collecting fees for water supply services, and resolving disputes between members and other water users regarding water distribution and utilization. The activities of the Water Users Associations are governed by the Law of the Republic of Tajikistan “On Water Users Association” dated January 2, 2020, No. 1668.

According to the resolution of the Government of the Republic of Tajikistan dated April 29, 2020, No. 241 “On the Determination of the Authorized State Body for Coordinating the Activities of the Water Users Association” the Agency is the authorized state body for regulating state support to the Water Users Association.

Currently, there are 339 Water Users Associations registered in the country, which provide irrigation water for 378,950 hectares of agricultural land, accounting for 68.9% of agricultural land, primarily in areas with gravity irrigation. However, their activities face several challenges, including a shortage of experienced specialists in WUA management, a lack of machinery and equipment, a low level of fee collection for water supply services and membership fees, as well as maintaining the meliorative condition of the land in satisfactory condition, efficient use of land and water resources, and so on.

Within the structure of the Agency, there is a Water Users Associations Support Unit, which in collaboration with the state administrations of land reclamation and irrigation in cities and districts and international organizations, carries out its tasks and responsibilities. As part of the reform of the water sector in Tajikistan, there are plans to complete the inventory of on-farm collector-drainage networks and transfer them to the balance of WUAs. Additionally, the creation of WUAs in areas with pump irrigation is being considered.





Water-related Disaster Risks Reduction

The impact of climate change in the country places a significant burden on the water sector. On one hand, there is acute water scarcity during drought years, and on the other hand, the frequency of natural disasters has increased. The country loses approximately \$400 million annually due to natural disasters, with an average of 500,000 people affected.

Tajikistan, being a mountainous country, is constantly exposed to natural disasters related to flooding, drought, mudslides, and so on. The country has 947 rivers and 276 lakes with a total length of about 30,000 km, many of which are prone to flooding. While the vast water resources bring benefits to the country, annual flooding, and mudslides result in material damage and human casualties in spring and summer due to rapid snowmelt, glacial melting, and heavy precipitation.

According to available data, severe flash floods, which can move at speeds of up to 6-8 m/s, repeat themselves up to 25 times every decade.

The area's most prone to flash floods are located in the basins of the Pyanj, Vakhsh, Surkhob, Yakhsu, Varzob, Kafirnigan, Khonako, Karatag, Zeravshan, Isfara rivers, as well as major seasonal rivers, in cities and districts like Kulob, Baljuvon, Temurmalik, Shamsiddin Shohin, Devastich, Asht, Spitamen, Penjikent, Shahrinav, and other districts. In the Pyanj, Vakhsh, and Zeravshan river basins, up to 70 flash flood events occur annually.

The Republic of Tajikistan has 1,386 km of protective structures and 710 protected riverbanks with a total length of 503 km. Due to landslides, floods, and avalanches, 416 km of protective structures and 136.5 km of riverbanks have been damaged. Additionally, as a result of natural disasters in 2015, more than 105 km of embankment structures were damaged, at an estimated cost of US\$ 454.14 million.

In total, according to the assessment of the Committee of Emergency Situations and Civil Defense and the Agency for Land Reclamation and Irrigation, 492.88 km of embankment and riverbed regulation works are required. This includes 60.2 km in the Gorno-Badakhshan Autonomous Region, 187.0 km in the Sughd Region, 120.78 km in the Khatlon Region, and 124.88 km in the Districts Republican Subordination.

Modernization of Irrigation and Drainage Systems with Climate Change Adaptation and Mitigation Measures

According to the National Climate Change Adaptation Strategy of the Republic of Tajikistan for the period until 2030, one of the vulnerable and climate-sensitive subsectors is irrigation and drainage.

In this regard, the Government of the Republic of Tajikistan attaches great importance to allocating funds from the state budget and attracting funds from international climate funds to take measures to modernize irrigation and drainage systems to adapt to climate change.

Within Central Asia, the Republic of Tajikistan ranks second after Kazakhstan in attracting financing from international climate funds. Over the past ten years, Tajikistan, has received approximately US\$ 450 million. These were mainly for modernizing water infrastructure and developing sub-sectors such as hydropower, drinking water supply and sanitation, land reclamation and irrigation/ agriculture, forests, pastures, household waste, transport, and so on. Currently, 2023/24, to implement projects to modernize irrigation and drainage systems, several major projects are being supported by international financial institutions and other development partners.

Main implementing projects:

1. The project on sustainable irrigation in Tajikistan is financed by the World Bank, the European Union and the Government of the Republic of Tajikistan
2. Climate- and Disaster-Resilient Irrigation and Drainage Modernization in the Vakhsh River Basin Project financed by the Asian Development Bank and the Government of the Republic of Tajikistan
3. Water resources management project in the Pyanj River basin financed by the Asian Development Bank and the Government of the Republic of Tajikistan
4. Project “Improving water resources management in Khatlon region” financed by the Islamic Development Bank and the Government of the Republic of Tajikistan
5. National Water Resources Management Project financed by the Swiss Agency for Development and Cooperation (SDC)
6. Modernization of irrigation systems in Tajikistan financed by the Eurasian Fund for Stabilization and Development of the Eurasian Development Bank and the Government of the Republic of Tajikistan

The above projects are strategically designed to enhance water resource management practices, facilitate the modernization of irrigation and drainage systems, bolster the reclamation of lands, and elevate the proficiency of the workforce within the reclamation and irrigation sector. Additionally, these projects are committed to fostering a holistic approach to sustainable water resources utilization, promoting technological advancements in irrigation infrastructure, optimizing land reclamation processes, and cultivating a highly skilled and knowledgeable workforce. The financial cost of these ongoing and planned projects amounts to about US\$ 220 million.



Activities of the National Commission on Irrigation and Drainage of the Republic of Tajikistan

The International Commission on Irrigation and Drainage (ICID), established in 1950, is the leading scientific, technical, international non-profit professional organization for irrigation and drainage. The professional network consists of experts from around the world in the fields of irrigation, drainage, flood control, and a wide range of agricultural water management activities.

The Republic of Tajikistan attaches great importance to the development of the field of reclamation and irrigation of the country in order to achieve the United Nations Sustainable Development Goals, and the National Development Strategy of the Republic of Tajikistan for the period until 2030.

Representatives of the Agency for Land Reclamation and Irrigation taking part in the 22nd International Congress on Irrigation and Drainage and the 65th Meeting of the International Executive Council of the ICID, which took place on September 14-20, 2014 in South Korea, expressed interest in renewing membership of the ICID. After consideration of this application by the decision of the Executive Council of the ICID, since 2014 the Republic of Tajikistan has been a member of the ICID.

To achieve these goals, by decree of the Government of the Republic of Tajikistan dated October 29, 2015, No. 620, within the framework of the activities of the International Commission on Irrigation and Drainage (ICID), the National Commission on Irrigation and Drainage in the Republic of Tajikistan (NCID) was established, as well as the position and composition of the NCID was approved. The Agency for Land Reclamation and Irrigation which is the central executive body of state power in the field of land reclamation and irrigation, carrying out the functions of developing a unified state policy and legal regulation in the field of land reclamation and irrigation, is entrusted with the functions of ensuring the participation of the Republic of Tajikistan in the work of the ICID.

The main goals of NCID are:

- Effective assistance in implementing a unified state water policy aimed at developing the land reclamation and irrigation sector;
- Rational use and protection of water resources, improvement of land reclamation status and increase in productivity of irrigated lands;
- Introduction of advanced irrigation technologies that ensure sustainable development of agricultural production;
- Development and implementation of measures to improve water resources management, taking into account water sector reform;
- Fight against leashes, regulation of riverbeds and economic improvement of the natural environment.



The main objectives are:

- Assistance in organizing and conducting international congresses and regional conferences, seminars, symposia and other forums of the ICID and NCID;
- Participation in the work of the ICID and its permanent working groups, organization of international and national events within the framework of the ICID;
- Assistance in drafting and developing policies, regulations, strategies, programs and plans for the development of the water sector;
- Identification and consideration of water management problems, modernization of water management facilities and irrigation systems;
- Assistance in improving land reclamation and irrigation management systems, improving the technical and economic foundations for the sustainable functioning of the sector;
- Attracting grants and loans to improve the land reclamation and irrigation sector, as well as for the implementation of NCID activities;
- Preparation and implementation of investment projects, scientific and technical cooperation for the development of the land reclamation and irrigation sector;
- Dissemination of best practices of foreign countries in the field of land reclamation and irrigation through the exchange of scientific and technical information.

Twenty representatives of ministries and departments are permanent members of the NCID, in addition, the NCID has 12 individual members.

Currently, with the support of development partners, NCID has organized 10 meetings and 3 conferences on the topic: “Water for sustainable development, the role of the land reclamation and irrigation sector in achieving its goals” dedicated to the International Decade of Action “Water for Sustainable Development” 2018-2028 years.

During the meetings, issues related to:

- Strengthening the economic and financial sustainability of the land reclamation and irrigation sector
- Information system and database in the land reclamation and irrigation sector
- Water and education
- Discussions on the development of the draft Law on Land Reclamation and Irrigation in the Republic of Tajikistan
- Discussions on the water-energy-food nexus
- The role of reclamation and irrigation in achieving sustainable development
- The current state of the pumping stations GNS, KNS and Somgar in the Sughd region and solutions for modernizing these stations
- Risks of natural disasters related to water in Tajikistan under climate change
- Development of science in the field of land reclamation and irrigation in Tajikistan and Central Asia
- Results of the analysis of the Water Code for the development of regulatory legal acts in the field of land reclamation and irrigation
- Preparation of investment proposals for the automation of electricity consumption metering at pumping stations in the Sughd region
- Preparation of investment proposals for the modernization of the State Tax Service in the Zafarabad district of the Sughd region





Secretariat of the National Commission on Irrigation and Drainage in the Republic of Tajikistan

Address: 5/1 Shamsi Street, Dushanbe, Tajikistan;

Tel.: +(992) 934 888838; +(992) 918 260052;

E-mail: secretariat@tajncid.tj

Web: www.tajncid.tj



Printed with support of
OSCE Programme Office in Dushanbe

