

SDG 6 Country Acceleration Case Study Uzbekistan

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SDG 6 Country Acceleration Case Studies

UN-Water coordinates the work of the United Nations (UN) on water and sanitation. UN-Water comprises 36 UN entities (Members) and 54 international organizations (Partners) working on water and sanitation issues. UN-Water's role is to ensure that Members and Partners deliver as one in response to global water-related challenges.

In recent years, we have seen modest progress towards meeting Sustainable Development Goal 6 (SDG 6) as demonstrated by a majority of SDG 6 global indicators. However, this progress has been slow, fragmented and under-resourced. Falling short on water and sanitation targets undermines achievement of the sustainable development agenda and can even threaten hard-won development gains in other areas such as health, gender, jobs, environment, food security, education, energy, resilience, economic development and stability.

It is not enough to look at what is not working. There is much we can learn from the many countries that have made considerable progress. The UN-Water SDG 6 Country Acceleration Case Studies aim to understand how some countries are advancing towards meeting their goals on water and sanitation. The case studies highlight achievements and describe processes, enabling conditions and key lessons learned in countries selected for their progress on SDG 6. Therefore, each case study is a significant recognition of the progress made at the country level on one or more SDG 6 targets.

The case studies are designed to enable the replication in other countries of what has worked and encourage continued action to achieve SDG 6 in the selected countries. The 2030 Agenda for Sustainable Development and in particular the SDG 6 targets form an overarching lens for the case study to capture interlinkages and opportunities.

Starting in 2022, UN-Water has published three country case studies each year. The selection of the case studies is made by the UN-Water Expert Group on the 2030 Agenda for Sustainable Development, based on country progress reporting on the SDG 6 global indicators, compiled by the UN custodian agencies. In 2026, the Expert Group selected China, São Tomé and Príncipe and Uzbekistan for the case studies.

The contents of the case studies are prepared by UN-Water, based on material shared by UN-Water Members and Partners and representatives from relevant ministries and institutions in the selected countries, including the country monitoring focal points for the SDG 6 global indicators. This case study includes inputs from background interviews with a variety of stakeholders, conducted online and in-person, as well as one preparatory workshop, held in Tashkent in March 2026. The case studies are reviewed and validated by UN-Water Members and Partners before publication.

To enable cross-country comparison and learning, the case studies examine key underlying factors and enabling conditions that brought about the changes. Very often these are political, institutional or behavioural, and they span the five global accelerators identified in the SDG 6 Global Acceleration Framework: financing, data and information, capacity development, innovation and governance.

So far, the following countries have been selected for country acceleration case studies:

2022: Costa Rica, Pakistan, Senegal

2023: Brazil, Ghana, Singapore

2024: Cambodia, Czechia, Jordan

2025: Bhutan, Rwanda, Saudi Arabia

2026: China, São Tomé and Príncipe, Uzbekistan

More information: www.unwater.org/publications/country-acceleration-case-studies

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View of the Charvak reservoir
Photo: Marsid Maharoof/pexels

Executive summary

Until 2017, the level of water stress in Uzbekistan kept increasing. Since then, the country has made huge efforts to promote water saving and reduce water withdrawals. For an arid country in a context of climate change, these changes have been critical, as non-renewable water resources are being depleted and insufficient water is left for water-related ecosystems, such as the Aral Sea, whose disappearance is among the largest environmental disasters of our time and will have lasting consequences on public health and socioeconomic development. How has progress been possible? This case study presents the main drivers that enabled acceleration, ranging from government leadership to the mobilization of financial resources, and including capacity development, the improvement of data and the information base, as well as innovative solutions. At the same time, there is still a long way to go to reduce withdrawals to sustainable levels and fully achieve all SDG 6 targets by 2030. Key factors and drivers that may be replicated in other countries include the following:

- **The highest level of government is committed to water and has ambition.** The Uzbekistan – 2030 national development strategy prioritizes key actions.
- **Cooperation with neighbouring countries and international partners on water is strong.** The country is engaged at the transboundary, regional and global level.
- **Water service providers replace water user associations.** Combined with agro-industrial clusters, this strengthens operational capacity at the local level.
- **Public investment for large infrastructure has been scaled up.** Uzbekistan is investing in lining canals with concrete and the modernization of pumping stations.
- **Soft loans are combined with subsidies at the farm level.** Farmers have access to soft loans to install water-saving technologies and can then benefit from subsidies.
- **A School of Water Specialists has been established with branches in all districts.** Capacity development accelerates the deployment of water-saving technologies.
- **Quality requirements are established for technology providers.** Access to subsidies is conditional upon certification, which is important to derisk investment.
- **Smart meters are deployed together with electronic payments.** This increases fee collection and provides useful data for decision-making.
- **Analytical reports are produced to support water allocation at the regional level.** Twice per year, data are shared about forecast and actual water availability and use.
- **Research on drip irrigation of cotton is being promoted.** Promising solutions are emerging to reduce the water footprint of this strategic crop.
- **The former seabed of the Aral Sea is being afforested.** This innovative solution represents one of the largest nature restoration initiatives in the world.

The experience of Uzbekistan is highly relevant for other countries, particularly Central Asian republics, other water stressed countries and parts of the world with endorheic basins. Countries that want to accelerate reduction of water stress should look at how Uzbekistan is managing to deploy water-saving technologies. Uzbekistan is making substantial progress towards installing such equipment, aiming at reaching all cultivated land by 2030. Moreover, countries that want to blend financial instruments and capacity development should be interested in how Uzbekistan is combining soft loans and subsidies with training of farmers and water experts to derisk investment and mobilize the private sector.

1. Country context

Uzbekistan is a mid-sized landlocked developing country in Central Asia. Its rural population is slightly less than its urban one (Table 1). In 2025, the per capita yearly gross domestic product (GDP) of Uzbekistan was 3,161 United States dollars (US\$). It is therefore considered a lower-middle-income country, as well as member of the Landlocked Developing Countries (LLDC) group. Its economy has been growing steadily for the past 15 years, at a pace of more than 6 per cent on average every year. In 2025, around 21 per cent of the employed population worked in manufacturing and construction, representing about 31 per cent of GDP, and roughly the same amount of the population worked in the agriculture, forestry and fisheries sector, representing around 18 per cent of GDP. Uzbekistan is among the top ten producers of cotton in the world. Cotton production and the textile industry are important for the country's economy. Other important crops include wheat, potatoes, vegetables and fruit. The Republic of Uzbekistan was part of the Soviet Union. It became independent in 1991. The country is divided into 12 regions plus the Karakalpakstan Autonomous Republic and Tashkent City. It is further divided into 175 districts.

Water sits at the highest level of government. The Presidential Administration provides strategic and political guidance. The current president graduated from the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIAME) National Research University. The Ministry of Water Resources ensures overall water policy coordination and oversees surface water resources and management of irrigation, as the main water use, through eight subordinate organizations, including the Agency for the Operation of Water Management Facilities, and 12 irrigation system basin departments, which are regional branches of the Ministry. At the local level, district irrigation departments also play a key role. Other ministries oversee other main water uses: drinking water supply and sanitation are overseen by the Ministry of Construction, Housing and Communal Services and the Ministry of Health with the Uzsuvtaminot Joint Stock Company (JSC) as the main operator, while hydropower is overseen by the Ministry of Energy with the Uzbekhydroenergo JSC as main operator. Groundwater is under the responsibility of the Ministry of Mining Industry and Geology, while water-related ecosystems are under the National Committee on Ecology and Climate Change. Parliament also provides legislative oversight, particularly through committees on water-related issues in both chambers.

Uzbekistan – 2030

The country adopted two consecutive national development strategies for the quinquennia 2017–2021 and 2022–2026. The Uzbekistan – 2030 strategy followed them in 2023. Water has been a priority under each plan. In Uzbekistan – 2030, Target 62 aims to increase the culture of rational use of water and the efficiency of water use, Target 63 to ensure rational use of water resources in agriculture and Target 64 to develop the irrigation system and water-saving technologies, as well as to widely introduce private-sector and public–private partnership mechanisms in field management. The plan includes performance indicators, a numerical baseline, yearly targets, the funding source and the responsible agency.

More information: <https://strategy.uz/>



Source: Development Strategy Center

Table 1: Overview of water-related key data

Population	36,361,859 (49% rural) Source: World Bank (2024)
Gross domestic product	US\$ 3,161 per capita/year (lower-middle income) Source: World Bank (2024) (current US\$)
Renewable freshwater resources	1,398 m ³ per capita/year (total, 66% external) Source: Food and Agriculture Organization of the UN (FAO) (2022)
Main basins	Aral Sea, Amu Darya, Syr Darya, Zarafshon, Chirchiq
Water-related ecosystems	17,615 km ² (4% of land area) Source: UN Environment Programme (UNEP)
Freshwater withdrawals	92% agriculture, 5% municipal, 3% industry Source: FAO (2022)
Hydropower production	9.3% of electricity generation sources Source: IEA (2023)
Irrigated land	32,298 ha (14% of total agricultural area) Source: FAO (2023) (calculated)
Wetlands extent	7,943.72 km ² Source: UNEP (2016–2018) (average)
Drought risk	Medium to medium-high Source: World Resources Institute (WRI) Aqueduct 4.0
Flood risk	Low to extremely high Source: WRI Aqueduct 4.0

The Aral Sea crisis. Considering its renewable freshwater resources per capita (Table 1), Uzbekistan can be considered to be suffering from water stress but not from water scarcity at the national level, compared to other parts of the world. Locally, the situation can be quite different. More than half of the country is covered by deserts, with mountains in the eastern and south-eastern parts of the country, respectively the Tien Shan and Gissar-Alay ranges, and the Aralkum desert in the north-west. The Aralkum desert is the former seabed of the Aral Sea, which used to be one of the largest inland water bodies in the world and has now mostly disappeared due to decades of excessive withdrawals of water for irrigation, representing one of the largest environmental disasters of the last century. A vast area around the former Aral Sea suffers public health consequences from this disaster, as well as other socioeconomic and environmental issues. In the eastern part of the country, rain and snow can be intense and the risk of flooding is medium to medium-high.

All river basins are transboundary. The four main basins of the country are the Amu Darya, the Syr Darya, the Zarafshon River and the Chirchik River. They are all transboundary. The Amu Darya flows from the mountains of Tajikistan and Afghanistan, then along the border with Turkmenistan before reaching the northern part of Uzbekistan, where its water does not reach the Aral Sea anymore. Similarly, the Zarafshon River flows from neighbouring Tajikistan and through the cities of Samarkand, Navoiy and Bukhara but does not reach the Amu Darya anymore. Regarding the Syr Darya, Uzbekistan finds itself downstream from Kyrgyzstan,

both upstream and downstream from Tajikistan and upstream from Kazakhstan. Finally, the Chirchik River flows from neighbouring Kyrgyzstan and through the capital city of Tashkent before reaching the Syr Darya. The Pretashkent Aquifer is an important, largely non-renewable, underground reservoir that is shared between Uzbekistan and Kazakhstan. Other aquifers are found throughout the country. They play an increasingly key role for water supply.

Water infrastructure continued to be developed. Several canals were also built over the decades, bringing water to water-scarce parts of the country. Some of these canals are transboundary. In the eastern part, the configuration of the country makes it suitable for hydropower generation. Uzbekistan's most notable hydropower plants are those making up the Charvak–Khojiktent–Gazalkent cascade on the Chirchik River. According to International Energy Agency (IEA) data, hydropower generates about 9.3 per cent of the electricity used in the country. Some plants and their reservoirs are located on or near the borders with neighbouring countries. Several new hydropower plants of different sizes are planned both in Uzbekistan and in neighbouring countries. The country also possesses many large pumping schemes, using electricity to pump large amounts of water to higher altitudes for irrigation and other purposes. According to the World Bank, these pumps represent about 16 per cent of national electricity use in the country. They are being combined with solar power generation to reduce costs and greenhouse gas emissions. Reservoirs are also being built to increase water storage to tackle water scarcity and for climate change adaptation.



Photo: Bek1998

Qosh Tepa Canal

Upstream from the Amu Darya (the largest tributary to the Aral Sea), Afghanistan has been building a large canal since 2022 that is expected to withdraw a significant amount of water. In a context of water stress, this is pushing Uzbekistan to further accelerate progress in water conservation. While Afghanistan is not yet a party to the international agreements on transboundary rivers in the region, Uzbekistan is cooperating with Afghanistan on the construction of the canal to promote the rational use of water.

Water cooperation is strong. Rivers, aquifers, canals, reservoirs, hydropower plants and pumping schemes of regional and transboundary interest are managed in cooperation with neighbouring countries through an elaborate set of institutions and agreements. In 1992, the five Central Asian republics established the International Fund for Saving the Aral Sea (IFAS), which is led by the five presidents and whose board is led by the prime ministers of each country. The Interstate Commission for Water Cooperation (ICWC) operates under IFAS to perform water allocation functions in the region, as well as the Amu Darya and Syr Darya Basin Water Organizations (BWOs), which work to manage water resources more effectively across basins. A Scientific Information Center (SIC) was also established under ICWC. The headquarters of both BWOs and of SIC ICWC are all hosted in Uzbekistan, which also provides financial support. The country is a party to both the UN Water Convention and the UN Watercourses Convention and recently became a party to the Protocol on Water and Health.

Most of the water is used for agriculture. According to data from the Food and Agriculture Organization of the UN (FAO), agriculture represents 92 per cent of water withdrawals in Uzbekistan. Municipal uses represent around 5 per cent of withdrawals, while industrial ones are limited to around 3 per cent. This figure does not consider the water used for hydropower generation, which is returned to the environment. According to the same source, freshwater withdrawals amount to around 42.9 billion cubic metres per year, corresponding to almost 3,500 litres per inhabitant per day, around 180 litres of which are used for municipal purposes on average. This figure is extremely high, especially in a country facing water stress. For this reason, Uzbekistan is investing significantly in water conservation.

Access to safe drinking water and sanitation is relatively high. According to the UN Children's Fund (UNICEF) and World Health Organization (WHO) data for 2024, 98.6 per cent of the population in urban areas has access to safely managed drinking water, compared to 77.7 per cent in rural areas. Overall, the proportion of the population using improved, though not necessarily safe, drinking water services has reached 98 per cent, with 80.9 per cent of the water coming from centralized water supply systems and 19.1 per cent from non-centralized sources. The same year, safely managed sanitation reached 75 per cent of the population. In this regard, the situation tends to be better in rural areas – where 86 per cent of the population has access to safely managed sanitation services, than in urban areas – where it is limited to 63 per cent of the population. On average, 82 per cent of the population has access to hand-washing facilities with soap and water at home. In rural areas, however, access drops, with 25 per cent of the population lacking access to hand-washing facilities.

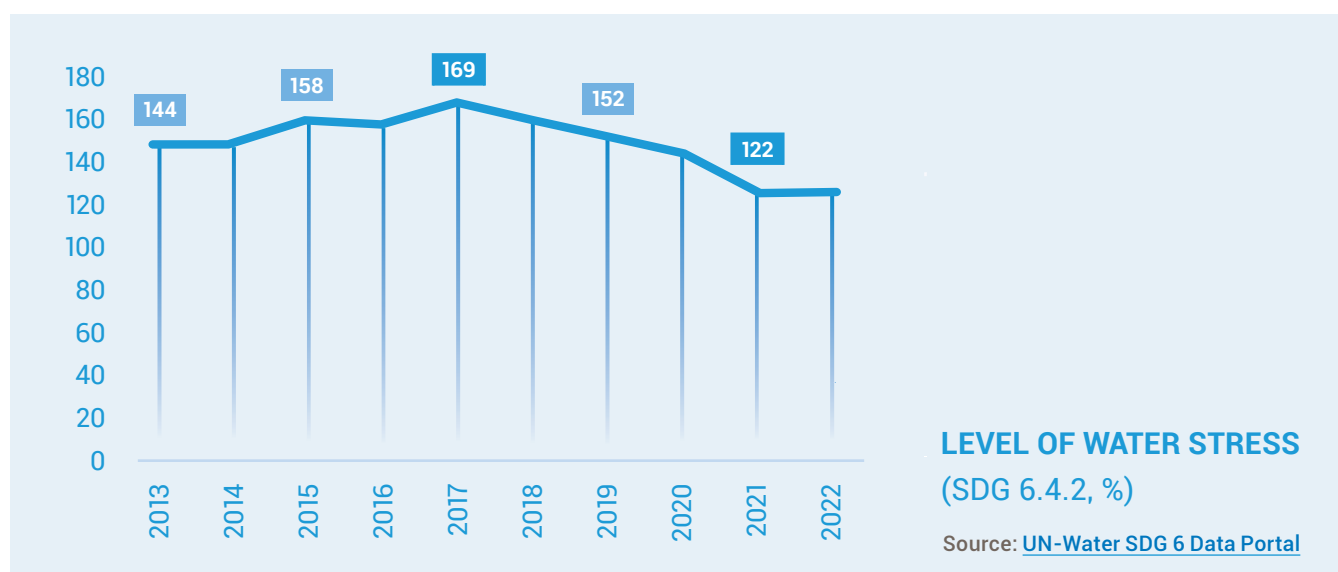
Water-related ecosystems are suffering. According to UN Environment Programme (UNEP) data, there is less water in rivers, with river flow diminishing by more than 10 per cent in the period 2017–2021 compared to the 2000–2019 baseline. In the same period, the extent of permanent surface water diminished by more than 20 per cent, accompanied by an increase in seasonal surface water. While there are no data reported to the UN about variation in wetland extent, water-related ecosystems have less water to rely on. Despite ongoing investment in wastewater treatment facilities, water quality also suffers when there is less water in rivers and lakes, resulting in higher concentration of sediments and pollutants in water. Turbidity has a significant economic impact. Sediments can provoke huge losses, as they damage water infrastructure, including drip irrigation pipes, and fill reservoirs, reducing hydropower generation capacity.

2. What was achieved

Uzbekistan made accelerated progress on reducing the level of water stress. In 2017, freshwater withdrawals peaked at 169 per cent of the total renewable freshwater resources available. This figure dropped to 122 per cent in 2021 (Figure 1). This is above sustainable levels and above the regional average of 69 per cent but represents a 47 percentage point reduction in only 4 years, representing one of the most remarkable progressions on SDG 6 at the global level. Data from the Ministry of Water Resources of Uzbekistan show that this corresponds to a drop from 58.9 billion cubic metres of total freshwater withdrawals in 2017 to 42.5 billion in 2021. According to the same data, the level of water withdrawals has been relatively stable since then. Looking at disaggregated data from FAO, most of the change appears to come from a reduction in irrigation withdrawals, which fell from 53.7 billion cubic metres to 38.5 billion in 2021. Industrial withdrawal also dropped by 0.9 billion cubic metres over the same period.

The country has also shown progress on other SDG 6 indicators. Besides the above-mentioned indicators, according to the data available to UN-Water's Integrated Monitoring Initiative for SDG 6, Uzbekistan has shown progress on SDG target 6.1 (access to safely managed drinking water) since 2015, reaching 80 per cent of the population, with an increase of 9 percentage points. The country has also shown progress on SDG target 6.5: according to data on SDG indicator 6.5.1, implementation of integrated water resources management (IWRM) progressed by 7 points to a level of 52 out of 100. The value of indicator 6.5.2 on transboundary water cooperation is medium-high, at 69.59%. While 100% of transboundary surface water is covered by an operational arrangement, there are no arrangements covering transboundary groundwater, even if progress is underway with the Pretashkent Aquifer.

Figure 1. Progress on SDG indicator 6.4.2 in Uzbekistan



SDG indicator 6.4.2 tracks how much fresh water is being withdrawn by all economic activities, compared to the total renewable freshwater resources available. When a territory withdraws 25 per cent or more of its renewable freshwater resources it is said to be “water-stressed”; values above 75 per cent are classified as high water stress, and values above 100 per cent as critical water stress.

The description of other SDG 6 indicators is available at www.unwater.org/our-work/integrated-monitoring-initiative-sdg-6

3. Understanding the achievement

This section describes how and why progress has taken place. It examines the direct and indirect factors that enabled the observed progress and focuses on which factors could be replicated in other countries. Five broad groups of enablers have been identified in the case of Uzbekistan: governance, financing, capacity development, data and information, and innovation. They correspond to the five global accelerators of the SDG 6 Global Acceleration Framework and are presented in order of relevance.

Governance: Leadership and pragmatic reform

Ambition and commitment at the highest level of government. In Uzbekistan, water is so important that the Head of State is personally engaged on the issue. The current President holds a high-level academic background with a focus on agricultural and irrigation mechanization. This gives him not only political but also scientific and technical legitimacy to lead on water-related issues. It also helps keep water on top of the political agenda. Water efficiency is prioritized in national development strategies, including the Action Strategy for the Five Priority Areas of Development 2017–2021, the New Uzbekistan Development Strategy 2022–2026, as well as the latest one, which is entitled Uzbekistan – 2030. This strategy includes ambitious goals, such as deploying water-saving technologies, including drip and sprinkler irrigation and laser levelling, over 100% of cultivated land by 2030, saving up to 15 billion cubic metres of water annually by 2030, reducing irrigation water losses by 25 per cent and ensuring the full digitization and automated management of 200 000 water intake points.

Cooperation with neighbouring countries. All major river basins of Uzbekistan are transboundary. Fourteen aquifers are also transboundary. In the last decade, Uzbekistan improved relations with neighbours. This is essential for Uzbekistan, as a downstream country that depends on water coming from across the borders, but also for countries located further downstream. For instance, Uzbekistan is investing in joint hydropower projects in Tajikistan and Kyrgyzstan, upgrading pumping stations together with Turkmenistan, developing cooperation over groundwater with Kazakhstan, as well

The SDG 6 Global Acceleration Framework is a unifying initiative that aims to deliver fast results, at an increased scale, towards the goal of ensuring the availability and sustainable management of water and sanitation for all by 2030. The Framework forms part of the UN System-wide Strategy for Water and Sanitation, which was launched in July 2024.

More information: www.unwater.org/our-work/sdg-6-global-acceleration-framework

as providing technical assistance to Afghanistan. Joint commissions and working groups were established with neighbouring countries.

Participation in regional arrangements, including IFAS and ICWC. Regarding IFAS, the Head of State and Head of Government of Uzbekistan regularly participate in IFAS summits and board meetings, while Uzbekistan's representative to its Executive Committee (EC IFAS) takes active part in its activities. Uzbekistan is particularly involved in ICWC, hosting and funding the headquarters of SIC ICWC, BWO Amu Darya and BWO Syr Darya. Uzbekistan also strongly engaged in regional initiatives such as Blue Peace Central Asia (Switzerland) and Green Central Asia (Germany), as well as the UN Special Programme for the Economies of Central Asia (SPECAs) and its Working Group on Water, Energy and Environment.

Engagement at the global level. At the global level, Uzbekistan, along with Kazakhstan, are the only two countries in the region to be party to both the UN Water Convention and the UN Watercourses Convention. Also, Uzbekistan actively cooperates with the UN, particularly with FAO and UN Development Programme (UNDP) as long-standing partners supporting agricultural and rural development, where most water is used. The UN Multi-partner Human Security Trust Fund for the Aral Sea is a key instrument to support recovery efforts in Karakalpakstan, bringing together donors and UN partners.

Reform of the water sector to make it more effective.

The Concept for Water Sector Development 2020–2030 provides a clear vision for reforming the water sector. Its measures include the implementation of special programmes such as the Water Resources Management and Irrigation Sector Development Program 2025–2028, investing in the lining of canals with concrete, as well as the adoption of a new Water Code in 2025, which updated the legal framework, especially by strengthening payments for irrigation services, and the adoption of market-based mechanisms. The approach remains strongly oriented towards technological solutions for saving water, while alternative solutions can be explored, such as behavioural change, water allocation, crop rotation, as well as improved seeding. The application of the basin approach is limited to BWO Amu Darya and BWO Syr Darya. The irrigation system basin departments are organized at the regional and district level.

Evolution of water user associations into service providers. The former water user associations (WUAs), which were non-governmental organizations (NGOs) that depended on payments from farmers, were replaced by state institutions called Water Supply Service as lowest level service providers. They operate under the Ministry of Water Resources and provide water services to agricultural producers at the irrigation scheme level. The Water Supply Service is financed in part by the state budget and in part by a tax on water use. User satisfaction with WUAs used to be limited because of the low quality of the on-farm irrigation services provided. This resulted in low levels of fee payment, which further limited the capacity of WUAs to fulfil their function. The Water Supply Service is expected to address this issue by combining support from the state budget with technological solutions such as digital metering and electronic payments for water use. Moreover, being under the Ministry of Water Resources increases the financial capacity of these organizations in terms of accounting practices and access to financial instruments.

Finance: Mobilizing public, private and user resources

Scaling up public investment for large infrastructure.

Uzbekistan is investing in large infrastructure, such as the lining of canals with concrete to reduce water losses and the modernization of large pumping stations to reduce power consumption and greenhouse gas emissions, and

to improve the financial situation of irrigation operators, as energy is their major cost. In addition to the renovation of pumps and pipes, photovoltaic farms are also being installed next to surface water pumps. These efforts are often supported by international financial institutions, including the World Bank, the Asian Development Bank (ADB), the European Bank for Reconstruction and Development and the Islamic Development Bank. These investments are sovereign loans backed by state guarantees and combined with technical assistance, often co-funded with grants from development partners. State guarantees and technical assistance help derisk investment and lower the cost of credit. Solid macroeconomic fundamentals and sound investment planning foster trust among financial partners, which may compete to provide support to the country.

Combining soft loans and subsidies at the farm level.

Uzbekistan is also promoting the deployment of water-saving technologies, such as drip and sprinkler irrigation, greenhouses and the laser levelling of land, which increases irrigation efficiency. Water users interested in installing such technologies are given access to soft loans for periods of five years with extremely low interest rates for the country, with returns of investment in two to four years. Interest rates are further reduced in Karakalpakstan and Khorezm. The programme is executed with the support of Agrobank, which is a major state-owned joint stock commercial bank, specializing in financing for the agricultural sector and rural areas. After farmers install the water-saving technology, the government exempts or reduces the water tax depending on the technology installed. Subsidies could be further improved to incentivize actual water savings rather than supporting certain technologies over others. Also, tax exemptions may have a negative impact on the financial sustainability of the energy sector, as these exemptions often translate into lower tariffs being paid for energy supply.

Promoting public–private partnerships to attract private investment.

Uzbekistan is diversifying the sources of revenue to fund water infrastructure and services. Besides the introduction of the water tax, which is based on water metering and adjusted depending on whether it is surface or groundwater and whether it is used for agricultural, industrial or other uses, water infrastructure is increasingly operated under public–private partnership schemes. This is the case for instance for large water pumps. By issuing concessions and similar instruments

to operate water infrastructure, Uzbekistan is successfully mobilizing private investment for irrigation water supply, reducing its dependence on the state budget while carefully regulating the services provided and maintaining control over this strategic issue.

Capacity development: From initial training to quality requirements

Creating a School of Water Specialists. To address the acute need for human capital and technical expertise within the water sector, the Ministry of Water Resources of Uzbekistan has launched a new and innovative School of Water Specialists. This initiative spans across all districts with strategic, financial and logistical support from Agrobank, which is the financial institution that is providing soft loans for water-saving technologies, thus making the school an instrument to promote the use of these financial products, while derisking investment at the same time. The school provides specialized training for farmers and water management professionals on the implementation of water-saving technologies and modern irrigation practices.

Clustering water users to increase capacity. Marking another shift from traditional WUAs, in 2022 Uzbekistan institutionalized agro-industrial clusters. Under this reform, clusters function as private agricultural operators empowered by public–private partnership arrangements to oversee irrigation infrastructure within designated territories. These clusters are responsible for the operation and maintenance of irrigation schemes, the distribution of water within established quotas and the implementation of water-saving technologies, often leveraging their financial standing to facilitate access to credit and low-interest loans for member farmers.

Establishing quality requirements for technology providers. To ensure the long-term sustainability and technical integrity of water-saving efforts, Uzbekistan has established a rigorous quality assurance framework for organizations providing water-saving technologies. Central to this approach is the Tomchi-reestr, which is a mandatory registry of contractors that serves as a prerequisite for farmers to access state subsidies through the Agroportal digital platform. To qualify for inclusion, service providers must demonstrate high technical standards, including the employment of certified engineering staff who provide essential on-site support and maintenance to farmers.

Training a new generation of water diplomats.

To strengthen regional cooperation and address the complexities of shared water resources in Central Asia, Uzbekistan has launched a master's programme in International Water Diplomacy at the University of World Economy and Diplomacy (UWED) in Tashkent. This innovative programme equips students with practical skills in negotiation, conflict resolution and multilateral water governance, reflecting both local and regional needs and international best practices. Supported by partnerships with regional institutions and international organizations, the curriculum fosters a multidisciplinary approach, preparing graduates to become leaders in transboundary and regional water cooperation.

Data and information: Digitalizing metering, monitoring and sharing

Combined development of smart metering and electronic payments. Uzbekistan is deploying networks of connected water sensors and smart meters, which enable accurate measurement of water use across agricultural and municipal sectors, as well as at the household and industrial level. These digital devices provide real-time data, supporting both the reduction of water losses and the development of tailored economic instruments such as volumetric tariffs and incentive schemes. Complementing this technology, electronic payment platforms have been introduced, allowing water users to pay for their consumption efficiently and securely, increasing transparency and accountability in the sector, and reducing non-commercial losses. The integration of metering and digital payments not only helps optimize resource allocation but also facilitates data-driven decision-making and supports efforts to strengthen the financial sustainability of the water sector.

Expanding the network of groundwater monitoring. The country has strengthened groundwater monitoring by expanding its network of observation wells across key aquifers and agricultural regions. This initiative, which received extensive support over several years from the German Society for International Cooperation (GIZ), is underpinned by strong national ownership, with local agencies actively overseeing the operation, maintenance and data collection from monitoring stations. The country has also implemented systematic tracking of drilling equipment to reduce the risk of unauthorized drilling and ensure compliance with environmental standards.

Regular data gathered from this network support both resource management and policy development, enabling authorities from the national to the local level to assess groundwater levels, quality and trends. To further advance groundwater management, Uzbekistan is prioritizing the integration of digital data platforms, enhanced capacity building for technical staff and the adoption of modern hydrogeological assessment tools. Continued investment in monitoring infrastructure and data analysis remains essential to protect groundwater resources and ensure sustainable water supply for communities and agriculture.

Reservoir observation and remote sensing. Uzbekistan has also taken significant steps to modernize reservoir monitoring by deploying an integrated network of connected sensors across major reservoirs, enabling real-time tracking of water levels, inflows and infrastructure conditions. Uzbekcosmos, the national space agency, has further enhanced screening capabilities by systematically mapping all reservoirs through satellite remote sensing, providing high-resolution imagery and hydrological data that inform water management decisions at both national and regional levels. These

advancements facilitate early warning for droughts and floods, improve resource allocation and support evidence-based policy development.

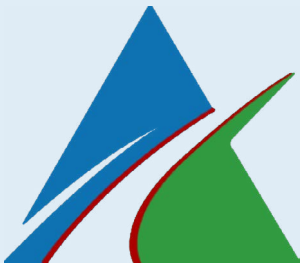
Analytical reports to support water allocation at the regional level. Since 2007, twice per year, the SIC ICWC, based in Tashkent and acting as a regional hub for water management, has been producing analytical reports that provide a comprehensive assessment of water management across the Amu Darya and Syr Darya river basins. These analytical reviews compile both forecast and actual data on key operational parameters, including river inflows, water releases, reservoir storage levels and water withdrawals. By systematically highlighting deviations between forecast and actual values and assessing the implications for the availability of water for withdrawal, these reports support adjustments to seasonal water allocation decisions of the ICWC. Over time, the reports also help build trust, strengthen cooperation and increase the sense of ownership among participating countries and economic sectors. The SIC ICWC is currently developing real-time data exchange in the region.

Tomchi app

This tool helps farmers and water users learn about modern water-saving technologies, along with advice on crop watering schedules and field practices that reduce water use. It helps farmers find local equipment suppliers and service providers and shares information on tax exemptions, soft loans and subsidies. It was developed with the support of the Swiss Agency for Development and Cooperation (SDC) as part of broader support for water sector reform and climate resilient water management in the country.



Source: Ministry of Water Resources of Uzbekistan



Source: Agency for Strategic Reforms

Delivery Unit model

Part of the Agency for Strategic Reforms, the model uses a citizen-focused, data-driven strategy to improve drinking water access and address sector fragmentation. This initiative involves university volunteers surveying rural schools and clinics, exposing gaps in water and sewage infrastructure. Data gathered are stored in a public geoportal and guide national investment in water, sanitation and hygiene (WASH).

More information: <https://asdr.gov.uz/en/about-du/>

Innovation: Finding new solutions to old problems

Afforestation of the former seabed of the Aral Sea.

Uzbekistan has made substantial investments to restore the landscape of the former Aral Sea, which has almost completely dried up, by implementing large-scale afforestation programmes, primarily focused on planting drought-resistant saxaul across vast stretches of exposed seabed. This represents one of the largest and most innovative nature restoration initiatives in the world, and is supported by several development partners. The National Academy of Sciences (NAS) and UNDP also organize scientific expeditions. To ensure the long-term sustainability and expansion of afforestation, there is a recognized need to establish additional nurseries dedicated to saxaul and other native species, thereby enhancing the natural regeneration of spontaneous growth of vegetation and supporting biodiversity.

Promotion of research on drip irrigation of cotton. Cotton is among the crops with the largest water footprints in the region. Uzbekistan is modernizing cotton irrigation by piloting, adopting and refining drip irrigation technologies, drawing on expertise and technology transfer from Israel, China and other countries. Research institutions, such as the Scientific Research Institute of Irrigation and Water Problems (SANIIRI), continue to advance research efforts, focusing on adapting drip systems to local soil and climate conditions and improving water use efficiency in cotton cultivation. These initiatives are complemented by

pilot projects and field demonstrations, which have shown substantial water savings, higher yields and reduced fertilizer applications compared to traditional surface irrigation methods.

Digitization and automation of infrastructure. Uzbekistan is drawing on expertise from Australia, Korea and other countries, to advance the digitization and automation of its irrigation infrastructure by leveraging international technology transfer and fostering local innovation. The country is implementing automated control systems across both inter-farm and intra-farm canals, enabling precise regulation of water flows and improving operational efficiency. Local companies have begun to adapt and scale these technologies, integrating sensors, remote monitoring and real-time data platforms to optimize water distribution and reduce losses.

Centres of excellence to drive innovation and research.

The National Research University "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" (TIAME) has gained international recognition for its contributions to agricultural engineering, irrigation technology and water resource management, consistently improving its standing in global university rankings. TIAME actively collaborates with international partners and hosts specialized programmes aimed at developing technical expertise and advancing best practices for efficient water use in agriculture. Several other institutions are playing leading roles to find innovative solutions and promote water saving.

International Innovation Center for Aral Sea Basin

Located in Nukus and operating under the President of the Republic, the centre serves as a hub for scientific research and technology development focused on restoring the Aral Sea ecosystem and fostering sustainable livelihoods in the region. It brings together experts to pilot innovative solutions for environmental restoration, climate resilience and community adaptation.



Photo: UN Photo/Eskinder Debebe

4. Recommendations for accelerated action in Uzbekistan

Some recommendations emerged from the analysis of the drivers of progress towards SDG 6, particularly from interviews and published material. Moreover, the SDG 6 Global Accelerator Framework also provides some indications of where action may be required to make further accelerated progress.

Uzbekistan invested in all five global accelerators.

It would not have been possible for the country to achieve progress on SDG 6, including accelerated progress on water stress, had it not employed five accelerators identified in the SDG 6 Global Accelerator Framework, namely governance, financing, capacity development, data and information, as well as innovation. Several actions contributed to this result. They include the leadership from the highest level of government, ambitious reforms, the mobilization of both public and private investment, the combination of capacity development and quality requirements, the digitalization of metering, monitoring and information sharing, and the promotion of centres of excellence.

The country needs to further reduce water withdrawals to achieve sustainable levels. Water withdrawals still exceed renewable freshwater resources. This means not only that the water left for water-related ecosystems is not sufficient but that every year Uzbekistan taps into non-renewable resources, especially groundwater. Environmental flow requirements must be calculated and respected, progressively but resolutely enforcing

limits. In this regard, it is important to further develop not only groundwater monitoring, but also groundwater protection, licensing, allocation and enforcement. Moreover, considering high temperatures and global warming, it appears important to decrease evaporation to further reduce water loss. For instance, it is possible to further develop closed underground systems, replacing where possible artificial reservoirs with tanks and open canals with pipes.

Other recommendations include further exploring strategies that extend beyond technological solutions, such as fostering mindset shifts, encouraging behavioural changes, improving water allocation practices, refining taxes, subsidies and access to concessional loans, supporting local adaptation, addressing salt management, and promoting nature-based solutions. Additionally, it is important to further promote the mobilization of private resources to enhance financing options for water-related initiatives. The development of trade in virtual water could also be considered, by increasing the importation of crops with high water requirements and reducing the export of goods that are water intensive. Finally, strengthening cooperation with neighbouring countries, including on transboundary aquifers, by providing technical assistance, promoting joint monitoring efforts and reforming existing institutions may well contribute to more effective water management.

5. Replicability in other countries

The experience of Uzbekistan is highly relevant for other countries, particularly Central Asian republics, other water stressed countries and parts of the world with endorheic basins. Countries that want to accelerate reduction of water stress should look at how Uzbekistan is managing to deploy water-saving technologies. Uzbekistan is making substantial progress towards

installing such equipment, aiming at reaching all cultivated land by 2030. Moreover, countries that want to blend financial instruments and capacity development should be interested in how Uzbekistan is combining soft loans and subsidies with training of farmers and water experts to derisk investment and mobilize the private sector.

Opportunities for experience sharing

Uzbekistan is engaged at the transboundary, river basin and regional levels. It is cooperating with neighbouring countries bilaterally and through regional institutions such as IFAS, ICWC, SPECA, the Regional Environmental Centre for Central Asia (CAREC), as well as other initiatives, such as the World Bank's Central Asia Water and Energy Program (CAWEP), ADB's Central Asia Regional Economic Cooperation (CAREC) programme, as well as the European Union's Team Europe Initiative on Water, Energy and Climate in Central Asia, Germany's Green Central Asia and Switzerland's Blue Peace initiative. In the region, the Dushanbe Water Action Decade Conference can also be a useful platform. These arrangements represent platforms for experience sharing.

Uzbekistan is a party to and actively participates in global water and environment conventions and processes, such as the UN Water Convention, the UN Watercourses Convention, the Ramsar Convention on Wetlands, as well as the three Rio Conventions and other multilateral environmental agreements. It recently joined the UN Water Convention's Protocol on Water and Health and is hosting the Conference of the Parties of several conventions. Moreover, Uzbekistan plans to host the Samarkand World Forum on Water Conservation, which allow sharing experience about the progress made on SDG 6 with many countries and partners.

2026 UN Water Conference

The conference will take place on 8–10 December 2026 in Abu Dhabi, United Arab Emirates, and focuses on how to accelerate the implementation of SDG 6. It represents an opportunity to share the experience of Uzbekistan with the rest of the world.



2026 UN WATER CONFERENCE

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