PROJECT REPORT

Water Infrastructure in Central Asia: Promoting Sustainable Financing and Private Capital Participation

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Supported by the Asian Development Bank

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ABBREVIATIONS

BVOs	Basin Water Organizations
BCT	Bukhara Cotton Textile
CAREC	Central Asia Regional Economic Cooperation
EBRD	European Bank for Reconstruction and Development
GDP	Gross Domestic Product
ICWC	Interstate Commission for Water Coordination
IFAS	International Fund for Saving the Aral Sea
IFIs	International Financial Institutions
ISF	Irrigation Service Fee
MOM	Management, Operation and Maintenance
NWC	National Water Council
O&M	Operations and Maintenance
PPPs	Public-Private Partnerships
SWA	State Water Administration
USD	United States Dollar
UZS	Uzbekistani Som
WCA	Water Consumer Association
WUAs	Water User Associations

EXECUTIVE SUMMARY

Investing in the water sector means investing in economic growth and sustainability. Water is part of every aspect of the economy, particularly in Central Asia—a region heavily dependent on water-intensive agriculture and energy products. Underinvested, undervalued, and underpriced, water becomes a crucial troublemaker across social, economic, and environmental dimensions. While unsafe water and sanitation can cause illnesses by enabling their easy proliferation through boundaries, droughts and floods provoke natural disasters that have broad implications for water, food, energy, and, above all, human security, among other factors. These, in turn, can unlock social and economic disruptions.

Ranking foremost of the countries vulnerable to the impact of climate change (CAREC Institute, 2020), Central Asian countries must allocate substantial investment to dilapidated and new water infrastructures without delay by integrating the latest technology and capacity solutions to increase efficiency in water consumption. The need for investment in the region's water is at an unprecedented level, which is becoming increasingly urgent by the impact of climate change.

Private capital cannot fully substitute government or existing funding for the water sector, although it can help to some extent to close the existing and emerging gaps in water financing. Considering the region's positive demographic development, the economic growth ambitions of the countries, and the growing impact of climate-induced events, **diversification of investments into the water sector must go beyond private capital participation**. The analysis in this report reviews the current state of financing and charts potential options for governments to consider in diversifying funding sources for water resources in Central Asian countries.

The countries of the region face the following obstacles:

- The rehabilitation of dilapidated infrastructure and the reconfiguration of water systems into individualized agricultural land units present infrastructure challenges for Central Asian countries. Currently, up to 60 percent of the water reserved for irrigated agriculture is lost before it reaches the irrigated plots.
- The mostly public, state-owned, and highly regulated nature of the water sector can be risky and therefore unappealing for FDI, private financing, and other types of funding.
- The water infrastructure built for large-scale collective farming has become difficult to manage and largely inappropriate for modern agriculture production; the quality of water services is in constant decline, putting food security and agricultural production at risk.

Policy recommendations:

- Governments should create a favorable regulatory framework for private sector players to manage investment risks and unlock value **by engaging effectively with government agencies, regulators, communities, and other stakeholders in decision-making and their execution.**
- **Governments in Central Asia should change their agriculture policies;** increasingly market-oriented, deregulated policies may encourage private companies to invest in water services. For the water supply companies, operating and maintaining the irrigation infrastructure may assist with water sector financing.
- It is an age of transparency. Revealing the necessary data and information through openness and a radical engagement with society and businesses of different scale has significant value.

In fact, **the long-term performance and sustainability of infrastructure are intrinsically connected with how well stakeholders integrate and cooperate with each other**, both across the relevant government agencies and others.

- **Capacity building and technology integration**. These are key areas for improving both the operation and maintenance (O&M) of the water infrastructure and the provision of professional water services. Moreover, the attraction of private partnerships could bring about more technological innovation in the water sector. Digital solutions and the wider application of new approaches in the water sector will increase the efficiency of water resources development and use.

INTRODUCTION

Water is arguably one of the most controlled and valuable resources in Central Asia with strategic importance for its socioeconomic development. It contributes 5 percent to 28 percent to the region's GDP through irrigated farming and almost 30 percent to the production of aggregated energy (Grewal et al., 2022; Botta et al., 2022,). Currently, the region, including Afghanistan, consumes 95 percent of the total available water (Regional Environmental Centre for Central Asia 2020). Considering the increasing demand for water owing to the inherent highly consumptive and water-intensive nature of their economies, Central Asian governments currently need innovative policies to make more productive and efficient use of this vital resource.

Even when the best way to increase financing for the water sector is a combination of private capital and public and other resources, private capital may not be readily available for a number of reasons. **Mobilizing public and private resources at scale while exploring innovative ways to spur new financing faces a range of complex difficulties, from the complicated regulatory environment to inefficient policies and a low-return financial framework.** These challenges are often rooted in, or made more difficult by, the low priority of the sector *vis-à-vis* other sectors, a limited awareness or understanding of water's real economic, social, and environmental value, and so on. The widespread undervaluing of water resources and of the potential benefits associated with investment by both public and private actors often constrains financing opportunities for the sector (OECD, 2022).

The legacies of the past—outdated infrastructure; aging road and rail networks; central planning of the economy; cross-border issues on energy and communication; and complicated transboundary water resources—are the immediate outcomes of mismanagement (Grewal et al., 2022; adelphi & Regional Environmental Centre for Central Asia, 2017). In addition, these complications strongly affected relationships among Central Asian countries and contributed to an estimated loss of USD4.5 billion annually owing to limited water cooperation in the region until recently (adelphi & Regional Environmental Centre for Central Asia, 2017). Insufficient water cooperation in the region affected non-water sector collaboration as well as undermining the huge benefits of regional trade, exchange, and movements of production factors.

According to the ADB, Central Asia's annual infrastructure investment needs at the baseline scenario are equivalent to USD33 billion or 6.8 percent of regional GDP (ADB, 2017), considering all types of infrastructure, including energy, transport, telecommunications, water, and sewerage. The inclusion of measures making this infrastructure more resilient to the impacts of climate change adds additional costs, increasing annual investments to USD38 billion or 7.8 percent of regional GDP (Table 1), which will only increase over time.

Table 1. Infrastructure investment needs by region, 2016–2030 (annual average, USD billion in 2015 prices).

Region	Baseline estimates	Share of GDP	Climate-adjusted estimates	Share of GDP
Central Asia	33	6.8	38	7.8
East Asia	919	4.5	1,071	5.2
South Asia	365	7.6	423	8.8
Southeast Asia	184	5.0	210	5.7
Pacific	2.8	8.2	3.1	9.1
Asia and the Pacific	1,503	5.1	1,744	5.9

Source: Asian Development Bank (2017)

The infrastructure investment needs of this government-dominated water sector have long been ignored since the Soviet era. The water sector has had a relatively low profile compared to other sectors—such as energy, transport, and telecommunications; it has limited investment flows. The biggest injections of capital for infrastructure are usually earmarked for the more critical sectors of the economy. Also, for a long-time water was the least reformed sector, retaining Soviet time-planning and management approaches until the mid-2000s. **Limited funding for operating and maintaining infrastructure undermined efforts to make changes in the water systems** (Abdullaev & Atabaeva, 2012). Properly delivered and resourced infrastructure drives the sustainable economic growth of societies and businesses, unlocking wide opportunities for the mobilization of productive factors and supply chain operations that provide essential services such as irrigation, transport, energy, and so forth. In the early 2000s, the countries started to exercise integrated water management with the support of international partners (Abdullaev & Rakhmatullaev, 2015). However, those reforms did not deliver the expected outcomes.

In Central Asia, not only the infrastructure but also the pertinent economic and financial regulations of the water sector are outdated, the development of which dates to the final decades of the Soviet Union. **The current financial system of the water sector still lacks efficiency and effectiveness indicators.** While the investment environment in the water sector is not supportive of private funding, high competition for public funds led to the deficiency in financing the water sector. Therefore, malfunctioning of the infrastructure owing to both aging and delayed operation and maintenance (O&M) became regular at all levels of the water systems across the region. The situation is especially dire at local and basin level in Central Asia. It is therefore imperative to set up sustainable financing mechanisms for the water sector.

Water availability determines economic performance, social coherence, and even political stability in the region as it is a transboundary resource that is in high demand for food, energy production, environmental safety, and livelihood security. The growing population and augmenting climate change impacts will further increase the demand for water in all spheres of the economy. This, in turn, makes the efficient management and infrastructure upgrade a salient change, redefining the future of water resources management in the region. This change can be brought about by well-equipped human capital with better comprehension of the real economic value of water and the ability to assimilate its value into the broader economic activities of the countries.

The analysis in this report includes the assessment of infrastructure financing needs, bottlenecks, types of financing, the potential for mobilization of private capital, the priorities of water infrastructure financing in the irrigated agriculture of five Central Asian states. In particular, emerging land users in Central Asian countries have started to invest in the on-farm water infrastructure. Increased international financing in sustaining large-scale water infrastructure and the construction of new hydrotechnical facilities have been also explored. The report documents and maps different, scattered experiences on the development of long-term sustainable water sector financing solutions in the region.

The research engaged five national consultants with task of reviewing water sector financing, obstacles and issues related to water financing, and legal and institutional aspects of private financing in five Central Asian countries. The main approach in this research includes a desk review of current water sector-related government documents, a review of current water policies through interviews with key experts, and the collection of statistical and sector data. The review of the current water infrastructure situation and 'best practices' of private financing of the water sector have been part of the focus of the national level analysis.

The analysis of five national reports (see Annexes) has been screened through a regional lens to identify general aspects, trends, and similarities/differences of water sector financing. The systematic analysis of the water financing practices, legal provisions, and institutional practices helped to highlight major areas for further intervention and improvement.

The outline of the report follows the substantive sections of the research, covering the current review of water financing in Central Asia (Section 1), water financing challenges and opportunities (Section 2), and summaries of separate country analysis (Section 3). Section 4 draws conclusions and charts a way forward by providing policy prescriptions.

SECTION 1. REVIEW OF CURRENT WATER SECTOR FINANCING IN CENTRAL ASIA

Central Asia faces an aging water infrastructure, most of which was built decades ago, during the Soviet period. Water leakage has become an issue and some systems report water-loss rates of up to 60 percent (Botta et al., 2022, Regional Environmental Centre for Central Asia 2020). While the investment backlog is growing, new critical issues are emerging to affect the water sector: the growing impact of climate change, unproductive agriculture practices, and water scarcity to name a few. These issues compel the countries of Central Asia to increase and accelerate water sector financing to repair existing infrastructures, increasing their efficiency, and build new ones to meet the growing demand. The reforms commenced in the early 1990s need to be revisited, rescaled, and renewed; government efforts undertaken over the last five years have laid a crucial foundation for the realization of these awaited changes.

The implementation of water and land reforms in Central Asian countries started in the 1990s, immediately after the collapse of the Soviet Union. Transforming the water and land management systems required change in the historical perception of the systems not only at national level, but also at local level (Sehring 2009). The Central Asian countries started the process of decollectivization and redistribution of land to farmers. As part of these land reforms, the process of establishing the water user associations (WUAs) started in all Central Asian counties with support from international organizations (Sehring, 2009; Abdullaev & Atabaeva, 2012; Abdullaev & Rakhmatullaev, 2013).

Water and land reforms were based on political will and the promotion of the reforms at local level. The reforms required the creation of new institutes at local level and the development of financial sustainability. The ownership rights for the irrigation systems were distributed among different structures based on the level of irrigation infrastructure. Thus, the state continued to own and control most of the water infrastructure, while transferring the usage rights to water management organizations and to other groups (such as, WUAs, farmers and so on).

Hence, the ownership of irrigation infrastructure in Central Asia is mostly public, although costs for the maintenance and operation of these systems are assigned to different organizations and supported through various financial mechanisms. The national budget covers mostly the large irrigation systems and the irrigation service fees, part of the national and local budgets cover interfarm systems, and local budgets cover on-farm canals and other local irrigation facilities. However, the governments are not able to fund in full all necessities of the water sector. Therefore, infrastructure, and human and transport needs of the water sector are currently inadequately addressed. Water user fees have been introduced in all Central Asian countries. However, **service fees are symbolic and do not cover the operational costs of water systems** (see Annexes for more information). Most of the irrigation sector infrastructure in Central Asian countries has not yet been privatized. Water systems are not attractive to private investors and are highly subsidized from state budgets (Table 2).

The provision of water services varies at different levels depending on type of infrastructure, institutional capacity, and water resources availability. The institutional part of the reforms should therefore include mechanisms to involve various stakeholders. Water institutions can promote state reforms on different levels, such as the introduction of services free of charge aimed at maintenance of the irrigation systems. However, despite the introduction of payment mechanisms, there is still a lack of finances to maintain the systems properly.

Table 2. Subsidies to the water sector in Central Asian countries (annual in million USD).

Countries	Total subsidies	To energy	To irrigation
Kazakhstan	150	70	80
Kyrgyz Republic	30	25	5
Tajikistan	32	20	12
Turkmenistan	45	20	25
Uzbekistan	50	40	10

Source: Regional Environmental Centre for Central Asia (2020).

The rehabilitation and reconfiguration of water infrastructure, making it fit into the individualized agricultural production, are major infrastructure challenges for the Central Asian countries. **Currently, from 30 percent to 60 percent of the water withdrawn for irrigated agriculture is lost before reaching the irrigated plots (Botta et al., 2022).** The operational, management, and development costs of the water infrastructure in Central Asia are huge (World Bank, 2016). Starting from 2010, national financing for the water sector started to improve, accounting for nearly half of the investment needed in the region's countries (Abdullaev, 2019). Financing is still mostly public, although user fees are introduced for each use: irrigation, drinking, and industrial use (Table 3). User fees cover only a fraction of the water delivery costs of different sectors. The major sector problems are low public financing, low collection rates of user fees, and reluctance of users to pay owing to unreliable water services and delivery.

Financing is a critical aspect of both the governance and management of the water sector. Public and private financing schemes are used for water sector financing in many parts of the world. However, neither of these schemes are considered to be a success. The infrastructure in the water sector is almost all public, although, at local level, O&M responsibility is given to different user organizations or owned by land farmers. There are no well-established cost-sharing financing schemes between public and private bodies. Most infrastructure maintenance is taken care of by state funding. Only regular repairs of local water systems are conducted by water users. At regional level, large-scale water infrastructure is funded and financed on territorial basis. Since the collapse of the Soviet Union, each country finances the infrastructure located within its territory.

Privatization, concessions, or any other private engagement in the water sector is not common in Central Asian countries. Both ownership and investment in the water sector by private players have never been observed in the region, prevented mainly by the high level of regulation and the unclear ownership of the water infrastructure. Although water agencies operate and maintain the infrastructure, ownership rights are not clearly defined. In some cases, ownership is with a municipality; in other cases, the infrastructure belongs to different line ministries or agencies (such as energy, water supply, and so on), which makes tracing the sources of financing streams challenging.

Table 3. Government roles in the water sector in Central Asia.

Country	Financing	Decision-making planning	Control of implementation
Kazakhstan	• Funding of major O&M needs, new infrastructure development • Local governments contribute to smaller infrastructure and O&M costs	• State sets long-term vision and strategies • Shorter-term decisions are made by local governments	• State controls water sector policy implementation through Committee for Water Resources
Kyrgyz Republic	• State provides major needs of the water sector • Contributions from water users—fees are sensible part of water sector financing	• State makes major decisions on sectoral water allocations • Local government is responsible for large infrastructure under its jurisdiction	• State is engaged in water sector policy implementation only partially; most of the control is done by local rural councils
Tajikistan	• State funds major costs • User fees contribute operational costs, at least for 30 percent to 35 percent	• Water planning is centralized • Local-level decisions taken by local government and water agencies	• Control of implementation of decisions in water sector is centralized and conducted by ministry
Turkmenistan	• State finances water sector costs fully at all levels	• Water planning is prerogative of central government	• State controls implementation of water decisions; water committee is responsible for control of implementation
Uzbekistan	• State finances water sector costs fully at all levels	• Water planning is prerogative of central government	• State controls implementation of water decisions, water committee is responsible for control of implementation

Source: Regional Environmental Centre for Central Asia (2020).

Private sector engagement in the water sector is also hindered by agriculture policies and land ownership issues. The agricultural water supply in Central Asian countries (including irrigation) is considered to be a social function of the state. Therefore, the state is not planning to introduce either a full market system for agriculture or the full price for water delivery. None of the region's countries has competitive land market for private sector participation in land resources management. Therefore, **water pricing is not market-based but rather regulated by the state.**

The service fees charged by state water organizations are not collected in full, because water users are reluctant to pay for an unreliable water supply. Fee collection ranges from 50 percent to 70 percent in Central Asian countries. However, lately the collection of household water supply fees has improved thanks to better metering and infrastructure improvements in this area. In irrigation water supply, service fee collection rights are still far too low to form a reasonable part of the O&M costs alone. The countries are trying to increase service collection rates by: introducing water metering (Uzbekistan); increasing the role of user organizations (Kyrgyzstan) and management organizations

(Tajikistan); and giving the right to retain part of the fees and introduce a more commercial model of water supply (Kazakhstan). None of these schemes in isolation can help to solve water-financing problems in the water sector; **more structural change is required to achieve sustainable water financing.**

The analysis of water sector financing in Kazakhstan revealed that different budget programs[1] support the water sector, mainly in the rehabilitation and construction of the water infrastructure. Even though water tariffs (irrigation, drinking water, wastewater services) have increased in the last few years, they are still limited to covering the O&M costs of water utility operators. The public budget for the water infrastructure is not sufficient; therefore, long-term loans were borrowed from international finance institutions. According to estimates from the Committee of Water Resources, about 925 billion tenge (USD192 million) is needed for the rehabilitation and reconstruction of the water infrastructure in Kazakhstan. The analysis of public–private partnership (PPP) projects in Kazakhstan revealed a limited focus on the water sector.

Water sector financing in the Kyrgyz Republic is also driven mainly by public funds—that is, state budget and development programs. Although, sector-specific funding has reduced considerably compared to that of the Soviet period, at present the Kyrgyz Republic spends USD14 million per annum on the sector's O&M and capital costs, covering only 40 percent to 45 percent of the required funding. The irrigation service fee (ISF) system in the country is performing poorly, and the resources collected from water users do not compensate for the expenditure incurred.

In Tajikistan, the main issue is the creation of a sustainable economic mechanism for the functioning of the water sector system and its adaptation to the development of a market system. This implies that the revenues of water management organizations from the provision of irrigation water supply and water diversion services in the long term should be sufficient to cover the costs of managing, operating, and maintaining, restoring, and replacing the worn-out water infrastructure. In the short term, budgetary and donor funding can be used to cover the gap in the new investment, but in the long term, the modernization and development of the water infrastructure should be planned in such a way that can be ensured mainly through return on investment, including investments from funds raised in the market. Experience shows that it is not possible to fully cover the costs of the activity of management organizations in the water sector at the expense of their own income.

State financing of the water sector in Turkmenistan is based on large-scale investment in major projects based on adopted programs, which include the construction of irrigation structures, reservoirs, the expansion of canal capacity, as well as machinery and technical equipment, and other required expenditure. At the same time, earthmoving equipment (bulldozers, excavators, dredgers, pumps, and so on) from foreign companies is purchased in large quantities; such equipment is used to keep up the operational maintenance of water management facilities. Therefore, most of the annual expenses of the State Committee on Water covers capital investments in fixed assets. For example, by the end of 2020, the total amount of capital investments in fixed assets was 316,951,500 manats (USD90,300), of which 256,673,200 manats (USD73,126) were the expenses for industrial purpose facilities.

The capital allocation from the state budget in Uzbekistan remains a major source of finance in the water sector. Although, it is very difficult to elaborate the exact sum spent from budgetary (and non-budgetary) State sources owing to the complexity of the public finance system and multilayer reporting practices; available data may shed some light on the current state of financing in the water

[1] For more information about budget programs, please read the national report for Kazakhstan in annex.

sector. Data from recent years reported by the World Bank suggests that, during 2016 to 2018, the budgetary allocation for irrigation and drainage works (including electricity costs) remained at around 3 trillion UZS to 4 trillion UZS per year (around USD35 per hectare). This is around 1.3 percent of national GDP and almost equal to the financing of research, healthcare, and other important sectors (Uzstat 2022).

Water sector financing has been dramatically reduced in all target countries starting in the wake of the collapse of the Soviet system. Reduction of financing for the water sector has been as much as 50 percent for Tajikistan and 28 percent for Uzbekistan. Most countries have introduced different types of payment for water delivery (services, water use, and so on). However, sustainable financing of the water sector was not achieved and the delayed O&M led to a serious deterioration of the water infrastructure (World Bank 2015).

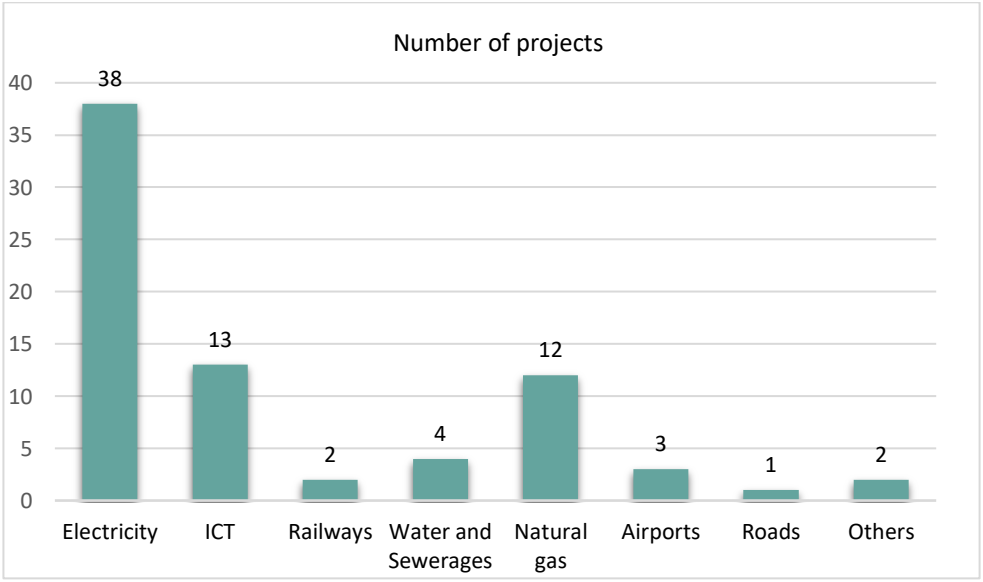
Investment projects with the participation of private capital in Central Asia between 1990 and 2021 was only at USD9.1 billion across 75 projects according to World Bank statistics (Table 4). Out of 75, only four projects were implemented in the water and sewerages sector, attracting USD160 million (Figures 1 and 2). Electricity outpaced the other sectors, attracting almost USD5.7 billion across 38 projects.

Table 4. Infrastructure projects with private capital participation in Central Asia, 1990-2021.

Country	Quantity of projects	Total investment (USD million)
Kazakhstan	50	5809
Kyrgyz Republic	6	140
Tajikistan	5	961
Turkmenistan	N/A	N/A
Uzbekistan	14	2811
Total	**75**	**9163**

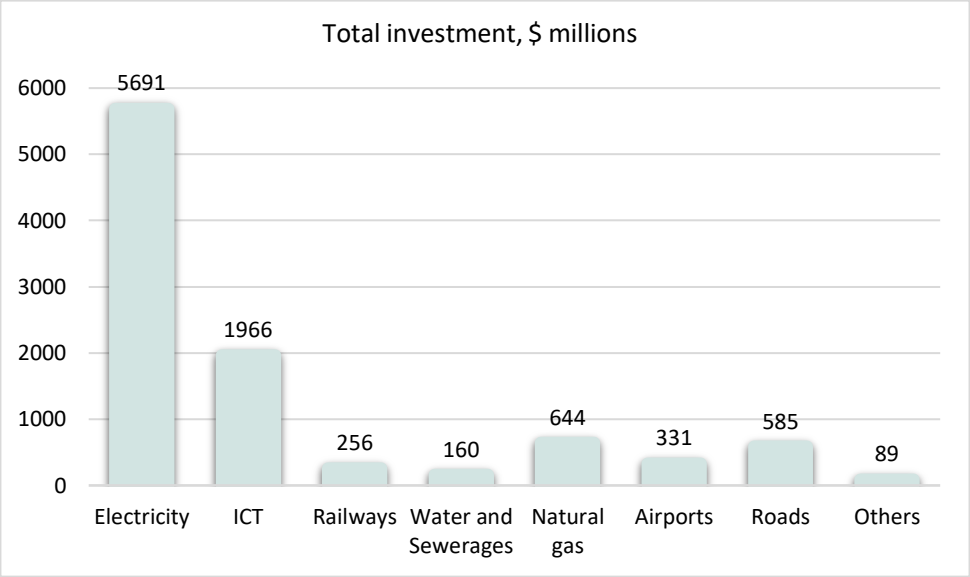
Source: The World Bank Private Participation in Infrastructure Database https://ppi.worldbank.org/en/ppi

Figure 1. Projects with private capital in Central Asia, by sector, 1990-2021.



Source: The World Bank Private Participation in Infrastructure Database https://ppi.worldbank.org/en/ppi

Figure 2. Total investment with private capital participation in Central Asia, by sector, 1990-2021.



Source: The World Bank Private Participation in Infrastructure Database https://ppi.worldbank.org/en/ppi

SECTION 2. WATER FINANCING CHALLENGES AND OPPORTUNITIES

Resource constraints usually spur innovations powerful enough to unlock new investments and prompt policies embracing new ways of financing for the sector. Yet, for water, arguably one of the most controlled and valuable resources, this is not the case. For all the emphasis Central Asian governments place on water security, it is still an undervalued and underinvested resource. While meeting competing demands for water is a considerable challenge, financing the water sector still lags behind the other sectors, which for a long time has not been a government priority.

After years of grappling with aging assets and backlogging financing for the water sector, governments now seem to have started paying due attention to the sector to unlock private capital and widespread awareness at an opportune moment for action. However, **to achieve safe, affordable, sufficient, and resilient water, the existing and new funds must be used wisely and consistently.** For this, it will be necessary to examine the existing and future potential challenges for mainstreaming financial resources to the sector.

If the previously mentioned business-as-usual trends are to continue, there will be little indication that the water sector will meet the growing water requirements implied by economic and population growth. Additionally, the impacts of climate change will further exacerbate the problem. With economic and social expectations rising in the growing economies of Central Asia, the countries of the region should rethink their approach to the water sector by taking stock of past mistakes and lessons for the future.

The water sector in Central Asia is hugely in need of investment; there is a constant low supply against increasingly high demand. Given this investment need and the economic potential of the countries, in the context of growing uncertainty owing to the impact of climate change, among other factors, the countries need to search for innovative approaches to source financing for sustainable water sector projects.

Private (or any other) capital in isolation cannot be a substitute for public funding and fully cover the needs, but unlocking capital can help governments to narrow the sector's largest investment gaps. Government institutions will always play a critical role in financing the water sector, while also addressing risk issues resulting from investments. As well as the pursuit of new technical solutions, new political and economic frameworks need to be designed to promote cooperation and integrated planning among sectors and regionally. Cross-sector cooperation and integrated planning will leverage possible synergies for decreasing costs, assessing trade-offs, demand-side interventions, and decentralized services to ensure infrastructure and sector sustainability (CAREC Institute, 2020). Therefore, international partners—international financial institutions (IFIs)—should continue supporting national reforms that are based on reform performance, not on request from line ministries.

One of the main challenges for the water sector of Central Asia is financial sustainability. Insufficient and shrinking financing has been a major obstacle to a sustainable and reliable water supply for all sectors in almost all countries. **Irregular financing also makes long-term planning impossible for the sector, leading to serious delays in O&M. Almost 70 percent of the infrastructure in irrigation and 50 percent of water supply systems are outdated and need rehabilitation or replacement (Grewal et al., 2022).** This scale of need makes the water sector most investment hungry. Therefore, governments have to introduce incentives in the sector, making it attractive to private and international investors.

It is crucial to pilot and help devise new approaches to financial sustainability in the water sector on multiple levels: basin, national, and regional. At regional level, a major focus could be on renewed discussions about setting up a water-energy consortium for Syr Daraya and Amu Darya. The joint operation of transboundary infrastructure, benefit-sharing schemes, and joint O&M of the water infrastructure could be focus areas of the project. In current small basins, PPP schemes on the operation of small and medium-size infrastructure could be tested. At national level, the focus could be on the provision of instruments on both a legal and financial basis for water sector financing from private sources.

Capacity building, education, and research in the water sector are weak areas in all countries where drastic reforms are required to improve the quality of both education and research. Countries need to finalize their reform efforts of public education, research, and the public services sectors. Without such drastic measures, the training of qualified experts for the water sector will remain a major problem. Online and web-based training (webinars) systems could be applied more and frequently. Support for curriculum and textbook development have to be viewed as potential areas of cooperation on a regional scale.

The new impetus on water and energy saving in the region has ushered in opportunities for improving the water sector. The increased competition for water and energy by the growing economy is a good incentive for water and energy savings in the water sector. Therefore, international projects could have a separate, technical intervention of piloting water-energy saving: pilot testing in selected basins the solar, wind, and other renewable energy for pumping water. Technology transfer and the facilitation of private financing to the water-saving support for drip irrigation dissemination are potential areas for the interventions. Regional exhibitions, forums, and expositions on water-energy saving technologies and technical solutions are also potential areas for further consideration.

However, these potential collaborative engagements should follow a specific planned framework approach coordinated at both regional and national level. Scattered and unplanned rehabilitation will not improve water distribution but will increase the differences between water users located in rehabilitated and unrehabilitated areas. Intervention should focus on helping national partners prepare long-term infrastructure rehabilitation plans. The plans could indicate priority and specific location-based improvement of the water infrastructure, with a clear indication of cost and finance sources. Such plans could be prepared for a ten-year period.

The same applies for the pilot basins and locations at local level. While investment in the water sector is poised to bring economic growth, social stability, and societal resilience—and these potential benefits are widely recognized—this has never been translated into investments at scale in Central Asia. This paradox is driven by multiple factors, including limited regional cooperation, many watersheds of the region being transboundary, the weak enabling institutional environment, and the lack of strategic planning owing to the limited widespread understanding of its value.

In this regard, there are several headwinds affecting the allocation of financing at scale that need due stakeholder consideration and can be categorized as follows: **limited regional cooperation; unavailable data and knowledge; and limited administrative and management capacity, and cross-stakeholder communication**.

LIMITED REGIONAL COOPERATION

As the main watersheds of the region are transboundary, regional cooperation has a critical role to play in managing water resources. Although the financial sustainability of the water sector is subject to the approach and policies of national government, it requires systematic, regular, and rule-based regional/transboundary water cooperation. On the one hand, there are crucial water infrastructures such as large scale, multipurpose, and multiseasonal water reservoirs; these regulating infrastructures are transboundary. Following independence, the changed ownership of these infrastructures made financing a serious problem. The Soviet Union constructed major dams and reservoirs in the Kyrgyz Republic and Tajikistan to store water primarily for summer release for irrigation in Uzbekistan, Kazakhstan, and Turkmenistan. As energy was cheap, hydropower generation was not a priority. Energy for upstream republics, which are poor in fossil fuel deposits, was imported from downstream neighbors under the control of central planning. However, this resource-sharing system collapsed in the wake of the Soviet Union's dissolution (Grewal et al., 2022, adelphi and Regional Environmental Centre for Central Asia 2017).

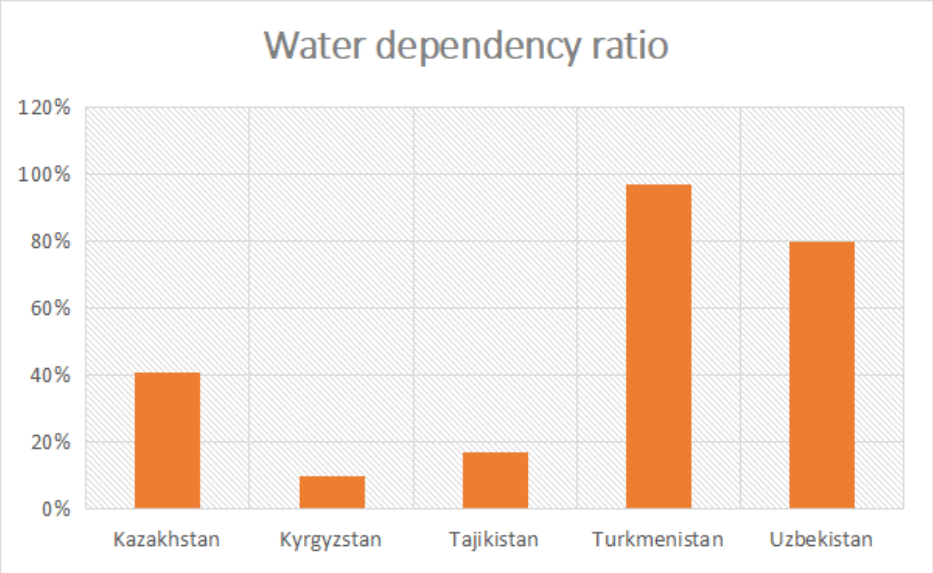
Since 1991, energy prices started to increase as high as global levels, and upstream states increased hydropower production with reservoir water releases mainly being driven by upstream winter electricity needs rather than downstream summer irrigation needs. This shift in water release patterns (from predominantly summer to increasingly winter releases) reduced availability of water for irrigation and caused uncontrolled winter flooding (adelphi and Regional Environmental Centre for Central Asia 2017).

Moreover, the regional collaboration is undermined due to the plans of upstream countries to expand their hydropower capacity by building new dams and enlarge their irrigated agriculture. These plans will modify release patterns and increase upstream control and consumption making downstream countries even more vulnerable to water scarcity. The reality is that the cofinancing of this large-scale infrastructure, and the development of investment plans for the joint construction and operation of a new joint transboundary infrastructure are prerequisites for sustainable development in Central Asia.

The dependency ratio attaches another significance to regional cooperation. Around 60 percent and 30 percent of available water resources in the region forms up in the territories of Tajikistan and the Kyrgyz Republic respectively. Turkmenistan has the highest dependency ratio in the region at around 95 percent, while Uzbekistan comes close with an 80 percent dependency ratio (Figure 3).

Differences in water management, water sector policies, and the absence of clear water allocation rules make water cooperation in the region very limited. Although, recent efforts to improve political relations among the member states have eased water-related tensions, the earlier aspects of water cooperation have still not been addressed. According to adelphi and Regional Environmental Centre for Central Asia (2017) the annual cost of limited cooperation in the water sector accounts for USD4.5 billion in the region. Increasingly, the cost of inaction or limited cooperation is multiplying owing to the exponential impact of climate change on water resources.

Figure 3. Water dependency ratio of Central Asian countries.



Source: CAREC Institute, 2022.

Demand for water will increase, as the availability of water resources declines and the important capacities of the water sector—such as infrastructure, human resources and knowledge—will also decline owing to the limited financing opportunities for the sector. In particular, the unclear role of regional institutions (IFAS, ICWC, BVOs) on water cooperation makes the process of water allocation a regular problem among member countries. No long-term arrangements, treaties, or similar conventions on water allocation exist among Central Asian countries. Therefore, ownership or the joint operation of infrastructure is possible, yet this would have to be explored from an institutional perspective first. Ad hoc or bilateral arrangements may address the issue of water allocation in the short term, but do not provide long-term solutions.

Box. Good Practice in the Management of Transboundary Water Resources: The Case Study of the Senegal River Basin Development Organization (OMVS)

Situation: Stretching for over 1800 kilometers from Guinea, Mali, Senegal and Mauritania, the Senegal River is the third longest in Africa. In a region plagued by poverty, water scarcity and under-development the Senegal River is a vital source of livelihood for local populations. With precipitation projections forecasting drier years in the future, countries along the river basin need to find a way to manage and protect the Senegal River's vital resources.

Solution: In 1972, the Senegal River Basin Development Organization was founded as a regional cooperative management body of the Senegal River representing Guinea, Mali, Mauritania and Senegal. The OMVS is recognized as one the best models of water cooperation because of its benefit-sharing regime. Under the OMVS legal framework, benefit sharing is directly linked to the statute of common infrastructures, and all member states share the benefits of common water installations. Benefit-sharing is organized on an equitable basis, which consists of matching investment costs with the direct benefits earned from water installations.

Financial arrangements also enshrine the principle of equity. Loans made to the organization for the construction and operations of common facilities are jointly guaranteed by OMVS Member states. The payments are allocated according to each country's participation in the costs and expenses of the facilities.

Contributions to the costs and expenses also determine the benefits which are withdrawn from common installations.

Outcome: The infrastructure that has been built and is managed by the OMVS generates 800 GWh per year of clean affordable energy and provides 375,000 hectares of potential irrigable lands. Despite geopolitical turmoil in the region, the OMVS has maintained operations and managed to facilitate benefits sharing of the Senegal River to all member states.

Source: Blue Peace Project of Swiss Agency for Development and Cooperation. https://www.thebluepeace.org/case-studies.html

INSTITUTIONAL LIMITATIONS

Since the start of the post-Soviet period, Central Asian countries have conducted a series of transformations in the water sector. Initially, the reforms targeted the re-establishment of the water sector after the immediate collapse of the Soviet system. They then switched the focus to replacing the former collective farm water systems. In the later stages, the water sector reforms focused on setting up basin level water management, thereby changing the legal and institutional aspects of the sector on a national level. Private sector participation is also part of the latest changes, yet with less clarity.

The private sector could be viewed as crucial, however, the risks associated with infrastructure investment and the low rate of return make private investors reluctant. Therefore, unlocking private investment requires innovative schemes to address concerns such as: improved PPP; financial guarantees; and/or utilization of the spillover effect of infrastructure by returning part of additional tax revenues to investors to increase the rate of return (Grewal et al., 2022, Taghizadeh-Hesary & Yoshino, 2019).

The spillover effect basically promotes scaling up financing of private investment through increasing the rate of return. As Yoshino et al. (2019) illustrated in the transport infrastructure case, construction of infrastructure, also can be applied in the water sector, unlocks opportunities for economic activities in the surroundings as a spillover effect. New businesses, such as restaurants, shops and other service-oriented economic activities that will open new employment opportunities can be launched. As explained by Grewal et al. (2022), economic impacts of water supply and sanitation can range from improving agricultural productivity in the region, inviting people to develop residential areas, opening new businesses along the water lines to launching manufacturing industries creating capital stock, and improving health conditions and quality of labor.

Hence, infrastructure capital, private capital, and labor relations increase GDP of a region in proximity to the infrastructure affecting overall regional development. Increased regional GDP bears corporate tax revenues, income tax revenues, land tax revenues, and so forth. The mobilization of private investment is therefore possible provided both governments and private investors increase their focus on infrastructure, while the former secures the investment environment by providing reasonably respected property rights and predictable factors affecting return on infrastructure (Walter, 2016).

Lack of private capital in infrastructure is also explained by poor governance, weak institutions, and limited understanding of investor needs (Grewal et al., 2022; ADB, 2017; Damania et al., 2019). A deep understanding of investor expectations, behavior, and motives is therefore a precondition to unlocking private investment. The level of commercial appeal of infrastructure projects to private

investors is a key element for successful PPP. Water financing and infrastructure development are core functions of the water ministries/agencies at national level.

Therefore, the effective functioning of the national water institutions is critical to the development of the sector in Central Asia. A serious aspect of institutional development is coordination among different state agencies, responsible for water governance and management. All countries of the region exhibit many institutional arrangements in the water sector (see Annexes for further details). Therefore, the implementation of water polices and setting up proper water management systems are key institutional development areas.

Currently, water sector reforms are in different stages of implementation across the countries of the region. These reforms target improved services, financial sustainability, and infrastructure development in the water sector. However, concerted efforts could currently be focused on financial sustainability owing both to urgency and the emergence of new financial schemes such as PPP, increasing scope for the private financing of water infrastructures. Therefore, reforms should provide legal scope for opportunities to utilize new financing mechanisms in the water sector. Tax laws, water laws, and other relevant legal instruments must include infrastructure ownership, renting, or other options for water infrastructure. Moreover, clear rules for private participation in water services must be established. Water, being a common shared resource in many instances (irrigation, recreation, and so on), requires stronger government regulations.

Water sector development requires a wide range of professionals with up-to-date knowledge and skills for all levels of water systems. At national level, the water sector is filled with qualified and skilled staff. However, at the basin and local levels there is a need for more trained and qualified staff. This knowledge gap is a very serious issue in the water sector of the countries of Central Asia.

LIMITED KNOWLEDGE

Water security is commonly and widely used in the region since the referencing of different aspects of water resources development in 1990. The different interpretations of water security leads to the over-securitization of water issues, thereby limiting cooperation opportunities for the development of water infrastructure in the region. The risks of water insecurity are not fully understood by stakeholders.

In fact, as in many other parts of the world, with regard to water resources in Central Asia economic data is insufficient, management is often hazy, and stakeholders are insufficiently involved. As a result, the countries of the region struggle to shape relevant, effective and fact-based water policies. Since investors lack a consistent basis and necessary up to date information for rational economic decision-making, water resources face inefficient allocation and poor investment patterns. Globally, even in some developed countries with robust water policies, there is still some way to go before the water sector is managed with a sufficient degree of sophistication. Therefore, without a significant improvement in water resources management, it will be very difficult to meet the related resource challenges, such as providing sufficient food or generating sustainable energy for the population (the 2030 Water Resources Group, 2009).

Limited understanding or knowledge of water-induced economic, social, and environmental risks can be another factor affecting financing for the sector. This is often because the risks of water insecurity are not fully understood by many stakeholders. Water stress is a risk multiplier, and it is a powerful risk with the potential to disrupt socioeconomic and ecological systems. Combined with other risks—

such as those related to augmenting climate change impacts, food and energy systems, and infrastructure challenges — it becomes detrimental.

Sustainable financing is necessary for long-term water security. According to ADB's assessment (2020), almost all Central Asian countries, although engaged in the water sector development efforts, are a long way off attaining sustainability in the water sector. This is particularly visible when compared with countries demonstrating highest water security in Asia as given in Table 5.

Table 5. Scores and National Water Security Index (NWSI) of Central Asian countries.

Country	KD1	KD2	KD3	KD4	KD5	NWSI score	NWSI
Scale	1-20	1-20	1-20	1-20	1-20	1-100	1-5
Kazakhstan	16	16.1	15.9	9.4	16.3	73.7	3
Kyrgyz Republic	13	10.8	16.2	15	17.6	72.6	3
Tajikistan	9	8.4	11.2	12.1	17.4	58.1	2
Turkmenistan	14	14.5	14.7	11.7	12.7	67.6	3
Uzbekistan	13	11.8	15.9	9.7	11.7	62.1	3
For comparing with high scoring countries of the Asia and the Pacific region							
Australia	19	15.7	17.6	15.4	20	87.8	4
Japan	19	14.3	18.5	16.5	19.6	87.9	4
New Zealand	20	14.9	19.4	14.7	20	89.1	4

Notes: KD is Key dimension. KD1 – Rural Household Water Security; KD2 – Economic Water Security; KD3 – Urban Water Security; KD4 – Environmental Water Security; KD5 – Water-Related Disaster Security. Source: ADB (2020).

Assessing the water sector through 5 key dimensions, the report findings indicate that while there is no Asian country with overall score 5, a model stage achieving water security, all Central Asian countries, except Tajikistan, scored 3. Scoring between 60 to 78, NWSI is at a capable stage in these countries, which means access to safe drinking water and sanitation facilities is improving, economic water security is moderate, environmental governance is moderate, though with clear pressure on the ecosystem and there are some institutional commitments to reduce disaster risk. Tajikistan scored 2, which means a significant majority of rural and urban households have access to basic water supply but less to sanitation, economic water security is low, environmental governance is moderate, with severe pressures on aquatic ecosystems, and progress in achieving disaster risk security is also low.

Considering augmenting climate change impact and growing population in the region, closing these gaps will be increasingly difficult unless the countries take immediate, regional and intersectoral actions. To realize them, these challenges have to be translated into opportunities and governments should foster collective responses. Some insights on how to unlock powerful movements in this regard are highlighted in the next section.

OPPORTUNITIES

Sustainable infrastructure can bring economic growth and reduce poverty through better connectivity, mobility, and business opportunities; however, this requires substantial financial

resources. The public sector has limited capacity to meet demand in Central Asia, but there are several constructive ways—yet unexplored in the region—to mobilize private sector investment.

One option for sustainable water financing is the commercialization of major water-use sector agriculture. If the land was privatized, agriculture production would be more market oriented and if the land was institutionalized, the involvement of private water companies would be feasible, at least at middle and local levels. Private financing for the water sector would start to become a reality. However, in the context of the Central Asian State system this is not a feasible option. Overall, globally, for various reasons this scheme is already facing serious socioeconomic resistance both from users and governments.

A more realistic approach for the region would be to introduce PPP schemes into irrigation services, utilizing multipurpose schemes for water use to cover the costs of water supply: concessions of infrastructure and land around the irrigation infrastructure, renting out facilities for private use will bring more finances to the water sector. The State could play the role of social regulator, ensuring that each water user receives a fair share of water resources. However, more financial control and regulations in this scheme are required to avoid corrupted schemes and malfunctioning water supply systems. To make this happen and ensure sustainable financing for the water sector, Central Asian governments must create a dedicated financing strategy for the sector considering current and future risks related to water availability, climate change, agriculture, land management, and so forth. One important aspect is unlocking water sector transformation through an integrated agenda for all relevant stakeholders.

Despite their similarities in resource management, the overall picture is complicated by the fact that the countries have distinct problems as well. Therefore, a detailed look into all five countries provides more insights into their financing challenges and opportunities. The next section, along with the Annexes, provides a glimpse of the status quo of water sector financing in the countries. However, despite the impediments, there are still some untapped opportunities for Central Asian governments that can create a disruptive and collaborative shift in investment and innovation in the water sector.

First and foremost, the region must define and measure the financing needs of the water sector in financial, technical, and industrial contexts to help all stakeholders and decision makers set priorities to prepare concrete intersectoral and intercountry investment propositions. The primary recommendation in this regard is to develop a framework and platform to assess these needs with the participation of relevant, knowledgeable, and experienced representatives of the countries.

There are some multilayer actions that are either untapped or not yet fully leveraged to improve the mobilization of finance on a larger scale in Central Asia and increase the productivity and efficiency of current water sector management. These are shown in Table 5.

Table 6. Multilayer actions that can stimulate additional financing for the water sector.

Regional level	• Effective regional agreements with clear mandate for each country • Concrete regional framework to regulate the compensating nature of regional water, energy, and food resources
Government level	• Effective national strategy for unlocking finance at scale and better cross-agency coordination

	• Adequate performance regulation and accountability mechanisms • Clarity of mandate and performance obligations of private sector service providers • A platform that provides appropriate analytical tools and transparent data to assess complex water-related investments, along with best practices from across the world
Business/service provider level	• Adequate pricing strategy • Minimized government interventions and operations based on market dynamics
Science and innovation	• The power of innovation and scientific solutions is not yet fully harnessed in Central Asia • Organization of targeted startup competitions and events
Societal/population level	• Change of mindset and increased understanding of the value of water by the public, including its benefits • Campaigns on social and other media to mainstream water as a vital resource for the population, businesses, and societies

Source: summarized by authors.

Realized successfully, these multilayer actions can create an environment for specific investment frameworks that can be applied by engaged stakeholders to upscale financing for the water sector.

FINANCING FRAMEWORKS

PRIVATE FINANCING INSTRUMENTS

Private financing is possible in Central Asia, particularly in irrigation infrastructure projects that enable agriculture value chains. The private investor has to be able to see a particular purpose and the financial benefits that come from financing an irrigation infrastructure. By connecting irrigation infrastructure purposes and agriculture producers, this mechanism could be realized. Certainly, it should be backed by concrete financial incentives, such as tax-efficient loans, higher rate return, and so on.

ENSURED EARNING SUPPORT FRAMEWORKS

Relevant to the previous point, if private financing is not possible at commercial rates or the project is hindered by an external complexity, guaranteed government support should be in place. Governments should be ready to provide policies to minimize risk and ensure returns by allocating state subsidies or tax exemption policies, particularly during the crisis period.

PUBLIC–PRIVATE PARTNERSHIPS

This is another means of mobilizing public and private finance support, based on a certain degree of government-ownership of assets. Compared with traditional schemes, PPPs show a significantly

increased level of private-sector capital participation affecting the efficiency and effectiveness of the project through its entire life cycle. While there is no officially recognized case in Central Asia, the region could apply this mechanism in irrigation projects. Depending on how risks can be shared between the private and public sector, this mechanism could involve all stages of development from build, to own, to operate.

MULTISTAKEHOLDER PARTNERSHIPS

Early engagement of all stakeholders—ranging from entrepreneurs, startups, researchers, to civil societies—and the wider public in financing project development helps to ensure bankable projects that can attract private capital. This participatory approach to developing projects can also stimulate better ideas of to unlock more financing sources for the sector.

UPSCALE PUBLIC FINANCING

By improving the understanding of the real value of water across public agencies, industries, businesses, and society in general, governments can upscale the financing rate for the water sector from the state budget. This will surely be a long-term and challenging process—as changing perceptions and mindsets across different dimensions requires time—that could ultimately affect resource allocation from diverse sectors of the economy.

PUBLIC EXPENDITURE REVIEW

As public spending is not as efficient as it might be, a spending review of the water supply and sanitation sector is an important step towards increasing the efficiency of current expenditure. A detailed budget spending review involving all sectors of the economy would enable the identification of projects with the highest potential economic value, while assessing the viability of resources spent. Also, this exercise helps expand awareness and understanding of water's economic value.

SECTION 3. SUMMARY OF NATIONAL REPORTS

This section features the findings of country analysis conducted by the national experts involved in the project and sheds light on the current state of water financing, including regulatory aspects. It contains short summaries of the country analysis. More details about each country are given in the Annexes to this report.

KAZAKHSTAN

Incomplete and aging water infrastructure constructed in the Soviet era faced growing challenges in the form of increasing consumption, leakages, water loss, and extreme weather events affecting water supply and quality across all countries of the region, including Kazakhstan. Although the water infrastructure in Kazakhstan is satisfactory, with water loss in some irrigation systems reaching about 40 percent. Since about half of surface runoff is formed in upstream countries, improving the efficiency of water use and decreasing water loss are crucial in Kazakhstan. The following are the main features of water resources financing in the country:

- About half of the ministry's budget was spent on strategic goal 3.2—improvement of water resources use efficiency in 2019 to 2021—with some fluctuations; the allocation for strategic goal 3.2 increased by 36 percent, from 68 billion tenge in 2021 to 108 billion tenge in 2022.
- The total budget for selected water sector targets and the infrastructure of three national projects in 2021 to 2025 is about 1.6 trillion tenge (approx., US $3.4 billion): about half of this budget will be funded from the republican budget, 12 percent from local budgets, and 37 percent from private investment. However, the sources of private investment are still unclear; therefore, the implementation of these national projects is at risk, especially under the current macroeconomic and political situation in the country and the world.
- Kazvodkhoz set a single water tariff for the whole country. However, this is not a rational tariff setting, especially when the country's regions/river basins vary significantly regarding hydrology, land, soil, climate conditions, and socioeconomic development.
- On average, water tariffs for regulated water supply through canals for all consumer groups increased by 43 percent for mechanized water supply systems and 39 percent for gravity water supply systems from 2018 to 2022. Water tariffs for farmers increased by 33 percent for gravity water supply systems, from 0.208 tenge/m^3 in 2018 to 0.626 tenge/m^3 in 2022.
- The cooperation of the European Bank for Reconstruction and Development (EBRD) with a private water utility operator in Shymkent, Vodnye Resursy Marketing, started in 2009 and can be considered a nationwide best practice for private capital engagement in the water sector.
- **Regulations in Kazakhstan allow private sector involvement, but PPP projects in the water sector are underdeveloped. Data on private-sector investments remains challenging to collect**; **hence, the data on private sector participation remains fragmented.** Private investors are not interested in the water sector because of its complex specificities related to ownership, management, and profitability.
- Since water is essentially a public commodity, water tariffs are politically and socially sensitive. The 'willingness to charge' in Kazakhstan is low because of social concerns in terms of the affordability of water services by the population.

Government funding to improve water services will continue to play a significant role for the foreseeable future because of social and political constraints regarding the affordability and accessibility of water to the population, especially for vulnerable groups, as the government is committed to achieving the SDGs. Therefore, public water sector funding should be strategically

targeted, and used effectively and efficiently. Water subsidies should be targeted and transparent—especially so when public funds are limited by budgetary constraints and multiple demands from other sectors.

Closing the financing gap in the water sector requires the government to mobilize public resources and expand opportunities for private capital participation. This can be done by (among other things) **reducing inefficiencies in O&M costs, increasing public funding, revising water tariffs, developing PPP projects by mobilizing commercial lenders, raising the creditworthiness of service providers, and mobilizing market-based repayable finance to address water infrastructure rehabilitation and construction costs.**

Greater attention is needed to **improve the enabling environment (policies, regulations, norms, transparency of processes)**, investing in the capacity of central, regional, and local governments to coordinate water policy and financial transfers, conduct pre-investment analysis of long-term capital investments, attract private investments in water infrastructure facilities, prevent corruption at any level and stage of implementation, and promote proper enforcement of laws.

KYRGYZ REPUBLIC

The Kyrgyz Republic is an upstream country, and its water resources are completely formed on its territory. Water resources are represented by river runoff, groundwater, and water accumulated in glaciers and lakes. Despite the availability of these water resources, a review of water sector indicators and research reports show that, in the face of climate change among other factors, the Kyrgyz Republic faces several challenges that have not been adequately addressed by existing resources and institutions, existing economic instruments, or revenues (charges) available to the sector.

The key challenges can be grouped as follows:

- **Insufficient water for some users, on the one hand, and inefficient use and/or underutilization of water resources, on the other hand (such as, underutilization of water for hydropower generation and thermal water);**
- Uncertainty about the availability of water resources in the future, associated with augmenting impacts of climate change (glacial retreat, changes in precipitation and runoff patterns, and so on);
- **Low-quality water services provided by the existing infrastructure** including low coverage and/or inefficient operation of existing water systems;
- **Lack of monitoring of water resources** (lack of gauging stations 'hydroposts,' especially automatic ones, as well as monitoring of groundwater levels and quality; lack of water quality analysis);
- High risks for population, property, and water infrastructure (such as irrigation and drinking water mains) associated with water-related natural hazards (mudflows and landslides, collapse of alpine lakes, groundwater flooding) and other natural phenomena (extreme temperatures and earthquakes);
- Subjective factors: the poor financial status of the water sector—for example, owing to low tariff rates in the irrigation sector, **up to 90 percent of O&M costs have been subsidized from the national budget**; owing to lack of maintenance and repairs, many water utilities (vodokanals) are effectively bankrupt;

- Structural (water institutions) and contextual complexity in water management (lengthy processes on the implementation/adoption of the Water Code and a lack of national water strategy);
- Low salaries and lack of qualified staff in the water sector.

Analysis of the legislation (Water Code, Water Users' Law, Law on Tariffication of Irrigation Water Supply Services and Law on Public Private Partnership) in terms of financing and current mechanisms of cost recovery of the water sector has shown that **there is a need to improve legislation in order to create economically sustainable policies in the irrigation sector (mainly at on-farm level) and favorable conditions (implementation of an adequate tariff policy that takes into account the interests of investors from the private sector) for attracting investments of the private sector to the water sector.**

The state budget of the Kyrgyz Republic and development institutions fund the Management, Operation and Maintenance (MOM) costs of off-farm level; funding the costs of MOM at on-farm level is split between the state budget and revenues collected from water users. **Allocations from the state budget are generally too low to ensure the physical sustainability of the infrastructure. Irrigation service fees collected from water users are insufficient to cover the MOM costs at on-farm level. Experts estimated that payments (ISF) received from water users covered only about 6 percent to 8 percent of MOM costs of the State budget.**

The fundamentals of national water policy as a framework and economic instruments for water resources management are stated in the Water Code. This ideology complies with the key principles of integrated water resources management. The two important institutions envisaged by the Water Code are: (i) **the National Water Council (NWC)** and (ii) **the State Water Administration (SWA).** The NWC, chaired by the Prime Minister, is responsible for water sector coordination, planning, and legislation. The SWA would assume responsibility for water resources management and the implementation of the Code, including the establishment of Basin Water Administration units and Basin Councils in each major river basin.

The instruments (see Annex 2) provided by the Water Code through these two institutions create ample opportunities to improve water resources management without major legislative change. However, in their existing form or state of implementation, these existing economic instruments neither create the right incentives (for pollution prevention, for the efficient use of water resources, and for efficient O&M of water systems), nor do they generate sufficient revenues for the financial viability of the water sector. Economic application mechanisms are insufficiently developed, and therefore have not been adopted, although the application of these tools would reduce the burden on the state budget and thus increase the autonomy of the sector.

TAJIKISTAN

Tajikistan attaches great importance to the development of the water sector at national, regional, and global levels. The country has introduced several global water initiatives and stands for the rational and efficient use of water resources. **Water is the main source for the acceleration of industrialization in the country, the achievement of energy and food security, as well as employment in rural areas of the country**, which are defined in the National Development Strategy of the Republic of Tajikistan for the period up to 2030.

Yet, for the rational and efficient use of water resources, the water sector needs sustainable financing. Lack of funding leads to the deterioration of the water infrastructure, which hinders the

achievement of the intended goals. In addition, water not only contributes to the economic growth of the country, but it also has a destructive power associated with the frequency of natural disasters. This has especially been observed in recent years with global climate change.

To improve the situation in the water sector, the Government of the Republic of Tajikistan adopted the Water Sector Reform Program for 2016 to 2025, as well as the revised legal acts, including the Water Code of the Republic of Tajikistan, dated 2 April 2020, No. 1688; the Law of the Republic of Tajikistan 'On Water Users Association,' dated 2 January 2020, No. 1668; the Law of the Republic of Tajikistan 'On Drinking Water Supply and Sanitation,' dated 19 July 2019, No. 1633; and so on, which regulate water relations in the water sector.

This reform is being implemented with the support of the Government of the Republic of Tajikistan and its development partners. To attract funds within the framework of the water sector reform, the program provides an action plan for the implementation of water sector reform for 2016 to 2025.

Funding for the implementation of approved activities is planned at the expense of the centralized republican budget and development partners. Unfortunately, financing of the action plan for the implementation of the reform is not provided at the expense of the private sector, although the private contribution of the sector plays an important role in the development of the water sector.

The investment policy in the water sector in Tajikistan is formed and implemented on the basis of the National Development Strategy of the Republic of Tajikistan for the period up to 2030, approved by the Majlisi Namoyandagon Majlisi Oli (the parliament) of the Republic of Tajikistan dated 1 December 2006, No. 636, and the Medium-Term Development Program of the Republic of Tajikistan for 2021 to 2026, approved by the Decree of the Government of the Republic of Tajikistan dated 30 April 2021, No. 168, as well as programs for the socioeconomic development of regions, cities, districts, industry strategies and programs.

To achieve the strategic development goals for the above documents, a public investment program is being developed on a five-year basis. For example, by the Decree of the Government of the Republic of Tajikistan, dated 2 September 2021, No. 358, the public investment program for 2021 to 2025 was adopted.

Within the framework of this investment program, the goals of the Government of the Republic of Tajikistan regarding the improvement of favorable conditions for investment activities and the private sector are taken into account. Increasing the participation of the private sector in sectors of the national economy contributes to the generation of income, the reduction of poverty, and the improvement of the wellbeing of the population.

At present, the main issue that needs to be addressed urgently is the creation of a sustainable economic mechanism for the functioning of the water sector system and its adaptation to the system of developing market relations in Tajikistan. In particular, this implies that the revenues of water management organizations from the provision of irrigation water supply and water diversion services in the long term should be sufficient to cover the costs of managing, operating and maintaining, restoring and replacing the worn-out water infrastructure.

TURKMENISTAN

Water resources are a fundamental element of the economic growth and wellbeing of Turkmenistan. The geographic location of the country, the climate peculiarities of the region and

water supply owing to transboundary river flow requires the rational use of water and maintaining a balance of its distribution between the sectors of the economy, social life, and ecosystems. Water resources provide water not only for the agriculture sector, but also for other sectors of the economy and the social sphere of the country. For this reason, water resources, their incoming flow volumes, use, distribution, and rational consumption are under special scrutiny by the government and define the nature of ongoing reforms (and consequently financing). The value of water as a national wealth and the requirements for its necessary rational use are enshrined in article 14 of the main law of the country—the Constitution of Turkmenistan.

The water resources of Turkmenistan are formed from the surface runoff of the Amu Darya, Murghab, Tejen, and Etrek rivers, small runoffs on the northeastern slopes of the Kopetdag, and minor volumes of underground and collected drainage water. The Amu Darya River provides 22 billion m^3 or 90 percent of the total volume of surface water resources. The remaining volume is provided by the Murghab River—1.631 billion m^3 (6.5 percent); the Tejen River—0.869 billion m^3 (3.5 percent); the Etrek, Sumbar and Chandyr Rivers—0.354 billion m^3 (1.4 percent); and other small rivers—0.15 billion m^3 (0.6 percent).

The water resources of Turkmenistan are used in full. At the same time, the country receives water resources mainly from transboundary watercourses according to the agreed water distribution quotas (also within the scope of the Interstate Commission for Water Coordination of International Fund for Saving the Aral Sea). Specifically, Turkmenistan is heavily dependent on water supply from the Amu Darya. In recent years, as a result of significant shrinkage of water content in other rivers supplying the country, more than 90 percent of the total surface runoff accounts for a more full-flowing Amu Darya River (in previous years the share was 88 percent). According to the 'Agreement between Turkmenistan and the Republic of Uzbekistan on cooperation over water management issues' valid since 1996, water allocation of the Amu Darya runoff (arranged at the shutter of the Kerki water measuring station) is carried out in equal shares—50 percent to 50 percent (22 km^3 on average). Of this volume, 12 km^3 to 13 km^3 are taken by the Karakum River (1,100 km long), and 3 km^3 to 5 km^3 and 4.5 km^3 to 7.5 km^3 by the irrigation systems of Lebap and Dashoguz regions respectively.

The average long-term volume of return waters is estimated at approximately 6 km^3 a year, of which the majority are collector-drainage waters. In total, industrial and municipal waste drains do not exceed 0.35 km^3 a year.

More than half a billion USD from the budget is spent annually to support the development of the environment, and various ecological and water projects. Despite the annual financing of operational costs of the country's water sector—including staff salaries, cost of fuel for operation of machinery (pumps, dredgers, earth movers), fuel for operation of production facilities, energy costs for utilities (heating, telephone services), raw materials, and other operational costs—the funds received are not sufficient to organize the productive activity of the sector.

As a result, the performance of water management organizations in implementing the plans and providing services is far from the expected level. Given the insignificant operating budget of the water management organizations, it is not possible to maintain the technical condition and carry out basic maintenance of equipment and water bodies on a regular basis. Only *ad hoc* maintenance works are carried out. As a result, mechanisms and machinery wear out quickly and the level of availability of water facilities decreases.

The state budget is the main (almost the only) source of financing and the receipts from agricultural producers (the dominant water users) cannot currently act as a sufficient and reliable source of financing. However, they can be seen as a promising source of financial allocations for O&M of the irrigation system.

An analysis of financial priorities can be conducted by virtue of the adopted, implemented, and ongoing state programs for financing the water sector of the country. The most important of these are as follows:

1. Program of the President of Turkmenistan on socioeconomic development of the country for 2022 to 2028.
2. Program of the President of Turkmenistan on the improvement of social and living conditions of the population in villages, towns, cities in etraps (districts), and etrap centers for 2022 to 2028.
3. Program of the President of Turkmenistan on socioeconomic development of the country for 2019 to 2025.
4. Program on the rational use of the water resources of Turkmenistan and increasing the throughput capacity of the Karakum River for 2015 to 2020.
5. General program on supplying settlements of the country with pure drinking water
6. Program on developing networks of facilities for water supply and sewerage in Ashgabat up to 2050.

The main priorities for financing the water sector are covered in the program of the President of Turkmenistan for the socioeconomic development of the country for 2022 to 2028. In terms of duration, it is a medium-term program and provides for large-scale tasks. **As already noted, for the period of the program, financial resources of more than 13.8 billion manats (approx., US $3.9 billion) are provided to develop and strengthen the water management infrastructure for the water sector. This is approximately over USD3.9 billion.**

Provided that 95 percent of available water resources are supplied from cross-border sources and the whole volume (year with average water availability) is fully consumed for utility needs, drinking water supply, and the economy of the country, further expansion of irrigated lands and development of the agricultural sector in general is possible by increasing efficiency of use and saving available water resources. The development of market relations, creation of husbandry farms, change of forms of ownership, and composition of consumers demanded new approaches in the improvement of the existing system of operating provision of the water economy—improvement of the whole package of services for consumers. This volume of maintenance (in full and to a high quality) is made possible by the development of the water infrastructure and its corresponding investment to save water and create water reserves, clean and transport them, as well as modernize irrigation and utility equipment.

Prioritizing investment opportunities for the development of the water economy is defined mainly by the current situation in Turkmenistan's irrigated agriculture. Irrigation and land-reclamation activities intended to improve the agricultural sectors are financed mainly by the government. Unless the options assuring land use and tangible benefits for a comparatively brief period are provided, farms and households—as well as other agricultural producers and communities—are unlikely to apply them on a wide scale. **Without the earning capacity of farming and the reliability of land ownership, they are unlikely to finance the water sector as required (and there will be no proper return from water investments).**

UZBEKISTAN

As the biggest consumer of water, the agriculture sector continues to play a vital role in the country's economy. According to 2020 estimates, the sector generated 27 percent of total GDP and is still the main source of income in rural areas.[2] Owing to the geographic and climatic conditions, Uzbekistan depends heavily on artificial irrigation, most of which dates back to Soviet times. This aging irrigation infrastructure is becoming more inefficient as its service life is overextended, resulting in worsening economic losses as time goes on.

Similar to many other sectors, the water sector has been subjected to ambitious 'strategy based' reforms in the recent years. **Legislative developments place emphasis on increasing efficiency in water use, implementing 'smart water' technologies and diversifying sources of finance for the O&M of the water infrastructure.** The latest amendments to the Law of the Republic of Uzbekistan 'On Water and Water Use' ('the Water Law') have facilitated water infrastructure to be transferred [to private entities] for operation on the principles of public–private partnership and other conditions in the manner prescribed by legislation. However, reservoirs, mudflow reservoirs, and other large water facilities with significant importance cannot be transferred to private party operation in accordance with the law.

Privatization of state-owned assets and new economic models for involving the private sector, such as PPP, have been instrumental in facilitating the private sector involvement in the economy. A notable development in the legislation in this regard was the adoption of the Law on Public–Private Partnerships in 2020 and its subsequent amendments ('PPP Law'). In line with changes in the Water Law and the Government's emphasis on the promotion of PPP in key public sectors of the economy, more than 100 PPP projects were concluded in the water sector during 2020 to 2021, with the total sum value nearly 722 billion UZS (or USD66 million).[3]

The water sector is also financed by water users (indirectly) through taxation for water use. In accordance with the Ministry of Finance, taxpayers paid 688 billion UZS (approx., US $60.6 million) in water use tax in 2021. The figure is expected to reach to 900 billion UZS (approx., US $79.3 million) for 2022, which is a 30 percent increase from previous year.[4] Today, agricultural water use is taxed at a rate of 40 UZS (approx., US $0.0035) per 1m^3 of water.[5]

However, capital deployment from the State budget remains a major source of funding in the water sector. As discussed earlier, during 2016 to 2018, the budgetary allocation for irrigation and drainage

[2] World Bank, 2021. 'Uzbekistan: Second Agricultural Public Expenditure Review,' p36. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/36561/Uzbekistan-Second-Agricultural-Public-Expenditure-Review.pdf

[3] PPP Development Agency under the Ministry of Finance of the Republic of Uzbekistan, Registry of PPP Projects. Retrieved from https://www.pppda.uz/reyestrga-olingan-loyihalar

[4] Accounts Chamber of the Republic of Uzbekistan, 2022. Conclusion of the Accounts Chamber of the Republic of Uzbekistan on the draft Law 'On the State Budget of the Republic of Uzbekistan for 2022' and the budgeting for 2022, p34. Retrieved from https://static.buhgalter.uz/Julia%20%20YASHINA/0f201f4b-3b58-cd8d-3e4b-a5b3e6666368.pdf

[5] Agricultural water use includes water use for irrigation of agricultural land and breeding (growing) of fish, including use by dekhkan farms, Article 445, Tax Code of the Republic of Uzbekistan, 30.12.2019. At: https://lex.uz/ru/docs/4674893

work remained at around 3 trillion UZS (approx., US $264.5 million) to 4 (approx., US $352.7 million) trillion UZS per year (around USD35 per hectare), or around 1.3 percent of national GDP. In comparison with the global average, this ratio is substantially high; but the actual sum is significantly less than that needed to run, maintain, and modernize the system, owing to the age of the infrastructure.

Loans from IFIs also play a major part in the infrastructure finance allocated to the water sector. From the available data on the Government portal, USD926.9 million is allocated to work on the water infrastructure from loans provided by IFIs during 2021 and in the first half of 2022.[6]

The Government places strong emphasis on introducing water saving and agricultural land efficiency technologies at field level. According to governmental data, in 2021 water-saving technologies were introduced on a land area of 433,000 hectares, and the overall rate of their implementation amounted to 17 percent of irrigated areas of the country.[7] Furthermore, in 2022 the Government plans to introduce i) drip irrigation systems on 230,000 hectares of land; ii) sprinkling irrigation systems on 28,000 hectares of land; iii) discrete irrigation systems on 2,000 hectares of land; and iv) to level sown areas with the help of laser equipment on 218,000 hectares of land.[8] In terms of state support measures, government data suggests that, in 2019 to 2021, a total of 1.2 trillion UZS were allocated from the state budget in subsidies to cover part of the costs of implementing water-saving technologies on 149,099 hectares of 5,835 agricultural producers.[9]

While the ban on privatization of water infrastructure (except for large and strategic infrastructures) has been removed from the Water Law, the practical implications of this approach need to be considered carefully. Water is a shared resource, and it is a political, social (and spiritual) concept. Privatizing the infrastructure that handles the shared resource for the common use may not go down well with the public. Alternatively, collective ownership through the Water Consumer Association (WCA) could be a viable option. WCA, being a legal entity, can own and manage a property. As a nongovernmental non-profit organization, WCA can be engaged in entrepreneurial activities provided the profit from such activities goes to support its main purpose and related activities. WCA ownership and self-funding (by WCA members) of water infrastructure would create a sense of collective responsibility and social justice. While economically WCA (and ultimately its members) may not be in a position to self-finance the construction and maintenance of water infrastructure, the Government could perhaps come up with economic models of (partially) supporting such financial models. The financing may also take place through microfinance loans funded by IFIs and coordinated by local commercial banks. The government may also coordinate capacity-building activities for WCA to enhance the financial, legal, and technical capacities related to this financing scheme.

[6] Ministry of Water Resources of the Republic of Uzbekistan. Retrieved from https://water.gov.uz/uz/page/1/6

[7] Decree of the President of the Republic of Uzbekistan dated 1 March 2022 N PP-144 'On measures to further improve the introduction of water-saving technologies in agriculture' at https://lex.uz/ru/pdfs/5884591

[8] Ibid, Section 2(a)

[9] Accounts Chamber of the Republic of Uzbekistan, 2021. Conclusion of the Accounts Chamber of the Republic of Uzbekistan on the draft Law 'On the State Budget of the Republic of Uzbekistan for 2022' and the budgeting for 2022, p53. Retrieved from https://static.buhgalter.uz/Julia%20%20YASHINA/0f201f4b-3b58-cd8d-3e4b-a5b3e6666368.pdf

In terms of legal framework, WCA's overall legal and institutional capacity allows it to borrow, own, and manage the water infrastructure. A government-level decree would suffice to further facilitate and accelerate these transformations.

PUBLIC-PRIVATE PARTNERSHIPS

As discussed earlier, PPP is one of the widely used buzzwords in legislative and policy documents, the implementation of which requires comprehensive capacity-building efforts both among public authorities and the private sector. It is difficult to create a financial model for water infrastructure PPP owing to inconsistency in water flows, which is an important element for calculating and generating investment returns. While the current tendency of PPP projects in the water sector involves mainly the exploitation of pump stations, there is insufficient data available in official government sources explaining the financial and risk allocation structures of such projects. One source claims that joint management agreements have been concluded between the government and the private sector in the example of the Bukhara Cotton Textile (BCT) cluster in Bukhara province. Accordingly, the state will deliver limited energy for the operation of the pump station and pay the pump operator salaries for the next ten years. If the energy exceeds the limit for the pump operation, the BCT cluster pays for the additional energy use coupled with the maintenance costs of the pump. The management and O&M costs of the pump station will be fully covered by the cluster after ten years. While this may not be an accurate example of the current PPP in Uzbekistan's water sector, if such transactions exist from the outset, they are far from how classical well-designed PPP are structured and implemented.

The government should develop comprehensive and detailed guidance setting out the potentially varied business models and a risk matrix that can be implemented for the water sector in general and in irrigation infrastructure in particular, while taking into account all the relevant factors. The government may also engage IFIs for particularly large infrastructure assets so that tailored project concepts can be developed. If correctly structured and implemented, PPP will serve as a viable alternative to public funding through the budget. The government, as a public duty guardian, will maintain both regulatory control and monitoring authority.

CLUSTERS

To some extent, clusters have already been engaged in water infrastructure financing, which has taken place by imposing investment obligations from the legislative act establishing the cluster. This can be enhanced depending on the size and investment potential of the cluster. For example, the Resolution of the Cabinet of Ministers No. 309, dated 7 June 2022, 'On measures to establish modern fruit and vegetable agro-industrial clusters in Namangan region' requires the Investor Limited Liability Company (LLC) 'Namangan sharbati', as part of the investment obligations, to dig wells and build a pumping station with the total value of works being at USD110,000. Further upscaling such practices may involve constructing and rehabilitating interfarm canals, drainage systems, and hydraulic systems. The primary beneficiary from these investments may be the clusters, but the improved and upgraded water infrastructure within the cluster boundary will have a positive impact on the overall functioning of the system, especially if the infrastructure passes through the cluster territories to neighboring farms/fields.

CONCLUSION AND POLICY RECOMMENDATIONS

Historically, human societies evolved around water. People lived close to rivers for domestic and agricultural water supplies. Today, the water infrastructure serves as a uniting factor for settlements. Expanding funding for the water sector by unlocking private investment contributes to the invigoration of economic activity and increases regional GDP. Yet, making a business out of developing, building, and improving the water infrastructure is not easy. As shown earlier, the legal-regulatory framework and political will in countries need further efforts to create an enabling environment for private capital participation in the water sector. More constructive engagement of governments into active and genuine dialog with all the relevant stakeholders can help to define the market for the participation of private players in the region's water economy.

Global experience shows that build–transfer–operate PPP arrangements can be more attractive for private investors. Their private sector role is crucial for economic development; however, the result depends on government ability to create a favorable environment with a clear mandate for investment. In this sense, PPP alone cannot be a 'silver bullet' for closing the investment gap in infrastructure, rather viable financing tools in the context of growing uncertainties owing to increasing climate change, technology disruption, and the unknown externalities of health-related pandemics, such as COVID-19.

The lack of private capital in infrastructure is often explained by poor governance, failed institutions, and a limited understanding of investor needs. A deep understanding of investor expectations, behavior, and motives is therefore a precondition to unlocking private investment into infrastructure. The mobilization of private investment can happen provided both governments and private investors increase their focus on infrastructure, with the former securing the investment environment by providing reasonable and respected property rights, and predictable factors affecting return on infrastructure.

However, sector-based, ill-coordinated planning and investment in Central Asian countries in the water sector will not provide alternative solutions for infrastructure financing. Instead, the economic frameworks that promote cooperation and integrated planning among sectors could provide a solution. **The approach should help to leverage possible synergies for decreasing costs, assessing trade-offs, demand-side interventions, and decentralized services to ensure the sustainability of the infrastructure. In this context, the state could play the role of social regulator, ensuring that each water user receives a fair share of water resources.**

PUBLIC–PRIVATE PARTNERSHIPS

Although PPP framework has been justified in many ways to stimulate private sector involvement in large infrastructure projects, the rationale as to why and how this can be practically implemented is unexplored in the context of Central Asia. Among key shortcomings are a low rate of return on investment; a weak oversight of public investment and engagement; and a lack of transparency and risk mitigation efforts. The effects of such circumstances increase the reluctance of the private sector *vis-à-vis* public infrastructure. Otherwise, appropriately regulated with full transparency and engagement, private investment can be unlocked through the PPP mechanism. The combination of public and private sector funds can have a leveraging effect and can chart a course towards achieving investment targets, provided both sides share an understanding of expectations.

Institutional infrastructure should come first, before anything else. Weak institutional infrastructure holds back any economic activity *vis-à-vis* infrastructure projects, which in turn limits opportunities for the private sector involvement. Governments need to rethink and reframe the regulatory frameworks necessary to create a supportive environment for private investors.

SPILLOVER TAX REVENUES

This is about unlocking commercially attractive financial returns to private investors, which can be successful in a well-implemented PPP framework. Spillover tax revenues usually go to the government. If half of this revenue were to return to investors, this might increase private investment in sustainable infrastructure.

These two approaches (PPPs and spillover tax revenues) —along with well-integrated, cross-cutting matters such as sustainability, good governance to mitigate associated risks, and education—are believed to unlock private investment in water infrastructure. Delivered and resourced accordingly through established favorable regulatory frameworks and adjusted to the contextual characteristics of each Central Asian country, the highlighted mechanisms can ensure the participation of private investors in water infrastructure projects.

POLICY RECOMMENDATIONS

The analysis presented in this report shows that unlocking financing for the water sector requires concerted multistakeholder action on multiple fronts. The countries, first, have to be able to get the best use from the existing water assets and the funding available for the sector, and strengthen the enabling environment for diverse investments; and second, mobilize financing from various public and private sources, and pursue strategic planning by developing a dedicated financing strategy. What follows is a set of suggestions as to how to mainstream these approaches.

- **Strategic planning and proper management are a critical component of the enabling environment for investments. Clearly identified priorities with well-articulated, long-term plans and strategies with open data and information should be documented**. As part of governance, the government has to be able to monitor the quantity and quality of water, and practically possess law enforcement capacity to manage water resources across all industries. This paves firm avenues for cooperation between the government and private investors. The information should concretely highlight the engagement format of the government with private stakeholders. This way, private investors can acquire understanding of government priorities and look for the best ways to get involved. **The improvement of data quality can help generate better public policies on water sector financing. Insufficient accurate data is a strong impediment to effective policymaking and discourages investors.**
- **Governments in Central Asia should change their agriculture policies,** more market-oriented, deregulated policies may generate the interest of private companies to invest in water services. For water supply companies, operating and maintaining irrigation infrastructure may be a solution to water sector financing. Yet, a more realistic approach would be to introduce PPP schemes to irrigation services. The state may currently allow only water service delivery and O&M functions to be entrusted to private companies, retaining ownership of infrastructure within the state assets.

- Another area of focus is **setting up more multipurpose water schemes** in irrigated areas. Concessions of infrastructure and land around the irrigation infrastructure and renting out facilities to private users will bring more financial capital to the water sector.
- Raising the profile of water resources management on the political and developmental agendas of national governments is an essential step. Central Asian governments should strengthen their capacities to engage in setting policies and making investments in support of infrastructure for water management. **Substantial financial support should be mobilized from public and private funds and coordination between the relevant government ministries must be improved.**
- **Establishing a functional PPP mechanism;** applying fundamental principles of interaction between the government and private investor; understanding expectations, motives, and behaviors of either side *vis-à-vis* infrastructure assets can make a difference for Central Asian economies. A robust policy on risk allocation and management should be integral to this. Increased spillover tax revenues in the long-term, following the construction of an infrastructure, and their distribution need to be revisited by governments. Part of the spillover tax revenue should be returned to investors—a process which needs to be backed by a regulatory framework.
- It is important to launch transboundary infrastructures with the support of all relevant stakeholders. Joint financing and the operation of transboundary infrastructure can open opportunities for intercountry business activities in the reciprocity of benefit-sharing schemes. **Major focus could be given to renewed discussions on setting up a water-energy consortium** for the Syr Darya and Amu Darya. Joint O&M of transboundary infrastructure, and benefit-sharing schemes of the water infrastructure could be parts of the project. In current small basins, PPP schemes for operating small and medium-size infrastructure could be tested.

ANNEXES

National Report—Kazakhstan

National Report—Kyrgyz Republic

National Report—Tajikistan

National Report—Turkmenistan

National Report—Uzbekistan

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Water Sector Financing in the Republic of Kazakhstan

By Aliya Assubayeva

Table of Contents

TABLES, FIGURES, AND BOXES

ABBREVIATIONS

BP	Budget programs
PPP	Public Private Partnership
EBRD	European Bank for Reconstruction and Development

EXECUTIVE SUMMARY

Achieving universal access to safe and affordable drinking water along with adequate sanitation (Sustainable Development Goal 6) is critical for improving people's well-being, environmental sustainability, and economic development. Incomplete and aging water infrastructure constructed in the Soviet time faced growing challenges in the form of increasing consumption, leakages, water losses, and extreme weather events affecting water supply and quality. Water infrastructure in Kazakhstan is satisfactory, with water losses in some irrigation systems reaching about 40% (footnote 20). Since about half of surface runoff is formed in upstream countries, improving the efficiency of water use and decreasing water losses are crucial in Kazakhstan.

This paper reviews the current situation of water sector financing by analyzing the budget of the Ministry of Ecology, Geology, and Natural Resources in 2019-2024 because the Committee for Water Resources is responsible for water policy formulation and implementation countrywide, including water usage, water resources allocation, and water supply, exploring national projects with a focus on the water sector and infrastructure targets, reviewing tariffs for water services (irrigation, drinking water, wastewater), scanning for PPP projects in the water sector of Kazakhstan, and reviewing of legal, organizational and governance provisions of water sector financing. The paper revealed the following findings:

- About half of the Ministry's budget was spent on strategic goal 3.2, improvement of water resources use efficiency in 2019-2021, with some fluctuations; the allocation for strategic goal 3.2 increased by 36%, specifically from 68 billion tenge in 2021 to 108 billion tenge in 2022 (see details in Section 1).
- The total budget for selected targets in the water sector and infrastructure of three national projects in 2021-2025 is about 1.6 trillion tenge: about half of this budget will be funded from the republican budget, 12% from local budgets, and 37% from private investments. However, the sources of private investments are still unclear; hence, implementing these national projects is at risk, especially under the current macroeconomic and political situation in the country and the world.
- Kazvodkhoz set a single water tariff for the whole country. However, this is not a rational tariff setting, especially when the country's regions/river basins vary significantly regarding hydrological, land, soil, climate conditions, and socio-economic development.
- On average, water tariffs for regulated water supply through canals for all consumer groups increased by 43% for mechanized water supply systems and 39% for gravity water supply systems from 2018 to 2022. Water tariffs for farmers increased by 33% for gravity water supply systems from 0.208 tenge/m^3 in 2018 to 0.626 tenge/m^3 in 2022.
- The cooperation of EBDR with private water utility operator in Shymkent - Vodnye Resursy Marketing started in 2009 and can be considered a nationwide best practice.
- Regulations in Kazakhstan allow private sector involvement, but PPP projects in the water sector are underdeveloped. Data on private-sector investments remains challenging to collect; hence, data on private sector participation remains fragmented. The private investors are not interested in the water sector because of its specificities (see details in Section 1).
- Since water is an essential public good, water tariffs are politically and socially sensitive. The "willingness to charge" in Kazakhstan is low because of social concerns in terms of the affordability of water services by the population.

Private sector financing cannot substitute public funding, but unlocking it can help governments narrow the sector's largest investment gaps. Government funding to improve water services will continue to play a significant role for the foreseeable future because of social and political constraints regarding the affordability and accessibility of water to the population, especially for vulnerable groups, as the government is committed to achieving the SDGs. Therefore, public water sector funding should be strategically targeted, effectively, and efficiently used. Water subsidies should be targeted and transparent, mainly when public funds are limited by budgetary constraints and multiple demands from other sectors.

Closing the financing gap in the water sector requires the government to mobilize public resources and expand opportunities for private investment. This can be done by, amongst others, reducing operating and maintenance costs inefficiencies, increasing public funding, revising water tariffs, developing PPP projects by mobilizing commercial lenders, raising the creditworthiness of service providers, and mobilizing market-based repayable finance to address water infrastructure rehabilitation and construction costs. Greater attention is needed to improve enabling environment (policies, regulations, norms, transparency of processes), investing in the capacity of central, regional, and local governments to coordinate water policy and financial transfers, conduct pre-investment analysis of long-term capital investments, attract private investments in water infrastructure facilities, prevent corruption at any level and stage of implementation, and promote proper enforcement of laws.

SECTION 1 ASSESSMENT OF WATER SECTOR FINANCING

Revision of annual budget allocation for water sector financing

According to the Budget Code (2008)[1], the budgets are approved and implemented in the Republic of Kazakhstan at different levels: the republican budget, the regional budget, budgets of the city of republican significance, the capital city, district (city of regional significance) budget, budgets of the city of district significance, a village, a township, a rural district (Chapter 2, Article 6). This report analyzes the republican budget for water sector financing with a focus on the Ministry of Ecology, Geology, and Natural Resources budget because of the Committee for Water Resources (hereinafter the Committee) responsible for water policy formulation and implementation, including water usage, water resources protection, and water supply nationwide.

The Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan (hereinafter the Ministry) was established by Decree of the President of the Republic of Kazakhstan No. 17 "On further improvement of the public administration system of the Republic of Kazakhstan" on 17 June 2019[2]. The Ministry has three key directions that were transferred from other ministries. Indicatively, environmental regulation and waste management were transferred from the Ministry of Energy, water resources management, forestry and fishery from the Ministry of Agriculture, and geological survey from the Ministry of Industry and Infrastructure Development.

The Ministry's development plan for 2020-2024[3] was approved on 13 January 2020, but several changes have been made since then. According to the development plan 2020-2024, the Ministry has three strategic areas: 1) improving environmental quality, 2) improving geological exploration of the territory and replenishing the mineral resource complex, and 3) ensuring the protection, reproduction, and rational use of flora and fauna, special protected natural areas (including strategic goal 3.2 "Improvement of water resources use efficiency"). The Ministry was responsible for implementing 16 budget programs in 2019, 18 budget programs in 2020, and 20 budget programs in 2021[4]. Table 2 presents the budgeting programs of the Ministry from the republican budget for 2019-2021, including the implementation of strategic goal 3.2. In 2019 about 56% of the Ministry's budget was spent on goal 3.2, while in 2020 and 2021, about 51% was spent on goal 3.2.

Strategic goal 3.2 "Improvement of water resources use efficiency" consists of one macro-indicator on water losses reduction in main and distribution canals and four target indicators: restoration of irrigation infrastructure of irrigated lands, flooding risk reduction, increase of uninterrupted drinking water supply, and implementation of the Irrigation and Drainage Improvement Project 2. Table 1 presents the performance on achieving target indicators in

[1] Budget Code of the Republic of Kazakhstan dated 4 December 2008 No. 95-IV, https://adilet.zan.kz/rus/docs/K080000095_

[2] Decree of the President of the Republic of Kazakhstan No. 17 "On further improvement of the public administration system of the Republic of Kazakhstan", 17 June 2019, https://adilet.zan.kz/rus/docs/U190000017U

[3] The development plan of the Ministry of ecology, geology, and natural resources of the republic of Kazakhstan for 2020-2024, https://online.zakon.kz/Document/?doc_id=33260335&pos=5;-106#pos=5;-106

[4] Analytical information of the Ministry of Ecology, Geology and Natural resources of the Republic of Kazakhstan on the implementation of strategic goals and achievement of target indicators linked with budgetary funds for 2019, 2020, 2021, https://budget.egov.kz

2019-2021. Indicatively, the land area with the restoration of irrigation infrastructure increased from 1546 thousand hectares in 2019 to 1678.8 thousand hectares in 2021. Flooding risk reduction was conducted in 6 settlements in 2019, one settlement in 2020, and one settlement in 2021. The number of settlements connected to group water networks of republican significance increased from 21 in 2019 to 655 in 2021. According to the plan of the Irrigation and Drainage Improvement Project 2, the volume of work on the layout of the bottom, slopes, dam, crest of canals, and collectors for the entire period of the project is 43.5 million m^2, where 75% of the work was completed by the end of 2021.

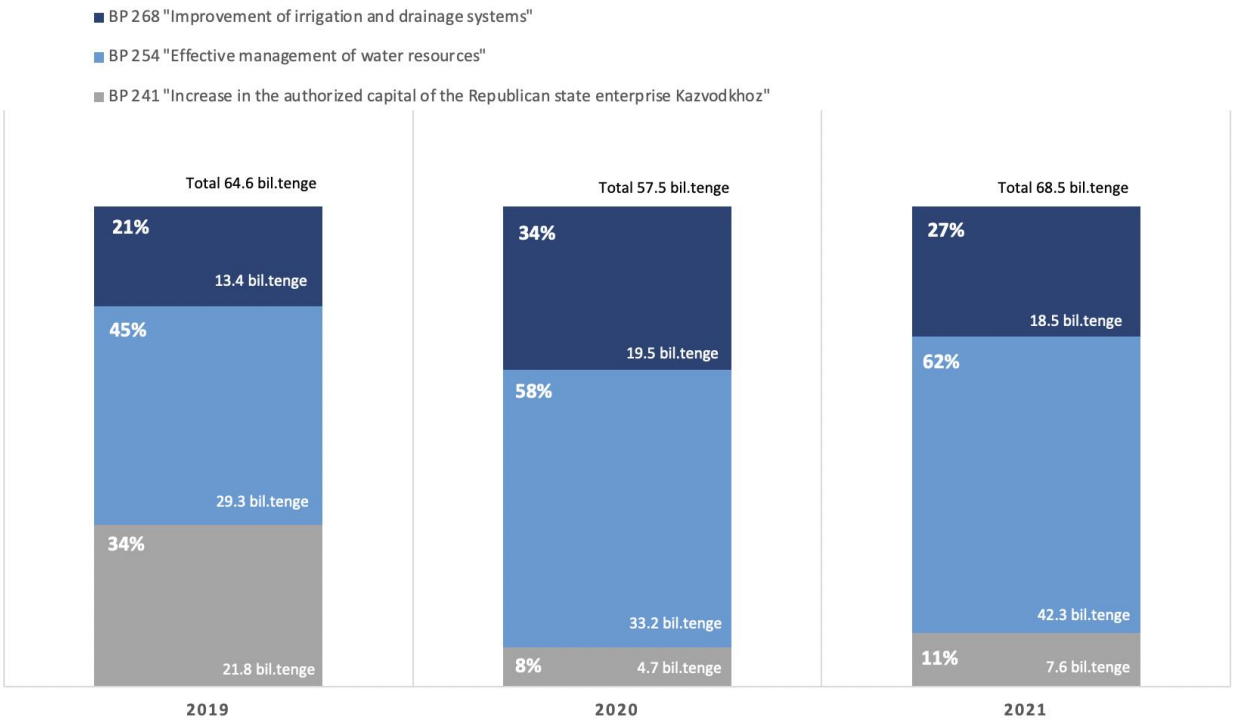
Table 1 Target indicators of strategic goal 3.2 in 2019-2021

Target indicator	**2019**		**2020**		**2021**	
	plan	*fact*	*plan*	*fact*	*plan*	*fact*
Land area with regular irrigation (thousand hectares)	1604	1546	1761	1599.3	1685	1678.8
Flooding risk reduction (number of settlements)	6	6	1	1	1	1
Uninterrupted drinking water supply (number of settlements)	21	21	631	631	655	655
The volume of work performed (%) under the concluded contracts of the Irrigation and Drainage Improvement Project 2	9.4	9.4	40	40	75	75

Source: Analytical information of the Ministry of Ecology, Geology and Natural resources of the Republic of Kazakhstan on the implementation of strategic goals and achievement of target indicators linked with budgetary funds for 2019, 2020, and 2021, https://budget.egov.kz

The implementation of strategic goal 3.2 was conducted mainly within three key budget programs (hereafter BP): BP 241 “Increase in the authorized capital of the Republican state enterprise Kazvodkhoz,” BP 254 “Effective management of water resources,” and BP 268 “Improvement of irrigation and drainage systems.” Figure 1 presents the budget allocation among three budget programs. The budget allocation for BP 254 increased from 29.3 billion tenge or 45% in 2019 to 33.2 billion tenge or 62% in 2021. While the budget allocation for BP 241 decreased from 34% in 2019 to 11% in 2021. The budget allocation for BP 268 varied: 21% in 2019, 34% in 2020, and 27% in 2021.

Figure 1 Budget allocation among key budget programs of strategic goal 3.2 in 2019-2021



Source: author's calculation based on information from the republican budget 2019-2021

Some budget programs consist of several subprograms. Table 2 lists subprograms of BP 254 and BP 268. For example, the budget allocation for BP 254 remained at approximately the same level, about 29 billion tenge in 2019 – 2021, with seven subprograms (100, 101, 102, 103, 105, 113, 115). There are fluctuations in budget allocation for subprograms; however, budget cuts for subprograms 101, 113, and 115 can be observed. If about 38% of BP 254 was spent on subprogram 101, "Operation of transboundary and republican water facilities, not related to water supply, and monitoring of their technical condition," in 2021 it was only 24%. About 28% of BP 254 was invested in subprogram 113 "Construction and reconstruction of water supply systems, hydraulic structures," which declined to 18% in 2021. Overall, BP 254 increased in 2020 only because of subprogram 106, which "Targeted current transfers to the budget of the Turkestan region for the overhaul of water bodies in the field of water management." Meanwhile, BP 254 increased in 2021 because of targeted transfers from the National Fund of the Republic of Kazakhstan (116, 117, 118, 119, 120). BP 268 is designed to improve water supply and reclamation of irrigated lands by investing in the reconstruction of aging irrigation and drainage systems. Figure 1 shows that budget allocation for BP 268 increased from 21% to 27% from the budget of strategic goal 3.2. However, Table 2 reveals that the proportion of 30% from subprogram 004 "From External Loans" and 70% from subprogram 016 "Co-financing of External Loans from the Republican Budget" remained in 2019-2021.

In addition to three core BPs aiming to achieve strategic goal 3.2, there are also budget programs designed to solve other tasks defined by the regulation of the Ministry, including BP 267 and BP 131, partially related to water resources management. Table 2 shows the budget allocation for BP 267 aimed at implementing scientific and technical programs to ensure the conservation of forests, increase their sustainability, and improve the efficiency of water management and fisheries. However, in 2019-2020 two research projects on water resources

were financed, particularly 31% of BP 267, and in 2021 none. Namely, in 2019-2020 Kazakh Research Institute of Water Economy conducted a "Scientific and technological justification for the rational use of water resources with an increase of regular and estuary irrigation areas in all river basins of the Republic of Kazakhstan until 2021" with the budget of 220 million tenge and National Engineering Academy of the Republic of Kazakhstan conducted "Development of an integrated water resources management system of the Republic of Kazakhstan in consideration the natural, climatic and socio-economic conditions of the region" with the budget of 75.3 million tenge. Core financing of the Kazakh Research Institute of Water Economy was conducted from BP 131 "Ensuring basic financing of subjects of scientific and (or) technical activities" in 2020-2021 because only in 2020 the institute was transferred from the assets of the National Agrarian Science Educational Center of the Ministry of Agriculture to the Ministry of Ecology, Geology, and Natural Resources[5].

There are also distributed budget programs BP 101 from the Ministry of Foreign Affairs and BP 105 from the Ministry of National Economy. BP 101 covers expenses for representation purposes of official delegations abroad as well as events with the participation of foreign delegations such as meetings, seminars, and official events. For example, in 2019, BP 101 was allocated for organizing 13 international events, 12 of which were working group meetings on transboundary rivers. While in 2021, only two international events related to transboundary water resources were covered by BP 101 because of COVID-19 travel restrictions. Table 2 presents high variability in budget allocation for BP 105. In 2019 three feasibility studies on the construction of hydraulic structures were conducted by funds BP 105. Whereas 158.9 million tenge were allocated for implementing BP 105 in 2020, only 15.1% were used for developing a feasibility study on constructing eight reservoirs. The main reason for budget failure is related to the late allocation of funds, late tender procedures and the signing of contracts, and the refusal of tender winners to conclude contracts. In 2021, BP 105 was spent on developing a feasibility study for budget investment projects to construct four new reservoirs.

Furthermore, funds from the reserve of the government were allocated for urgent expenses (BP 109, BP 133). The budget of BP 133 was transferred in 2020 to the akimat of the Turkestan region for development for the construction of the reservoir "Kensai-Koskorgan-2" and in 2021 to the akimat of the Akmola region to carry out work on dredging, to straighten, and to widen the Yesil riverbed. Funding for BP 109 has increased by 23% from 2019 to 2021. In 2019 about 77% of the budget of BP 109 was allocated to cover the services of electricity exchange with the Kyrgyz Republic and Republic of Tajikistan and 23% for reconstruction and restoration of hydraulic structures. In 2020 95% of BP 109 funding was allocated to cover the services of electricity exchange with the Kyrgyz Republic and 5% to cover the services of electricity exchange with the Republic of Tajikistan. In 2021, BP 109 was allocated to cover the services of electricity exchange with the Kyrgyz Republic. The analysis revealed that payment for water supply to the Kyrgyz Republic almost doubled in 2021 compared with 2019.

[5] Decree of the Government of the Republic of Kazakhstan dated 8 September 2020 No. 558 On the acceptance of a share in the authorized capital of limited liability partnerships "Kazakh Research Institute of Water Economy" and "Scientific and Production Center for Fisheries" from private ownership to republican ownership under a donation agreement, https://adilet.zan.kz/rus/docs/P2000000558

Table 2 Budget programs of the Ministry of Ecology, Geology, and Natural Resources with a focus on water sector financing in 2019-2021

Budget item/ thousand tenge	**2019**		**2020**		**2021**	
	plan	fact	plan	fact	plan	fact
Budget programs (BP) of the Ministry	115 406 300.8	115 302 102.3	114 632 955.5	114 429 897 .5	135 388 751.6	134 337 337 .2
STRATEGIC GOAL 3.2 IMPROVEMENT OF WATER RESOURCES USE EFFICIENCY	**64 690 795**	**64 656 885.1**	**57 657 129**	**57 590 312.3**	**69 434 735**	**68 529 836.7**
BP 241 "Increase in the authorized capital of the Republican state enterprise Kazvodkhoz"	*21 851 515*	*21 851 513.4*	*4 713 826*	*4 713 826*	*7 661 707*	*7 661 707*
BP 254 "Effective management of water resources"	*29 371 661*	*29 344 632.9*	*33 282 896*	*33 277 655,6*	*43 236 510*	*42 345 973.8*
100 "Provision of regulatory and methodological documentation in the field of water management"	41 169	41 168,6	53 815	53 814.5	44 588	44 587.5
101 "Operation of transboundary and republican water facilities, not related to water supply, and monitoring of their technical condition"	11 150 381. 1	11 150 381. 1	11 121 670. 6	11 121 670. 1	10 034 806.4	10 034 806.3
102 "Conducting environmental releases"	3 233 848.7	3 233 848.7	3 942 415	3 942 414.2	3 470 383.6	3 470 383.6
103 "Protection and rational use of water resources"	281 460.2	275 552.65	667 709.7	662 476.8	391 390	391 389.4
105 "Organization of cooperation with neighboring states on the regulation of water relations, rational use, and protection of transboundary waters"	151 629	151 628.5	90 621.7	90 621.7	77 363	77 363
106 "Targeted current transfers to the budget of the Turkestan region for the overhaul of water bodies in the field of water management"	-	-	4 000 000	4 000 000	4 768 746	4 768 746
113 "Construction and reconstruction of water supply systems, hydraulic structures"	8 302 763	8 281 643.4	7 972 703	7 972 697.3	7 672 025	7 634 893.3
115 "Targeted transfers to regional budgets, budgets of cities of republican significance, and the capital to increase the water availability of surface water resources"	6 210 410	6 210 410	5 433 961	5 433 961	3 289 103	3 289 103
116 "Operation of technical conditions of transboundary and republican water facilities, not related to water supply and monitoring, through a	-	-	-	-	2 215 000	2 206 968

targeted transfer from the National Fund of the Republic of Kazakhstan"						
117 "Conducting environmental releases at the expense of a targeted transfer from the National Fund of the Republic of Kazakhstan"	-	-	-	-	1 878 651	1 878 651
118 "Targeted current transfers to the budget of the Turkestan region for the overhaul of water facilities in the field of water management through a targeted transfer from the National Fund of the Republic of Kazakhstan"	-	-	-	-	1 500 000	1 500 000
119 "Construction and reconstruction of water supply systems and hydraulic structures at the expense of a targeted transfer from the National Fund of the Republic of Kazakhstan"	-	-	-	-	5 750 681	4 905 309.7
120 "Targeted transfers for development to regional budgets, budgets of cities of republican significance, and the capital to increase the water availability of surface water resources through a targeted transfer from the National Fund of the Republic of Kazakhstan"	-	-	-	-	2 143 773	2 143 773
BP 268 "Improvement of irrigation and drainage systems"	*13 467 619*	*13 460 738.8*	*19 660 407*	*19 598 830.7*	*18 536 518*	*18 522 155.9*
004 "From external loans"	4 040 287	4 040 538.7	5 954 295	5 897 694.5	5 560 955	5 559 553
016 "Co-financing of external loans from the republican budget"	9 427 332	9 420 200	13 706 112	13 701 136. 2	12 975 563	12 962 602.9
BUDGET PROGRAMS AIMED AT SOLVING OTHER TASKS DEFINED BY THE REGULATION OF THE MINISTRY						
BP 267 "Improving the availability of knowledge and research"	472 65	472 657	472 183	472 183	3 021 066	3 021 063.6
- Research projects on water resources management	147 657	147 657	147 657	147 657	0	0
BP 131 "Ensuring basic financing of subjects of scientific and (or) technical activities"	-	-	740 564	740 564	817 199	817 199
- Kazakh Research Institute of Water Economy	-	-	12 233	12 233	40 777	40 777

DISTRIBUTED BUDGET PROGRAMS						
BP 101 "Conducting events at the expense of funds for representation costs"	10617.9	10 617.4	0	0	1 264	1 264
BP 105 "Development or adjustment, as well as conducting feasibility studies of budget investment projects and tender documentation for public-private partnership projects, concession projects, advisory support for public-private partnership projects, and concession projects"	3 802	3 546.9	158 879	24 047.4	40 852	40 852
FUNDS ALLOCATED FROM THE RESERVE OF THE GOVERNMENT FOR URGENT EXPENSES						
BP 109 "Carrying out activities at the expense of the reserve of the Government of the Republic of Kazakhstan for urgent costs"	1 652 430.1	1 609 437.3	1 510 831.1	1 510 831	2 144 044.4	2 144 044.4
- To the Kyrgyz Republic for water supply transfer		1 176 744.4		1 435 988.9		2 144 044.4
BP 133 "Targeted transfers for development of other levels of government for carrying out activities at the expense of the reserve of the Government of the Republic of Kazakhstan for urgent costs"	0	0	1 130 868.4	1 130 868.4	3 143 748	3 143 748

Source: author's calculation based on the Ministry's reports of budget execution in 2019-2022

Analysis of sectoral and sub-sectoral financing priorities in 2022-2024

The Law on Republican budget in 2022-2024 was approved on 2 December 2021 and adjusted on 12 May 2022 due to changes in Kazakhstan's socio-economic development forecast for 2022. According to the Budget Code (2008), the estimates of budget parameters for the second and third years of the planning period are indicative. They can be refined following the forecast of socio-economic development, budget monitoring and evaluation of results, and other internal and external factors (Chapter 11, Article 61).

According to Table 3, about 58% of the Ministry's budget is allocated for strategic goal 3.2, "Improvement of water resources use efficiency" (with three key budget programs 241, 254, 268) in 2022; whereas it is tentatively 46% in 2023 and 36% in 2024. The budget of strategic goal 3.2 increased by 36%, specifically from 68 billion tenge in 2021 to 108 billion tenge in 2022. Figure 2 compares budget allocation among key budget programs of strategic goal 3.2 in 2021-2022.

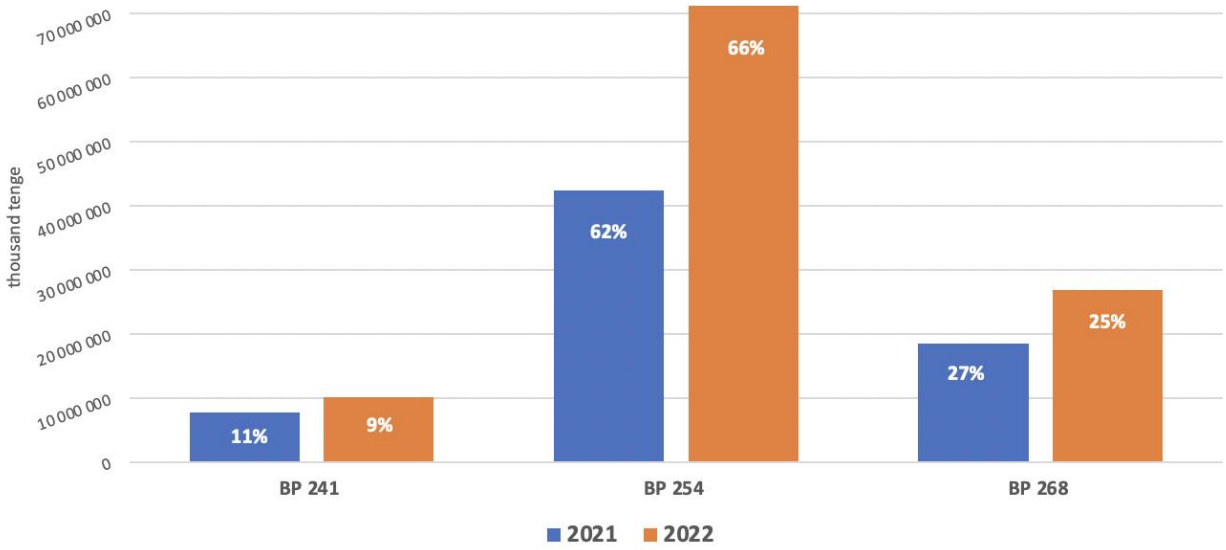
BP 241 "Increase in the authorized capital of the Republican state enterprise Kazvodkhoz" increased from 42.3 billion tenge (or 62% of total budget) in 2021 to 71.1 billion tenge (or 66% of total budget) in 2022. BP 254 and BP 268 increased in absolute terms in 2022 but constituted less proportion of the total budget of strategic goal 3.2. The target areas of BP 241 include the restoration of emergency reservoirs and hydraulic structures to ensure their safe operation and achieve and maintain an environmentally safe and economically optimal level of water use to preserve and improve the population's living conditions and the environment.

Table 3 Budget programs of the Ministry with focus on water sector financing in 2022-2024

Budget item/ thousand tenge	**2022**	**2023**	**2024**
	plan	plan	plan
Budgeting programs (BP) of the Ministry	**185 963 746**	**72 812 939**	**38 987 663**
STRATEGIC GOAL 3.2 IMPROVEMENT OF WATER RESOURCES USE EFFICIENCY	***108 050 945***	***33 511 026***	***13 966 000***
BP 241 "Increase in the authorized capital of the Republican state enterprise Kazvodkhoz"	10 082 508	-	-
BP 254 "Effective management of water resources"	71 147 101	13 200 026	13 966 000
BP 268 "Improvement of irrigation and drainage systems"	26 821 336	20 311 000	0

Source: Planned budget according to the Law of the Republic of Kazakhstan dated 2 December 2021, No. 77 On Republican budget in 2022-2024, https://adilet.zan.kz/rus/docs/Z2100000077

Figure 2 Comparison of budget allocation for strategic goal 3.2 in 2021-2022



Source: author's calculation based on information from the republican budget 2019-2021 and 2022-2024. Note: percentages mean the proportion of the budget of strategic goal 3.2

Table 4 summarizes target indicators of strategic goal 3.2 in 2022-2024 from proposals on BP 241, BP 254, and BP 268, which the Ministry uploaded on the website https://budget.egov.kz. The Ministry plans to increase the land area with regular irrigation from 1765 thousand hectares in 2022 to 2021 thousand hectares in 2024. Data about the number of settlements with flooding risk reduction is not available, and the number of territories with uninterrupted drinking water supply remains without changes. Furthermore, the Ministry aims to implement 80% of the work of the Irrigation and Drainage Improvement Project 2 in 2022-2023.

Table 4 Target indicators of strategic goal 3.2 in 2022-2024

Target indicator	**2022**	**2023**	**2024**
	plan	plan	plan
Land area with regular irrigation (thousand hectares)	1765	1877	2021
Flooding risk reduction (number of settlements)	-	-	-
Uninterrupted drinking water supply (number of settlements)	655	656	656
The level of work performed (%) under the concluded contracts of the Irrigation and Drainage Improvement Project 2	80	80	-

Source: authors' excerpts from proposals of BP 241, 254, 268 for 2022-2024, https://budget.egov.kz

Review of national projects in Kazakhstan

President Kassym-Jomart Tokayev suggested transitioning from state programs to national projects in 2020. Ten national projects[6] for 2021-2025 were approved in October 2021. The total budget of ten national projects is 49 trillion tenge, where 67% of the budget is assumed to be financed through private investments. Among ten national projects, three address water resources management and water infrastructure: Zhasyl Kazakstan (or Green Kazakhstan), Strong Regions - the Driver of the Country's Development, and Development of the agro-industrial complex for 2021-2025. Table 5 summarizes three national projects' vital indicators related to the water sector and budget sources.

The national project "Green Kazakhstan"[7] is developed by the Ministry of Ecology, Geology and Natural Resources for 2021-2025 with a total budget of 1.4 billion tenge to address environmental challenges, including ecosystem conservation of the Balkhash Lake and the North Aral Sea, restoration of four lakes, reduction of water losses in irrigation by 4 km^3, reduction in freshwater intake in the industry by 1.3 km^3, and additional water storage with a volume of 1.7 km^3 in South Kazakhstan. To improve water use productivity, water infrastructure investments will finance the reconstruction of 7 467.51 km of irrigation canals, digitalization of 212 channels, the construction of 9 new reservoirs, and other water infrastructure.

The national project "Strong Regions - the Driver of the Country's Development" is designed to ensure equal access to essential services and transport connectivity of the country, both between regions and within regions, including rehabilitation and construction of water supply and sewerage networks[8]. The Ministry of National Economy developed the national project with a total budget of 7.6 trillion tenge. The primary sources of investment in water supply and wastewater treatment facilities are the republican budget, local budgets, and private investments. One of the national project's key objectives for developing the agro-industrial complex for 2021-2025 is the widespread introduction of water-saving technologies (up to 450 thousand hectares by 2025), improvement of water supply subsidization, and construction of the plant to produce modern irrigation systems[9].

According to Table 5, the total budget for selected targets in the water sector and infrastructure is about 1.6 trillion tenge. Almost half of this budget will be funded from the republican budget, 12% from local budgets, and 37% from private investments. However, the sources of private investments are still unclear; hence, implementing these national projects is at risk, especially under the current macroeconomic and political situation in the country and the world. Furthermore, different ministries, state agencies, akimats, and the private sector will implement the national

[6] National projects: https://primeminister.kz/ru/documents/national-projects

[7] Decree of the Government of the Republic of Kazakhstan dated October 12, 2021 No. 731 On approval of the national project "Green Kazakhstan", https://adilet.zan.kz/rus/docs/P2100000731

[8] Decree of the Government of the Republic of Kazakhstan dated October 12, 2021 No. 729 On approval of the national project "Strong regions - the driver of the country's development", https://adilet.zan.kz/rus/docs/P2100000729

[9] Decree of the Government of the Republic of Kazakhstan dated 12 October 2021 No. 732 On approval of the national project for the development of the agro-industrial complex of the Republic of Kazakhstan for 2021-2025, https://adilet.zan.kz/rus/docs/P2100000732

projects. In this regard, poor cross-sectoral communication, coordination, and collaboration among stakeholders can be potential obstacles to implementing national projects.

Table 5 Summary of key indicators related to the water sector in three national projects

	2021	2022	2023	2024	2025	Total funding	Republican budget	Local budgets	Private investment
	Indicators						*Thousand tenge*		
GREEN KAZAKHSTAN									
Water inflow into Lake Balkhash is at least 12 km³/year	12	12	12	12	12	22 285 100	17 109 700	4 925 400	250 000
Increase in the water volume of the North Aral Sea by 35% (km³)	20.6	21.2	22	24	27	41144 000	39 085 000	1 500 000	559 000
Restoration of 4 lakes	-	1	-	-	3	28 578 556	28 239 356	339 200	-
Reduction of water losses in irrigation by 4 km³	0.2	0.8	0.5	2.7	4	428 687 969	150 554 103	24 074 166	254 059 700
Reduction in freshwater intake in the industry by 1.3 km³	5.6	5.2	4.8	4.6	4.4	-	-	-	-
Additional water storage with a volume of 1.7 km³	-	-	1.3	1.6	1.7	48 884 629	48 884 629	-	-
STRONG REGIONS - THE DRIVER OF THE COUNTRY'S DEVELOPMENT									
Ensuring access of the population to water supply services (million)	18.2	18.6	19	19.4	19.8	635 614 220.8	510 345 802	125 268 418.8	-
Wastewater treatment level (%) in cities	74.9	77.5	79.7	90	100	362 046 810	16 600 000	15 428 000	330 018 810
DEVELOPMENT OF THE AGRO-INDUSTRIAL COMPLEX FOR 2021-2025									

Land area with the use of water-saving technologies (drip irrigation, sprinkling) (thousand ha)	230	265	300	373	450	16 425 063	-		16 425 063	
TOTAL						1 583 666 347.8	810 590	818	187 960 247.8	584 887 510

Source: author's calculation based on publicly available data about national projects

Review water services, providing mechanisms and price formation

Tariffs for water supply services

Companies providing services of regulated water supply through canals belong to natural monopolies, and tariff policy is regulated and approved by the Department of the Committee for the Regulation of Natural Monopolies of the Ministry of National Economy[10]. The republican state enterprise on the right of economic management "Kazvodkhoz" (hereafter Kazvodkhoz) is a subsidiary company of the Committee for Water Resources of the Ministry of Ecology, Geology and Natural Resources, which is responsible for the operation, maintenance, and safety of water facilities of republican significance, the supply of irrigation and drinking water. Kazvodkhoz has 20 branches in all regions of Kazakhstan. The main activities of Kazvodkhoz consist of the maintenance, operation, repair, and restoration work of hydraulic structures, reservoirs, water pipelines, and other water management facilities. Furthermore, water supply through canals is one of the key responsibilities of Kazvodkhoz. The operation of Kazvodkhoz is funded by the republican budget (budget program 241), local budgets, and water tariffs. However, the republican budget for the reconstruction of water infrastructure has not been sufficient; therefore, loans were borrowed from international financial institutions: European Bank for Reconstruction and Development (EBRD), Islamic Development Bank, and World Bank.

According to the Law of Natural Monopolies (2018), tariffs for regulated water supply through canals are differentiated on technological features of water supply (mechanized and gravity) and the purpose of water use (Paragraph 2, Section 1, Article 261). Tariffs are differentiated among five consumer groups: 1) agricultural commodity producers, 2) water utilities and budget organizations, 3) electricity generating companies, 4) releases (environmental, sanitary, and epidemiological), and 5) industrial enterprises other commercial and non-commercial organizations (Paragraph 2, Section 1, Article 262). Tariffs for each consumer group are determined based on the estimated tariff adjusted for the correction factor (Paragraph 2, Section 1, Article 263).

According to Kazvodkhoz, tariffs are insufficient to cover water supply systems' operation and maintenance costs for irrigation. Tariffs represent only a tiny part of the production costs of agricultural commodities, which do not stimulate the efficient use of water resources. The latest changes in tariffs for regulated water supply through canals were made following order No. 74-OD dated 19 July 2021 of the Department of the Committee for the Regulation of Natural Monopolies of the Ministry of National Economy of the Republic of Kazakhstan. There is a single water tariff for Kazakhstan. However, this is not a rational tariff setting, especially when the country's territory is big and regions/river basins vary significantly in terms of hydrological, land, and climate conditions and socio-economic development.

Table 6 presents five-year water tariffs differentiated by consumer groups and water supply methods. As was mentioned, there are five groups of water consumers and two water supply

[10] Law of the Republic of Kazakhstan dated 27 December 2018 No. 204-VI On Natural Monopolies (as amended and supplemented as of March 2, 2022), https://online.zakon.kz/Document/?doc_id=38681059&pos=3;-106#pos=3;-106

methods. On average, water tariffs for all consumer groups increased 43% for mechanized water supply systems and 39% for gravity water supply systems from 2018 to 2022 (except for farmers). Water tariffs for farmers increased by 33% for gravity water supply systems from 0.208 tenge/m^3 in 2018 to 0.626 tenge/m^3 in 2022. Kazvodkhoz signs contracts with farmers about water use plans at the beginning of the vegetation period. All tariffs in Table 5 are mentioned without VAT.

Table 6 Kazvodkhoz's water tariffs differentiated by consumer groups and water supply methods

Consumer groups	**1.08.2018-31.07.2019**	**1.08.2019-31.07.2020**	**1.08.2020-31.07.2021**	**1.08.2021-31.07.2022**	**1.08.2022-31.07.2023**
					tenge/m^3 (without VAT)
Agricultural commodity producers					
Mechanized water supply system	11.385	16.081	20.566	23.668	26.223
Gravity water supply system	0.208	0.294	0.660	0.636	0.626
Water utilities, budget organizations					
Mechanized water supply system	8.928	12.611	16.129	18.561	20.565
Gravity water supply system	0.308	0.435	0.627	0.690	0.786
Electricity generating companies					
Mechanized water supply system	19.623	27.717	35.449	40.794	45.199
Gravity water supply system	0.161	0.227	0.327	0.360	0.410
Releases					
Mechanized water supply system	13.74	19.407	24.480	28.571	31.650
Gravity water supply system	0.317	0.448	0.646	0.712	0.810
Industrial enterprises, other commercial and non-profit organizations					
Mechanized water supply system	28.154	39.766	50.857	58.527	64.846
Gravity water supply system	2.127	3.005	4.330	4.770	5.434

Source: translated from Attachment 2 of Order No. 74-OD dated 19 July 2021 of the Department of the Committee for the Regulation of Natural Monopolies of the Ministry of National Economy of the Republic of Kazakhstan

The government subsidizes water tariffs, which causes negative incentives for farmers to use water resources ineffectively. Local executive bodies (akimats) allocate water tariff subsidies among farmers. According to rules for subsidizing the cost of services for water supply to agricultural producers[11], 50% of the water tariff for farmers with rice crops is subsidized. For other farmers, subsidies are differentiated depending on 1 m^3/water regardless of irrigation methods and water supply. For example, 60% of water tariff is subsidized from 0.4 to 2 tenge/$m^{3,}$ and 85% of tariff is supported for water tariff over 20 tenge/m^3. However, these water subsidies are more beneficial for large-scale farmers than for small-scale farmers.

[11] Order of the Minister of Agriculture of the Republic of Kazakhstan dated 30 June 2015 No. 6-3/597 On approval of the Rules for subsidizing the cost of services for the supply of water to agricultural producers, https://adilet.zan.kz/rus/docs/V1500012714

In June 2022, the Ministry of Agriculture suggested changes in the subsidization of water tariffs[12]. Indicatively, subsidy for 1 m^3 of irrigation water from surface irrigation for rice crops is 50%, for other crops - 40%, for perennial fodder crops cultivated using a firth irrigation system with mechanized water lifting in Atyrau, Aktobe, and West Kazakhstan regions - 85%. Subsidy for irrigation water is differentiated depending on the use of water-saving technologies regardless of water supply. It varies from 60% if the water tariff is below 2 tenge/m^3 to 85% if it is over 20 tenge/m^3.

In addition to water supply subsidies, farmers in irrigated agriculture receive state support through subsidies for seeds, mineral fertilizers, herbicides, fuel, and concessional loans. For example, farmers can apply for partial reimbursement costs for the purchase of crop seeds from 50% to 70%, for fertilizer subsidies both at the total cost (100%) and at a reduced cost (50%), for subsidizing the cost of pesticides, bioagents (entomophagy) both at the total cost (100%) and reduced cost (50%). The process of subsidizing crop production is automated and carried out through the subsidizing information system on the https://qoldau.kz web portal. Irrigated agriculture remains one of the leading water users. In Kazakhstan, the area of irrigated land is 1.6 million hectares, with plans to increase to 2.2 million hectares by 2025. However, degradation of irrigation and drainage systems and deterioration of the ecological and reclamation state of lands is one obstacle to increasing the efficiency of irrigated agriculture.

Tariffs for drinking water supply and wastewater services

The drinking water supply in Kazakhstan is at a satisfactory level. In 2020, 95% of the population had access to at least basic drinking water services, while 89% had access to safely managed drinking water services[13] (World Bank, 2022). However, water supply and wastewater treatment infrastructure are deteriorating. According to EBRD (2018), "*on average, 60 % of the country's water supply and 70 % of its wastewater disposal systems are aging and need a replacement*" (p.4). The deterioration rate varies a lot among cities. Box 1 lists challenges in the water utilities sector in Kazakhstan and some policy recommendations.

[12] First draft of On amendments and additions to the order of the Minister of Agriculture of the Republic of Kazakhstan dated 30 June 2015 No. 6-3 / 597, https://legalacts.egov.kz/npa/view?id=14121815

[13] Drinking water ladder (https://washdata.org/monitoring/drinking-water):

- *Safely managed* - drinking water from an improved water source that is accessible on premises, available when needed and free from faecal and priority chemical contamination.
- *Basic* - drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing.

Box 1 Challenges of water utility sector in Kazakhstan

Challenges of water supply and wastewater disposal sector in Kazakhstan are following:

- Deterioration of assets
- Network water losses
- High levels of power consumption
- Occurrence of faults
- Availability of high-quality potable water
- Cold water metering
- Wastewater treatment

The institutional and regulatory challenges facing the public utilities sector are as follows:

- A lack of corporate development strategies
- Need for corporate restructuring
- Low tariffs do not guarantee modernization of systems
- Poor financial performance
- Lack of commercial funding
- Lack of interaction with key stakeholders

According to EBRD (2018) report, international best practice to enhance water supply and wastewater services includes measure to invest in utility infrastructure, restructure utility firms, refine tariff regulations, introduce incentive-based contracting using key performance indicators, and improve collaboration between utility firms and consumers, as well as other stakeholders.

Source: EBRD (2018), pp.4-10

Companies providing services of water supply and wastewater belong to natural monopolies, and utility tariff policy is regulated and approved by the Department of the Committee for the Regulation of Natural Monopolies of the Ministry of National Economy (footnote 11). According to Article 28 of the Water Code (2003), drinking water supply systems may be in republican, communal property, as well as the property of individuals and legal entities. State organizations operate the drinking water supply systems owned by the republic, and the state and other organizations operate drinking water supply systems in communal ownership. Separate drinking water supply systems may be part of housing condominiums. The central executive body (akimat) is an authorized body in the field of public utilities, including water supply and sanitation. Most of the water supply and wastewater disposal utilities are state-owned. The republican budget allocates budget for utility development in regional budgets.

Consumers are divided into three groups to differentiate the tariff for regulated water supply and wastewater services: population (or residential), organizations maintained at the expense of

budgetary funds, and other consumers[14]. Tariffs for the population are kept low to ensure affordability; however, it varies from region to region. The tariff for regulated services for water supply through main pipelines is differentiated by consumer groups considering the level of solvency of the population of the corresponding region, the volume of consumption; the impact on inflation; and the level of development of industrial production in the region[15]. Furthermore, the water supply tariff depends on many factors, including the availability of central water supply, organization of the water supply system (availability of water sources and main networks), investments in public utilities, the balance sheet of the public utilities, availability of consumer metering devices and other.

Tariffs for water supply and wastewater services vary a lot among regions. Table 7 presents the latest tariffs for water supply and wastewater services in Kazakhstan in selected eight cities for comparison (dated July 2022). Several cities (Nur-Sultan, Almaty, Kostanay, Ust-Kamenogorsk) have similar consumer groups such as population, budget organizations, and other consumers. Whereas in Aktau, there is one tariff for all consumers. In contrast, seven groups exist in Shymkent and eight groups of consumers in Karaganda. In seven out of eight cities, tariffs for drinking water supply and wastewater disposal and treatment were updated in 2022, specifically from July 2022, due to the expiration of the moratorium on tariffs for regulated utilities (water supply, sanitation, heat supply, gas supply, and electricity supply) from January to July 2022. While in Almaty, tariffs for drinking water supply and wastewater disposal and treatment were approved in 2020 and remained the same for five years. Meanwhile, in Atyrau, the cost of a cubic meter of water and wastewater services decreased from May 2022 to September 2023. In Kostanay, water tariffs were approved in June 2022 for five years with a gradual increase in the cost of a cubic meter of water for the population from 72.05 tenge/m^3 in 2022 to 112.32 tenge/m^3 in 2026; at the same time, with gradual reduction of the cost of a cubic meter of water for budget organizations from 2 609.11 tenge/m^3 in 2022 to 515.78 tenge/m^3 in 2026[16].

According to Table 7, the cost of a cubic meter of water for the population varies from 48 tenge/m^3 in Almaty to 108.33 tenge/m^3 in Karaganda. Meanwhile, the cost of wastewater disposal and treatment services for the population ranges from 25.87 tenge/m^3 in Almaty to 98.03 tenge/m^3 in Karaganda. The highest tariffs for water and wastewater services among different groups are set for budget organizations. For example, the cost of a cubic meter of water for budget organizations ranges from 161.31 tenge/m^3 in Almaty to 2 609.11 tenge/m^3 in Kostanay. As was mentioned earlier, in Aktay, there is only one tariff for water and wastewater disposal for all consumers. In Atyrau, there are only two groups of consumers (population and other consumers).

[14] Order of the Minister of National Economy of the Republic of Kazakhstan dated 19 November 2019 No. 90. Registered with the Ministry of Justice of the Republic of Kazakhstan on November 20, 2019 No. 19617 On approval of the Tariff Formation Rules (Paragraph 2, Section 1, Article 247), https://adilet.zan.kz/rus/docs/V1900019617

[15] Order of the Minister of National Economy of the Republic of Kazakhstan dated November 19, 2019 No. 90. Registered with the Ministry of Justice of the Republic of Kazakhstan on November 20, 2019 No. 19617 On approval of the Tariff Formation Rules (Paragraph 2, Section 1, Article 254), https://adilet.zan.kz/rus/docs/V1900019617

[16] Water utility tariffs in Kostanay for 2022-2026, https://kostanay-su.kz/tarify/ (last accessed on 11 July 2022)

Table 7 Tariffs for water supply and wastewater services in Kazakhstan (in selected cities)

City/ Company	Group of consumers	Tariffs with VAT, tenge/m^3		Note: tariff cap period
		Drinking water supply	Wastewater disposal	
Nur-Sultan Astana Su Arnasy	I- population	56.29	43.9	01.07.2022 – 31.12.2022
	II-enterprises providing services for the production, transmission, and distribution of thermal energy	177.63	199.37	
	III-budget organizations, legal entities, and other consumers	245.74	255.77	
Almaty Almaty Su	I- population	48	25.87	01.02.2020 (for five years)
	II-enterprises providing services for the production, transmission, and distribution of thermal energy; organizations providing regulated services in the field of water supply and (or) sanitation	59.38	35.26	
	III-budget organizations, legal entities, and other consumers	161.31	70.65	
Aktau Kaspiy Shylu Su Arnasy	All consumers	89.35	60.92	01.07.2022-31.12.2022
Atyrau Atyrau Su Arnasy	Population	72.27	30.61	1.05.2022-30.09.2023
	Other consumers	239.37	154.41	
Karaganda Karagandy Su	Population	108.33	98.03	1.07.2022-31.12.2022
	Technical water (dachas)	32.07	-	
	Budget organizations	828,58	424,31	
	LLP “Teplotransit Karaganda”	147.41	397.12	
	LLP “Karaganda Energocenter”	120.5		
	LLP “Okzhetpes-T”	93.91		
	Legal entities with annual water consumption of fewer than 5000 m^3	365.31		
	Legal entities with annual water consumption of more than 5000 m^3	807.45		
Kostanay Kostanay Su	Population	72.05	56.08	From 1.08.2022
	Enterprises providing services to produce thermal energy	88.04	-	

	Budget organizations	2 609.11	1 639.94	
	Other consumers	274.42	162.85	
Ust-Kamenogorsk **Oskemen Vodokanal**	Population	49.66	60.92	01.07.2022-30.06.2023
	Budget organizations	206.1	211.7	
	Other consumers	1 058.7	206.66	
Shymkent **Vodnye Resursy Marketing**	I- population	96.73	38.79	01.07.2022-30.06.2023
	II-enterprises providing services for the production, transmission, and distribution of thermal energy	609.58	318.28	
	III-budget organizations, legal entities, and other consumers	456.88	234.34	
	LLP "Sairam Tazalyk"	22.364		
	Department of water supply and sewerage	22.364		
	Fee for consumers without metering devices for water supply services through distribution networks and wastewater disposal per 1 person per month (4.867 m^3)	470.77	188.75	
	Fee for consumers without hot water meters for wastewater disposal per person per month (3.194 m^3)		123.88	

Source: water tariffs are extracted from the websites of water utility companies (in the hyperlink)

Analysis of private capital participation in the water sector financing

The Law on Public Private Partnership (2015) defines the legal conditions of public-private partnership (hereafter PPP) and its implementation methods. It regulates social relations in preparing and implementing PPP projects and enforcing and terminating PPP agreements. According to Article 3 of the Law on PPP (2015), the main objectives of PPP are:

1) creating conditions for effective interaction between the public partner and the private partner to ensure sustainable socio-economic development of the Republic of Kazakhstan;

2) attracting investments to the state economy by pooling the resources of the public partner and the private partner to develop the population's infrastructure and life support systems;

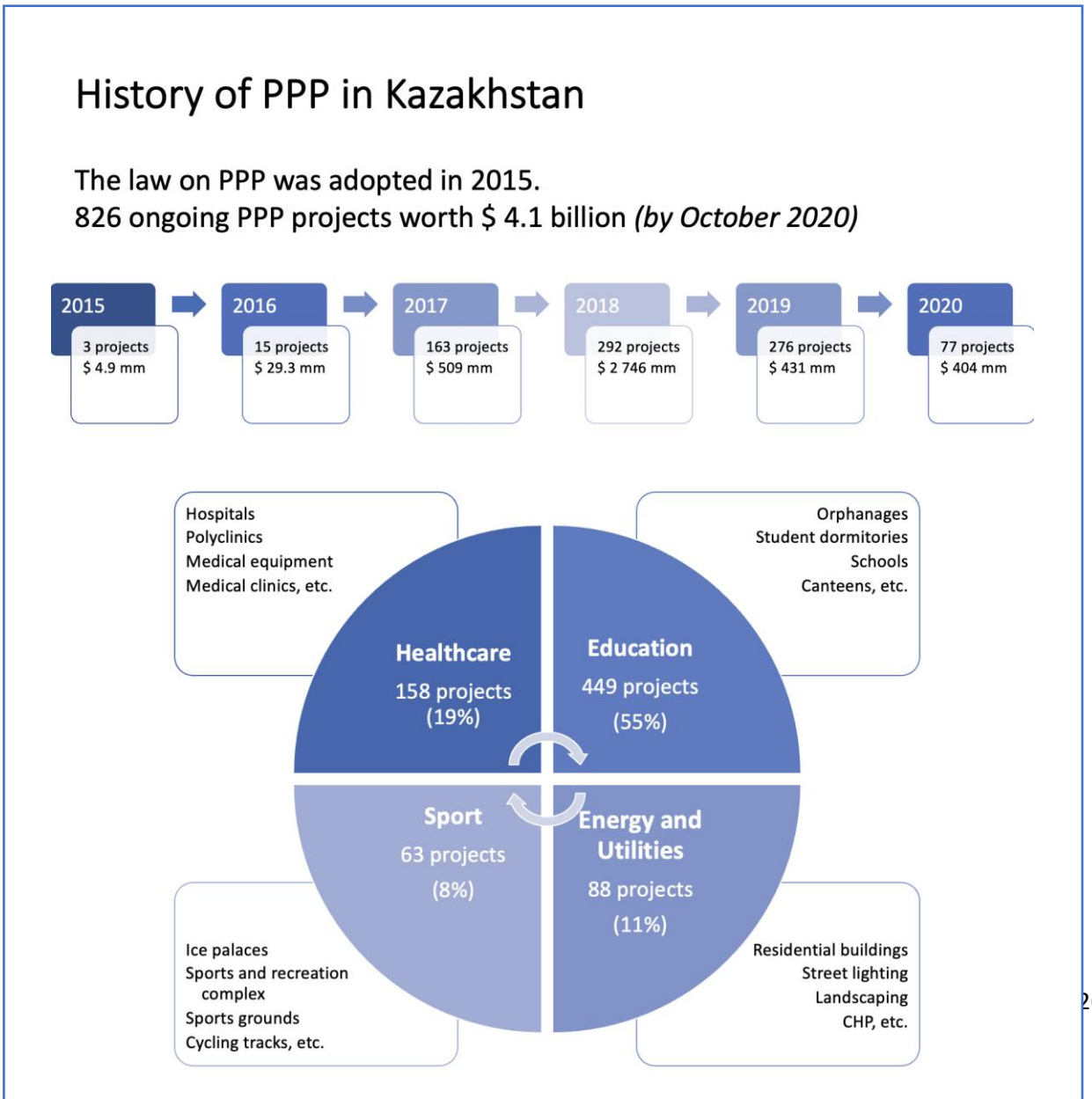
3) increasing the availability and quality of goods, works, and services, considering the interests and needs of the population, as well as other interested parties;

4) increasing the overall innovation activity in the Republic of Kazakhstan, including the promotion of the development of high-tech and knowledge-intensive industries.

The duration of PPP projects can be medium- or long-term (from five to thirty years, depending on the characteristics of the PPP project). According to Article 6, PPP can be carried out in all sectors of the economy. At the same time, the objects, the list determined by the Government of the Republic of Kazakhstan, cannot be transferred to implement PPP. Article 7 defines two types of PPP: institutional and contractual (concessions, service contracts, leasing, contracts concluded for developing technology, prototyping, pilot testing, small-scale production, and others). Meanwhile, Article 8 states that PPP projects are classified into the republican level (the beneficiaries are subjects of two or more oblasts, cities) and local level (the beneficiaries are subjects of one oblast, the city).

Box 2 presents the development of PPP projects in Kazakhstan. About 826 PPP projects have been implemented since 2015 for $4.1 billion (by October 2020). PPP projects in education account for more than half (55%) of the total number of PPP contracts. In second and third place are the healthcare, housing, and communal services sectors, respectively. At the same time, the most extensive projects were implemented in the field of transport and infrastructure. Most PPP projects are implemented at the local level.

Box 2 PPP development in Kazakhstan



Sources: translated from the presentation of E.Shynassyl (October 2020), https://forum.kzppp.kz

Kazakhstan Public-Private Partnership Center of the Ministry of National Economy was established in 2008 to provide research, training, expertise, and evaluation of the implementation of investment projects. This Center has a database of PPP projects on its website (https://kzppp.kz/projects). Statistics as of 06/01/2022 follow the total number of projects – 1354, at the stage of the competition- 74, at the stage of implementation- 825, and terminated contracts- 72. The total amount of attracted and planned investments is 1 356.3 billion tenge. Across 14 regions, Turkestan oblast has the highest number of PPP projects (184) with an amount of 87.4 billion tenge, followed by Almaty oblast with 81 PPP projects for 45.2 billion tenge, and East Kazakhstan oblast with 64 PPP projects for 17.4 billion tenge. Even though Atyrau oblast has implemented 29 PPP projects, the budget of these projects is 52.1 billion tenge.

Table 8 lists PPP projects in the water sector. In total, six projects were found in the database of the PPP Center: 3 in Almaty oblast, 2 in Akmola oblast, and 1 in Shymkent city. All six projects were implemented locally, mainly in the energy and utility sectors (water supply system, sewage treatment plant) and agricultural sectors (dam, agriculture). Project duration varies from 4 to 29 years, and investment attraction varies from 100 million tenge for dam operation in the Akmola region to 11 billion tenge for the sewage treatment plant in Kokshetau. Government partners are mainly departments al local execute bodies (akimats). However, this list might be incomplete and only mentions projects identified in the database.

The Ministry of Ecology, Geology, and Natural Resources also has budget program 105 “Development or adjustment, as well as conducting feasibility studies of budget investment projects, and tender documentation for public-private partnership projects, concession projects, advisory support for public-private partnership projects, and concession projects” from the category distributed budget programs, mainly from the Ministry of National Economy. Table 2 shows that the budget of this program increased from 3.5 million tenge in 2019 to 40.8 million tenge in 2021. Indicatively, in 2019 the budget was spent on the development of feasibility studies for three projects on the construction of a reservoir and counter-regulator in the Akmola region and the construction of a reservoir in the West Kazakhstan region; in 2020, eight feasibility studies were conducted on construction of five reservoirs in East Kazakhstan region and three reservoirs in Zhambyl region; and in 2021 four feasibility studies were financed on the construction of one reservoir in West Kazakhstan region, and three reservoirs in Karaganda region.

Table 8 PPP projects in the water sector

Region	Project level	Title of PPP project	Type of the object	Economic sphere (industry)	Project period	Investment attraction (thousand tenge)	Government partner
Almaty oblast	local	Reconstruction, construction, and operation of the water supply system in the village of Kainar, Karasai district	Water supply system	Energy and utilities	2020-2049	249 642	Department of Energy and Housing and Public Utilities
Almaty oblast	local	Reconstruction, construction, and operation of the water supply system of the station Kopa, Zhambyl district	Water supply system	Energy and utilities	2019-2048	122 983	Department of Energy and Housing and Public Utilities
Almaty oblast	local	Reconstruction, construction, and operation of the water supply system in the village of Zhaisan, Zhambyl district	Water supply system	Energy and utilities	2019-2048	294 367	Department of Energy and Housing and Public Utilities
Akmola oblast	local	Design, construction, and operation of sewage treatment facilities in Kokshetau	Sewerage treatment plant	Energy and utilities	n/a	11 538 425	Department of energy and housing and communal services of Akmola region
Akmola oblast	local	Overhaul, transfer to trust management, and operation of the dam in the village of Sepe, Atbasar district of Akmola region	Dam	Agriculture, forestry, and fisheries	2019-2034	100 916	Department of natural resources and regulation of environmental management of

							the Akmola region
Shymkent city	local	Service for mechanized cleaning of riverbeds and canals in the city of Shymkent	Agriculture	Agriculture, forestry, and fisheries	2020-2024	n/a	Department for the Development of a Comfortable Urban Environment in Shymkent

Source: extracted from the website of Kazakhstan Public-Private Partnership Center (https://kzppp.kz/projects), latest access on 13 July 2022. Note: n/a- not available

Another source of private participation in infrastructure projects is a database developed by the World Bank's Public Private Partnership Group aimed to collect and disseminate information on private participation in infrastructure projects in low- and middle-income countries by indicating the contractual arrangements, the sources, and destination of investment flows, and information on the leading investors[17]. According to the World Bank's dataset on Private Participation in Infrastructure[18], Kazakhstan has 50 projects that reached financial closure with a total investment of $5 809 billion from 1990 to 2021. Almost half of the total investments are PPP projects. Figure 3 shows that electricity has the most prominent investment share and the most significant number of projects among infrastructure projects, followed by ICT and natural gas projects. Only one project is registered in the water and sewage sector: the Shymkent Vodokanal project. EBRD has provided long-term loans to private water operator in Shymkent. The loan aimed to fund the construction of a new water intake facility and water and wastewater network rehabilitation[19]. The

Box 3 PPP example in water sector: case of Vodnye Resoursy Marketing in Shymkent

Vodnye Resoursy Marketing is a private operator providing municipal drinking water and wastewater services in Shymkent, with a population of around one million. The operator successfully operated for 24 years within the framework of a public-private partnership with the participation of the Akimat of the city of Shymkent with a share of 22.08% in the authorized capital.

EBRD and Vodnye Resoursy Marketing have had a long-term relationship since 2009 with the amount total loan of about €50 million with an interest rate of 5.5% per annum for upgrading and rehabilitation of the water and wastewater system, construction of a biogas plant, installment of an automated monitoring system for water supply in Shymkent. The government of Kazakhstan also co-financed by providing a capital grant; for example, in 2015, about €15 million, and the company further contributed the equivalent of 0.5 million from internal cash flow. In 2012-2020, the operator returned 8.8 billion tenge of the total loan amount. The company is operating profitably.

"As a result of the investments, an uninterrupted supply of water to the residents of the metropolis has been achieved. Regulatory and technical losses were reduced from 38.1% to 16%; the specific rate of electricity consumption was reduced from 0.87 to 0.07 kW/h/m3; reduced wear and tear of water and sewer networks; the accident rate on highways was reduced from 0.66 cases per 1 km to 0.31 cases/km; the number of blockages in sewer networks was reduced from 6 cases/km to 2.75 cases/km. As a result of the rational use of water, the daily consumption has been reduced from 456 liters per day to 120 liters" (https://www.wrm.kz/rus/innovation.html).

EBRD's provision of long-term financing to a private operator demonstrated the sustainability of the services provided by a private operator in Kazakhstan. The company has introduced the principles of corporate governance and international accounting standards. In 2018, the operator received certificates of compliance with international standards ISO 9001:2015 "Quality Management System" and ISO 14001:2015 "Environmental Management System."

Source: Report of Vodnye Resoursy Marketing in 2018, https://www.wrm.kz/docs/report/2017/2-rus-2018.pdf

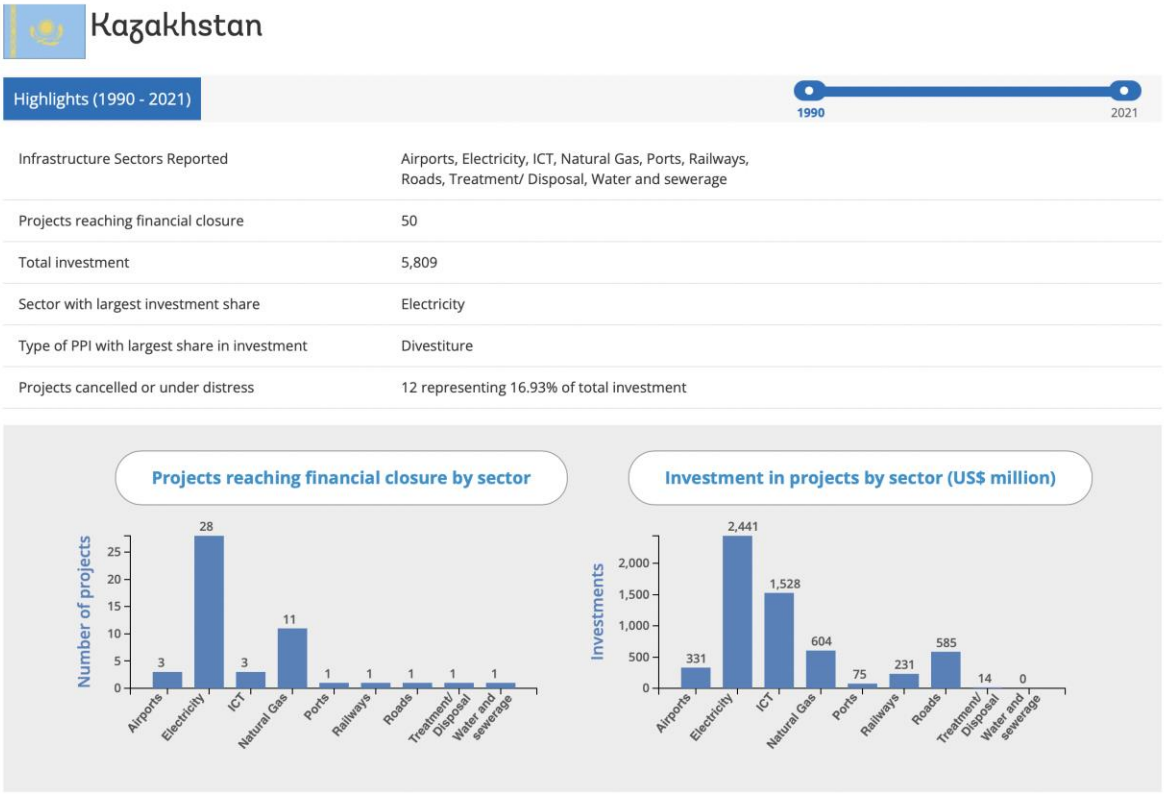
[17] Private Infrastructure Projects Database, https://ppi.worldbank.org/en/visualization

[18] The database records contractual arrangements for public infrastructure projects in low- and middle-income countries (as classified by the World Bank) that have reached financial closure, in which private parties assume operating risks. https://ppi.worldbank.org/en/methodology/ppi-methodology

[19] EBDR, Shymkent Water Project, https://www.ebrd.com/work-with-us/projects/psd/49938.html

box below describes the PPP example in the water sector: the case of Vodnye Resoursy Marketing in Shymkent.

Figure 3 Private Participation in Infrastructure, 1991-2021, Kazakhstan



Source: World Bank, Private Participation in Infrastructure, https://ppi.worldbank.org/en/snapshots/country/kazakhstan

The World Bank's dataset on Private Participation in Infrastructure is compiled from publicly available information and omitted national and local projects because of limited information. In comparison, the database of PPP projects of the Kazakhstan Public-Private Partnership Center represents PPP projects at the republication and local levels. Yet, data on private-sector investments (including large private operators, households, or others) remains challenging to collect, even though private investments represent an important source of funding for the sector. Hence, data on private sector participation remains fragmented.

Analysis of water sector financing gaps

The water sector is mainly funded from the public budget because of its specificities, such as equity, affordability, and safety issues. Water is considered a public good that is a free or low-cost good causing extensive consumption and exploitation of resources (Tecco, 2008). Infrastructure investment in water, sanitation, and wastewater treatment is capital-intensive and requires high upfront costs and long payback periods. Traditionally, the water sector relies on public financing, including government transfers, subsidies, grants, tariffs, fees, and low-interest loans; hence managed by public authorities. However, public water service providers usually have low private

finance mobilization capacity and poor creditworthiness to borrow long-term loans from commercial lenders (OECD, 2011; Hahm, 2019; Akhmouch & Kauffmann, 2013).

PPP has been widely promoted as an approach to help governments meet the growing demand for infrastructure-related services and improve water services. Still, private sector involvement in the water sector is limited. Private funding plays a crucial role in the water sector by improving water services and providing additional funding for water infrastructure development. Although private sector participation is mainly considered to reduce public authorities' financial burden, the private sector can also help with technology, knowledge, experience, business, and risk management skills (JICA, 2017). However, there are benefits and risks associated with private sector participation in the water sector, considering the vital objective of the private sector – generating earnings. Practice shows the following advantages of private sector participation in the water sector: improvement of water supply services, improvement of management efficiency of water supply services, partial replacement of public investment in infrastructure, operation, maintenance of water services, and improvement of financial sustainability and creditworthiness of water operators (OECD, 2011; Akhmouch & Kauffmann, 2013). For example, the performance analysis of 65 large PPP water projects in emerging and developing countries revealed the critical contribution of private participation in the urban water sector in reducing water losses and better water bill collections (Marin, 2009).

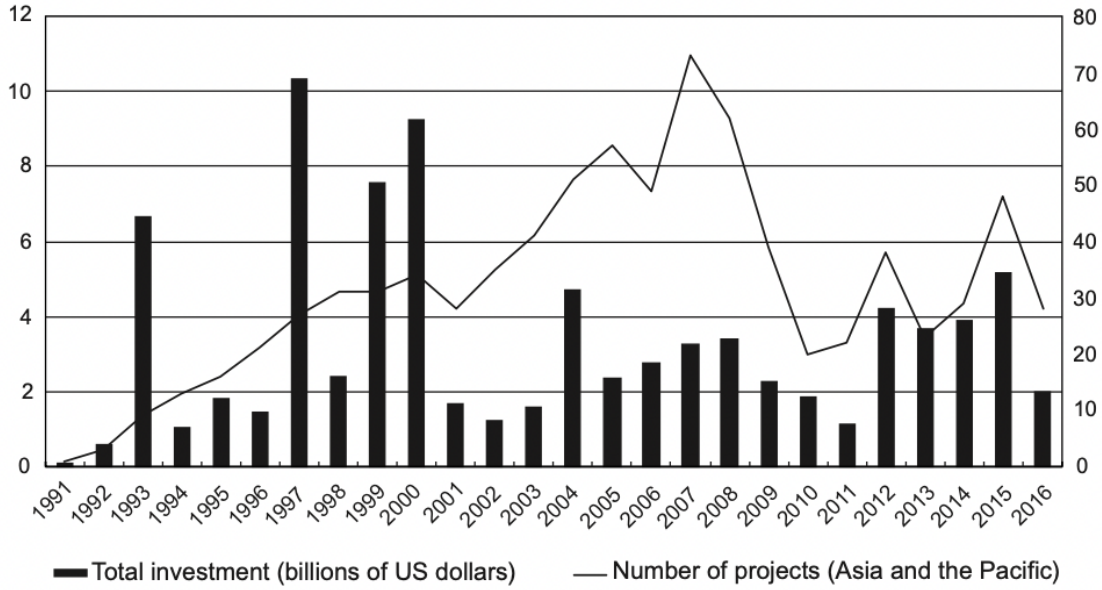
At the same time, there are certain risks of private sector participation in the water sector, including risks of cost minimization that can affect water quality, risks of high-water tariffs because of increasing costs, and risks of water services delay due to unpaid tariffs. In this regard, JICA (2017) suggests clarifying objectives of introducing private sector participation, policy measures in monitoring and enforcement systems, terms of the contract, competitive and transparent tendering procedures, rights, risks, and responsibilities of public authorities and private companies. For example, the analysis of PPP in China's urban water sector revealed that it is premature to conclude whether the different forms of private sector involvement will successfully overcome the significant problems of the water sector, such as capital shortage, inefficient operation, and service quality in China (Zhong et al. 2008).

The private sector should not be considered a key source of finance in the waters sector or even a substitute for public funding (Tecco, 2008). Government funding to improve water services will continue to play a significant role for the foreseeable future because of social and political constraints regarding the affordability and accessibility of water to the population, especially for vulnerable groups (OECD, 2011; Akhmouch & Kauffmann, 2013). Therefore, public water sector funding should be appropriately, effectively, and efficiently used, and water subsidies should be strategic, targeted, and transparent.

Box 4 Trends in water sector financing

Figure 4 presents private participation in water and sanitation infrastructure from 1991 to 2016, where private investments peaked in 1997 and since then have dropped with some fluctuations. In the 1990s, governments attracted private sector involvement in infrastructure projects to improve poor performance of public sector monopolies and reduce financing gaps. Even though the investment of international private investment in water and sanitation infrastructure increased in that period, these projects represented only 5.4 % of all private commitments to infrastructure, including financing for energy, transport, and telecommunications.

Figure 4 Private Participation in Water and Sanitation Infrastructure



Source: Private Participation in Infrastructure database of the World Bank, https://ppi.worldbank.org/en/ppi

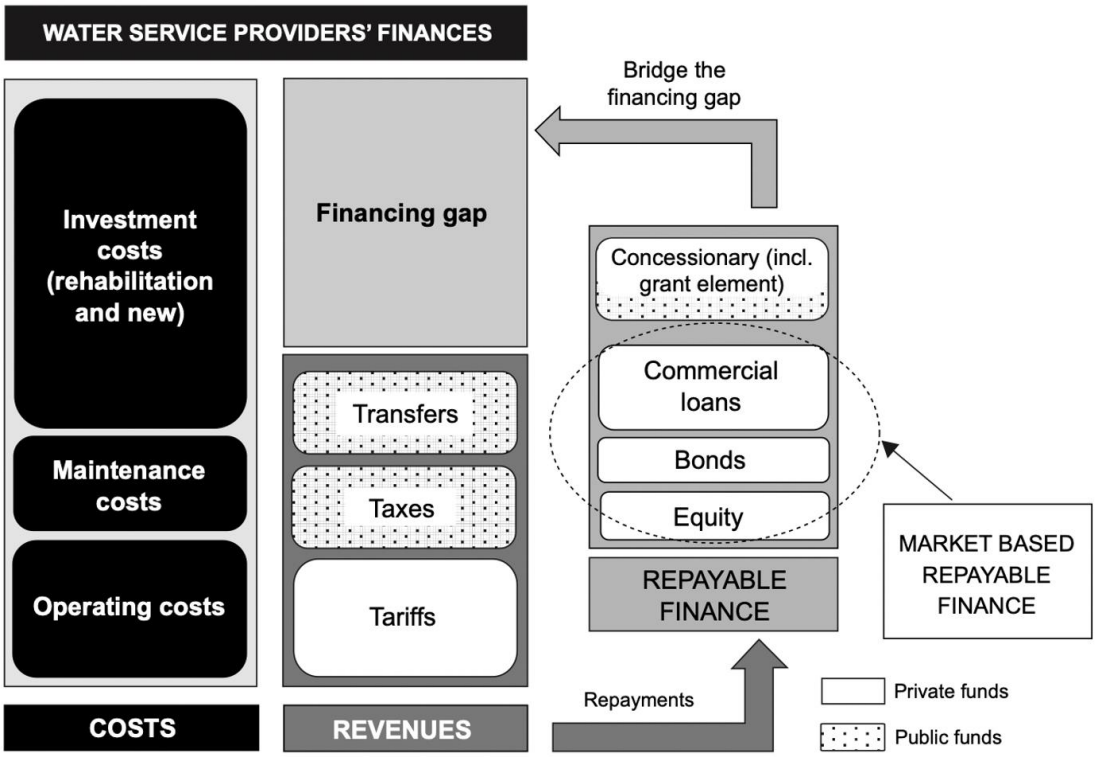
The decline in private investments in water and sanitation projects can be noticed globally, especially from global water multilateral corporations. Five international water operators (Suez, Veolia, Thames, Agbar and Saur) accounted for 53 % of all water and sanitation projects in 1990-1997, but this share reduced to 23% in 2003-2005. However, this trend varies from region to region.

The regression analysis of the impact of GDP, population size and diaspora on private investments in water and sanitation in Asia and the Pacific between 1993 and 2017 revealed that GDP and population size positively affected investment in water and sanitation in country, while diaspora had a negative effect. This finding is supported by the trend of high private investments in upper-middle-income countries with high GDP per capita and good financial and judicial institutions. At the same time, this finding is critical for low-income countries, which highly depends on international private investments. Yet this model consisted of three independent variables; while many factors affect private sector involvement in water sectors such as tariffs, governance, infrastructure conditions, capacity of central and local governments.

Source: Hahm (2019)

OECD (2010) presented a financing framework for water and sanitation investments. Figure 5 shows that water service providers face operating, maintenance, and investment costs partially covered by tariffs and public funds (transfers, taxes), but a considerable financing gap remains. Bridging the financing gap would require various repayable finance mechanisms such as private funds (equity finance, debt finance, commercial loans), concessionary loans from development finance institutions, and at the same time, reducing costs and increasing public funding (including transfers).

Figure 5 Financing framework for water sector investments



Source: OECD (2010)

OECD (2011) discussed reducing costs by improving the efficiency of operations because operational inefficiencies in the form of poor revenue collection, distribution losses, labor inefficiencies, and petty corruption are common problems in the water sector worldwide. Simultaneously, water operators can increase revenues by raising transfers from the state budget and increasing water services tariffs. Many emerging and developing countries also rely on international aid resources and assistance transfers, which remain insufficient in the future (OECD, 2011). Since water is an essential public good, water tariffs are politically and socially sensitive. Hence, the "willingness to charge" in most countries is lower than the willingness to pay because of social concerns in terms of affordability of water services by population (OECD, 2011).

Market-based repayable finance should be considered a source to bridge the financing gap but not close the gap because of high-interest rates. Figure 5 presents several repayable finance mechanisms. For example, equity and bond finance can be considered only in developed countries

because of the efficiency and low risk of the water sector. Meanwhile, many advanced and developing countries have short, medium, and long-term commercial loans for infrastructure projects. OECD (2010) discussed that private participation in the water sector could be the form of private financial institutions that provide commercial bank loans, but also private sector can be mobilized in the water sector in the form of formal private water and sanitation service operators based on a contract or license with the public authorities responsible for delivering services in region or country. OECD (2010) suggested some examples of innovative financial mechanisms under various challenges presented in Table 9.

Table 9 Examples of innovative financial mechanisms in the water sector

Critical mismatch	Examples of innovative financial mechanisms
Affordability constraints at household level	• Blending grants and repayable financing • Micro-finance • Output-based aid
Limited availability of funds for domestic operators and SSWSPs	• Micro-finance • Output-based aid and innovative contract
Risk profile and difficulties in managing certain risks (*e.g.* political risk, foreign exchange risk)	• Blending grants and repayable financing • Guarantees and risk insurance • Devaluation backstopping facility • Local-currency financing • Revenue agreements in lieu of guarantees
Lack of funds at decentralised level	• Municipal bonds • Pooled funds, revolving funds and bond banks • Instruments to increase sub-sovereign lending
Short tenor of available financing	• Guarantees • Equity contributions
Under-capitalised balance sheets	• Raising equity to strengthen the balance sheet, convertible loans, debt-equity swaps, "asset-light" expansion models
Lack of understanding by external lenders and investors	• Blending grants and repayable financing • Credit ratings • Project preparation facilities
Lack of "bankable" projects	• Project preparation facilities

Source: OECD (2010)

The analysis of water sector financing in Kazakhstan revealed that different budget programs support the water sector, mainly in the rehabilitation and construction of water infrastructure. Even though water tariffs (irrigation, drinking water, wastewater services) have increased last few years, it is still limited to covering water utility operators' operation and maintenance costs. The public budget for water infrastructure is not sufficient; therefore, long-term loans were borrowed from international finance institutions. According to the Committee of Water Resources estimates, about 925 billion tenge is needed for the rehabilitation and reconstruction of water infrastructure in Kazakhstan[20]. The analysis of PPP projects in Kazakhstan revealed limited PPP projects in the water sector.

[20] Regulatory policy advisory document "Water Code of the Republic of Kazakhstan (new edition)", dated 23/02/2022, https://legalacts.egov.kz/npa/view?id=14011779

Specificities of the water sector mentioned earlier are also present in the context of Kazakhstan: the low "willingness to charge" because of political and social concerns, low tariffs and high regulations from the national monopoly agency, insufficient revenue from tariffs to cover maintenance, operation, and rehabilitation costs, aging water infrastructure and additionally high-water losses. There are many inefficiencies in the water sector: limited coordination among sectors, lack of long-term strategic planning and policy, high regulations from natural monopoly agencies, and others that constrain private sector participation.

Developing PPP in the water sector requires improvement, which should be attractive for private investments. Private sector participation in the water sector highly depends on water tariffs. On the one hand, water tariffs should cover operation and maintenance costs and even generate revenue. On the other hand, water tariffs should be affordable, and revisions of water tariffs should be regulated. For example, in 24 European countries, 95% of the population can pay water bills without facing affordability constraints (OECD, 2022). While in Kazakhstan, there is a lack of data and analysis about the affordability of water tariffs (including drinking water, wastewater, and irrigation) among the population. Water tariffs should be revised toward valuing water economically and equitably. Especially, unified water tariffs for irrigated agriculture should be reconsidered because of climate and hydrological and socioeconomic differences among regions. Despite the increased public funding for water infrastructure, this funding remains insufficient. Hence, water asset assessment and capital expenditure planning should be conducted in addition to strategically targeted allocation for public subsidies for water infrastructure construction and rehabilitation.

SECTION 2 REVIEW OF LEGAL, ORGANIZATIONAL AND GOVERNANCE PROVISIONS OF WATER SECTOR FINANCING

Review of water policies, legal instruments

The national water legislation is complex and based on the Constitution of the Republic of Kazakhstan, the Water Code, and other normative acts, including 28 international treaties, 11 Codes, 37 Laws, 21 Decrees of the President of the Republic of Kazakhstan, and 115 Government Decrees related with water management aspects[21]. This is also reflected in the weak enabling environment (including policies, legislations, and regulations) in assessing IWRM implementation in Kazakhstan in 2020. In addition to the Ministry of Ecology, Geology, and Natural Resources, state regulation of the water fund is carried out by nine other agencies with unclear and overlapping responsibilities and limited coordination among organizations on water policy.

According to Article 6 of the Constitution of the Republic of Kazakhstan[22], the land and its subsoil, *water*, flora and fauna, and other natural resources belong to the people. The state exercises the property right on behalf of the people. Article 8 of the Water Code (2003) states that the water fund is exclusive state property. The water fund's right of ownership, use, and management belongs

[21] IWRM Country Report, 2020, http://iwrmdataportal.unepdhi.org/country/Kazakhstan

[22] Constitution of the Republic of Kazakhstan adopted on 30 August 1995 at the republican referendum and changes adopted on 5 June 2022 at the republican referendum

to the Government of the Republic of Kazakhstan. Meanwhile, land plots of the water fund, occupied by water management facilities (irrigation and drainage systems) of inter-district (regional) and inter-farm (district) levels, as well as irrigation facilities serving the land plot of one economic entity, may be privately owned by citizens and non-state legal entities of the Republic of Kazakhstan in case of privatization of these facilities (Article 7). However, the legal regime of the land of the water fund and the legal regime of the water management facility may not always coincide.

Ownership over water facilities can be divided into public and private ownership (Water Code, 2003, Chapter 4, Article 24). Furthermore, public ownership over water facilities is classified into republican and communal ownership. Water facilities under republican ownership can be leased, trust management, and privatized by the legislation of the Republic of Kazakhstan (Water Code, 2003, Chapter 4, Article 26). However, water facilities of exceptional strategic importance (including water intake systems, pumping stations, and water treatment facilities) are state-owned, cannot be leased, and are not subject to alienation (in detail will be discussed in Section Review of Current Water Infrastructure). Water management facilities under communal ownership are assigned to state utility companies and, by the legislation of the Republic of Kazakhstan, can be leased, trusted, and gratuitously used, except for water management facilities of exceptional strategic importance (Water Code, 2003, Chapter 4, Article 27).

Table 10 summarizes the ownership and funding of water facilities. Transboundary and interregional water facilities, as well as water facilities of strategic importance, belong to republican ownership and are financed from the republican budget. Inter-district, inter-farm water facilities, and water supply networks are assigned to communal ownership and funded from local budgets and revenue from water services tariffs. There are also on-farm channels and facilities under private ownership and private funding. Farmers invest in irrigation ditches because it directly impacts their harvest. However, farmers are not interested in investing water saving technologies because of low water tariffs and high costs of these technologies not only in purchasing but also in high maintenance and operation costs.

Table 10 Funding and ownership of water facilities

Ownership	**Water facilities**	**Funding**	**Management**
Republican	Transboundary and interregional water facilities, as well as water facilities of strategic importance	Republican budget	State organizations (Kazvodkhoz and others)
Communal	Inter-district, inter-farm water facilities, water supply networks, and other water facilities	Local budget and water tariffs	Akimats (local executive bodies)
Private	On-farm channels and facilities	Private funding	Private

Source: author's excerpts from the Water Code (2003)

According to Chapter 28, Article 135 of the Water Code (2003), public policy for funding water management facilities, water supply, and wastewater services consists of the following measures:

1) maintenance of state institutions of the water management system;

2) financing operating costs of transboundary water facilities and water facilities of republican significance that are not related to water supply;
3) financing restoration measures of emergency water facilities and irrigation and drainage systems;
4) fundraising, including borrowed funds, for the construction of new and reconstruction of existing water management facilities and irrigation and drainage systems;
5) subsidizing the cost of services for the supply of drinking water from critical groups and local water supply systems, according to the lists approved by local executive bodies;
6) subsidizing the construction, reconstruction, and modernization of water supply and sanitation systems, including technical support of projects (development of a technical justification, design estimates, the implementation of technical and architectural supervision) and capital-intensive expenses (expenses for construction and installation works, purchase of equipment, materials);
7) provision of concessional and long-term loans and other preferences to water management entities and water utility organizations;
8) financing safety measures of state-owned water management systems and facilities.

Analysis of legal gaps in water sector financing

The key legal document on water resources, the Water Code, was adopted in 2003; since then, more than 70 changes have been made[23]. As a result, the Water Code represents inconsistent norms, duplication of norms, and legal gaps. According to the Decree of the President of the Republic of Kazakhstan No. 582 dated 24 May 2021, water legislation shall be improved and adopted in the first half of 2023. The new Water Code will revise approaches to water resources management, protection and use of water resources, water conservation, and requirements for developing schemes for the integrated use and protection of water resources. The Committee of Water Resources also proposed to exclude from the scope of the Water Code issues related to ensuring the safety of hydraulic structures; water supply and sanitation in housing and communal services; hydro melioration of lands; prevention and elimination of the harmful effects of water; creation and operation of agricultural cooperatives of water users. As a result, the Committee of Water Resources lobbies for including and managing only surface water resources and excluding other sectors from the Water Code. At the same time, the Committee of Water Resources always complain about the low status of other national institution responsible for water resource management but is not interested in taking responsibility for holistic and integrated water resource management where water infrastructure is interconnected, water demand is growing, and water sources (surface and groundwater) are interlinked. Exclusion of aspects about the safety of hydraulic structures, water supply and sanitation, hydro melioration of lands, and others would require simultaneous (subsequent) changes in other legal acts, including six codes and about 18 laws and development legislative acts in the field of safety of hydraulic structures and water supply and sanitation. The draft of the new water Code is still under public discussion. A subsequent public meeting to analyze the regulatory impact of introducing the new Water Code took place on 31 August 2022.

[23] Regulatory policy advisory document "Water Code of the Republic of Kazakhstan (new edition)", dated 23/02/2022, https://legalacts.egov.kz/npa/view?id=14011779

Analysis of water sector and sub sectoral legal instruments for investments

As was mentioned earlier, the Law of PPP (2015) regulates the legal conditions of PPP projects' implementation, enforcement, and termination of PPP agreements. According to the Law on PPP, objects of PPP projects include property, property complexes, design, construction, creation, reconstruction, modernization, and operation, including works (services) and innovations to be introduced during the implementation of PPP projects. According to Article 6, PPP projects can be carried out in all sectors of the economy. Kazakhstan Public-Private Partnership Center of the Ministry of National Economy is a legal entity established by the decision of the Government of the Republic of Kazakhstan to carry out activities of PPP projects. Article 7 states two types of PPP projects: institutional and contract.

Furthermore, contractual PPP projects can be concessions, trust management of state property, leasing, service contract, and other agreements corresponding to the PPP projects. Article 9 lists the sources of financing PPP projects: private funding, borrowed funds, state budget funding, funds of subjects of the quasi-public sector, and other sources not prohibited by the legislation of the Republic of Kazakhstan. The central authorized body determines the potential risks of PPP projects for state planning, and the distribution of risks between the public partner and the private partner should be clearly defined PPP agreement (Article 14).

The rights and obligations of the private and public sectors are defined in Chapter 2. For example, a private partner has the right to make proposals to change the terms of the PPP agreement; upon early termination of the PPP agreement, demand payments and compensation in the cases and the manner established by the PPP agreement; at its discretion, use the net income received from its activities in PPP project, after paying taxes and other obligatory payments to the budget by the legislation of the Republic of Kazakhstan (Article 16). Chapter 3 of the Law on PPP describes state regulation of PPP and the competencies of different levels of government (central, regional, and local governments).

According to Article 31, a private partner can be defined via tender (open and closed tenders), direct negotiations, and auction. A simplified procedure of private partner selection is carried out exclusively for local PPP projects following the provisions of the Law. Article 32 lists the qualification requirement for the potential private partner. Articles 45, 46, and 48 describe the terms, content, and duration of the PPP agreement. Finally, the last chapter, Article 57, states dispute resolution issues. In addition to the Law on PPP, the Law on Concessions[24] regulates PPP projects with a focus on objects of tourist activity, social and public infrastructure, and life support in all sectors (spheres) of the economy.

Assessment of private capital participation in water sector financing from a legal perspective

Mengistu (2013) conducted a comprehensive analysis of infrastructure financing mechanisms and identified factors potentially affecting private investments. Table 11 presents three categories:

[24] Law of the Republic of Kazakhstan dated July 7, 2006 No. 167 On concessions, https://adilet.zan.kz/rus/docs/Z060000167_#z18

government motivations, private firm motivations, and enabling environment. From the legal perspective, some elements of enabling environment and private sector motivations will be considered to assess private capital participation in water sector financing in Kazakhstan.

Table 11 Factors potentially affecting private investments

Category	Factors identified in the literature
Government motivations	• Ability of government to finance infrastructure • Improved efficiency and tariff discipline in infrastructure sectors
Private firm motivations	• Adequate regulatory framework and proper enforcement of laws • Independence of regulatory institutions and processes • Access to credit • Consumers' ability to pay for services • Government effectiveness and responsiveness • Political stability and public opinion on private provision of infrastructure services
Enabling environment	• Macroeconomic environment • Institutional capacity to regulate PPPs • Structural characteristics of country

Source: Mengistu (2013)

The analysis of PPP projects in Kazakhstan revealed that a regulatory framework in the form of the Law of PPP exists in Kazakhstan. There is also a national institution responsible for developing PPP projects in the country. Regulations in Kazakhstan allow private sector participation, but PPP projects in the water sector are underdeveloped. The private sector is not interested in the water sector because of its specificities mentioned in Section 1. According to EBRD (2018), PPP contacts in the water utility sector can be feasible only in the large and successfully developing cities of Kazakhstan, however under conditions "*if tariffs converge to commercially viable levels and are approved for a sufficiently long term to generate a cash flow that covers the utility firm's operating costs and achieves the expected rate of return*" (p.21). EBRD has a long-term investment relationship with the private water utility company in Shymkent and considers it a leading model for utility investment in Kazakhstan (see details in Box 3). To improve regulatory and institutional aspects in the water utility sector, EBRD (2018) suggested the development of long-term corporate strategy, improvement of the performance of state-owned water utility companies, improvement of tariff collection, review of tariff regulations, and improvement of stakeholder interaction.

The private sector pays great attention to the adequate regulatory framework and proper enforcement laws, including transparency of process: planning (setting investment priorities), financing (coordination among different sources of financing), procurement (clear rules and regulation in the tender process), contractual design (terms and regulations in the contract), and monitoring (transparent ex-post evaluation and post-procurement reporting) (Tecco, 2008; Mengistu, 2013). According to Corruption Perception Index[25] in 2021, Kazakhstan got 37 out of 100 scores and ranked 102 out of 180 countries, meaning that public sector corruption perception remains relatively high. In this regard, a strong legal system, transparent contractual procedures, and effective enforcement of water regulation and allocation mechanisms might strengthen

[25] Corruption Perception Index, 2021, Kazakhstan, https://www.transparency.org/en/countries/kazakhstan

enabling environment. Moreover, the water financing ecosystem might be improved by developing not only water-specific policies but also policies related to the financial sector and capital markets by addressing private investment uncertainties and risks (macroeconomic risks, commercial risks, and other investment risks).

Government effectiveness is another critical factor from an institutional and legal perspective influencing private investment in the water sector. Institutional fragmentation of the water sector in Kazakhstan, where nine state agencies are involved in the water sector, limited coordination among these organizations, poor policy objectives, and the Water Code with inconsistent norms and legal gaps. The Ministry of Ecology, Geology, and Natural Resources, with its Committee for Water Resources, is responsible for water policy formulation and implementation countrywide, including water usage, resource allocation, and water supply. National and international experts highlighted the limited capacity of a national institution in terms of water resources management and coordination of water issues, among other state agencies. The Water Code should be improved, but the Committee for Water Resources responsible for the development of a new Water Code plans to remove many water regulations (including water supply, wastewater treatment, and infrastructure safety), which will cause the development of additional rules, norms, and laws that might cause further chaos in water resources management and could also be considered as another obstacle of the attractiveness of water sector to private investments. Institutional fragmentation of the water sector can be improved by creating mechanisms to facilitate water policy coherence across sectors. In 2022, the Water Council was established under the Prime Minister's chairmanship to improve Kazakhstan's water resources management system. The Water Council aims to develop recommendations on national policy priorities in water resources management. Additionally, the Water Council might coordinate on water policy and improve water resources management to strengthen water security at the country level.

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ANNEX: NATIONAL REPORT—KYRGYZ REPUBLIC

Water Sector Financing in the Kyrgyz Republic
By Emil Iusupov

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List of abbreviations and acronyms

CURRENCY EQUIVALENTS

Currency Unit – Kyrgyz Som (KGS)

(10 July 2022)

KGS 1.00 = USD 0.012

USD 1.00 = KGS 82.4

List of abbreviations and acronyms

ADB	Asian Development Bank
BC	Basin Council
BWA	Basin Water Administration
CSU	Central WUA Support and Regulatory Unit
GAFSP	Global Agriculture and Food Security Program
Ha	Hectare
I&D	Irrigation and Drainage
ICWC	Intergovernmental Co-coordinating Water Commission
IDB	Islamic Development Bank
ISF	Irrigation service fee
KGS	Kyrgyz som
M&E	Monitoring and Evaluation
MoA	Ministry of Agriculture
MoES	Ministry of Emergency Situations
MoFA	Ministry of Foreign Affairs
MoH	Ministry of Health
MoJ	Ministry of Justice
MoNRETS	Ministry of Natural Resources, Ecology and Technical Supervision
MOM	Management, Operation and Maintenance
NUWUA	National Union of WUAs
OSU	Oblast WUA Support Unit
OVK	Provincial Irrigation Department (*Oblvodkhoz)*
RSU	Raion WUA Support Unit
RVK	District Irrigation Department (*Rayvodkhoz*)
SNC	Second National Communication
SWA	State Water Administration
USD	Unites States dollar (about KGS 82.4)
UWUA	Union of WUAs
WMC	Water Management Council
WRS	Water Resources Services
WUA	Water Users' Association
WRS	Water Resources Service
WUA(F)	Water User Association (Federation)

Executive summary

This report is part of a CAREC Institute's 'research package' the analysis of water infrastructure financing and potential for increased private sector's role under the CAREC umbrella on Water Pillar- investment support for water infrastructure, prepared by consultants' team under the TA-6694 with core and non-core activities.

Water is a cross-cutting issue which demands attention at all levels and across sectors. Water issues involve many stakeholders with conflicting and competing needs and cross multiple physical, political and jurisdictional boundaries (Rio+20). Cooperation is necessary to deal with issues such as water allocation decisions, upstream and downstream impacts of water pollution and water abstraction, construction of infrastructures, overexploitation, deciding on economic regulation, financing management of water resources and water services. [1]

The Kyrgyz Republic is an upstream country and water resources are completely formed on its territory. Water resources are represented by river runoff, groundwater and water accumulated in glaciers and lakes.

Despite the availability of water resources, a review of water sector indicators and research reports[2] show that the Kyrgyz Republic in the face of climate change and other factors faces several challenges which have not been adequately addressed by existing resources and institutions, existing economic instruments, or revenues(charges) available to the sector.

The key challenges can be grouped as follows:

- Insufficient water for some users, on the one hand, and inefficient use and/or under-utilization of water resources, on the other hand (e.g. under-utilization of water for hydropower generation and thermal water);
- Uncertainty about the availability of water resources in the future, associated with the impacts of climate change (glacial retreat, changes in precipitation and run-off patterns, etc.);
- Low quality water services provided by existing infrastructure including low coverage and/or inefficient operation of existing water systems;
- Lack of monitoring of water resources (lack of gauging stations "hydro-posts, especially automatic ones, as well as monitoring of groundwater levels and quality; lack of water quality analysis);
- High risks for population, property and water infrastructure (e.g. irrigation and drinking water mains) associated with water-related natural hazards (mudflows and land-slides, collapse of alpine lakes, groundwater flooding) and other natural phenomenon (extreme temperatures and earthquakes);
- Subjective factors: poor financial status of the water sector: e.g. due to the low tariff rates in the irrigation sector, up to 90% of the operating and maintenance costs have been subsidized from the national budget, lack of maintenance and repairs; many water utilities (vodokanals) are effectively bankrupt;
- Structural (water institutions) and contentual complexity in water management (long-going processes on the implementation/adoption of Water Code and lack of the National Water Strategy);
- Low salaries and lack of qualified staff in the water sector.

[1] UN Water Cooperation Brief (2013). Retrieved from here

[2] Improving the use of Economic instruments for water resource Management in Kyrgyzstan (2013). Retrieved from here

The report summarizes the results of the analysis of water sector financing and legislation of the Kyrgyz Republic to identify the existing barriers to sector financing, including:

a) Analysis of the legal and regulatory framework for financing of the water sector;

b) Analysis of the water sector financing;

c) Analysis of existing infrastructure management, collection and use of water tax or fees;

d) Review of investment and tariff policies of the water sector and models for private sector involvement;

e) Recommendations for further development of investment and tariff policies in the water sector;

f) Review of projections of necessary investments from different funding sources in the water sector of the Kyrgyz Republic. Review of current water infrastructure in the Kyrgyz Republic.

g) Needs assessment and an action plan.

1. Water sector overview

Agriculture is one of the Kyrgyz Republic's most important economic sectors, contributing to approximately 10-12% of the gross domestic product. Agriculture's production volume decreased by
-5% in 2021, which was caused mainly by difficult climatic conditions for agricultural production. Abnormally high summer temperatures in 2021 and lack of irrigation water during the growing season caused a decrease in grain crop yields[3]. The sector employs about 20% of total employment population in the country, although its relative contribution to employment in the country has declined significantly in recent years, the share of employment in the agricultural sector has decreased by 3.5 times since 2000. Most of the agricultural production is concentrated in small individual farms. Total irrigated area of the Kyrgyz Republic estimated about 1.02 million hectares and about 74% (756,754 ha) are under the management of Water User Associations (WUAs).

Water resources: in the aggregate of current estimates, the total amount of water resources of the Kyrgyz Republic is about 2,458 km³, including 650 km³ of water in glaciers, 1,745 km³ in the lakes, as well as 13 km³ of potential groundwater resources, and from 44.5 to 51.9 km³ of Annual River flow. The Kyrgyz Republic ranks the second place in Central Asia by the specific indicators of reserves of water resources per capita.

According to research studies Kyrgyzstan is one of the most vulnerable countries to climate change in Central Asia. Kyrgyzstan's Second National Communication (SNC) identified impacts on water resources as one of the most severe climate change risks facing the country. As noted in the SNC, vulnerability assessments have been conducted on glaciers and volume of surface water-flow in the Kyrgyzstan territory using models developed by the Institute of Water Problems and Hydropower Engineering of the Kyrgyz Republic National Academy of Sciences. And projections of climate change show that competition for water within each country and between countries will become even more acute in the future, as significant reductions in river and surface water runoff by the middle of the 21st century.

The structure of domestic water consumption in the Kyrgyz Republic remains sufficiently stable for many years and does not involve significant changes in the medium-term perspective. At the average, about 94% of the water volume is annually used for the needs of irrigated agriculture; about 2-6% for water supply to the population and industrial production demands. Forestry, fisheries, energy, and other water-using sectors of economy, together with service industries use about 1-2% of the total domestic water consumption (Table 1).

Table 1. Use of water resources in the Kyrgyz Republic (mln m3)

	2017	**2018**	**2019**	**2020**	**2021**	
Water abstraction from natural water sources	7 657.8	7 758.0	8 068.7	8 017.9	7 999.5	
From underground water	224.6	245.0	254.8	249.8	252.9	
Water consumption	5 072.3	5 088.7	5 211.1	5 237.5	5 310.0	
For production needs	69.1	82.5	84.3	82.5	80.2	*2%*
For irrigation and agricultural water supply	4 821.6	4 817.0	4 920.7	4 942.0	4 986.9	*94%*
Waste water	101.6	101.1	99.3	123.4	133.1	*3%*

[3] Ministry of Economy and Commerce of the Kyrgyz Republic. (2022, January 14): The country's economic growth is better than expected. Retrieved from here

Purified according to standards water	95.4	96.1	94.3	118.4	129.1	*2%*
Wastewater discharge (without treatment or not enough treated)	2.1	1.9	1.9	1.9	1.7	*0.03%*

Source: National Statistic Committee

Irrigation infrastructure. Since the collapse of the Soviet Union, water management institutions have weakened, and infrastructure maintenance has in many places come to a standstill. Recently, there have been substantial investments in the irrigation sector financed/committed by the development institutions (at least USD 259.3 million, see Annex 1) and the government (at least USD 101 million). However, despite these substantial efforts, it is estimated by the WRS that the existing off-farm and on-farm irrigation and drainage systems still need rehabilitation. Overall, the poor maintenance of irrigation infrastructure has led to environmental problems such as land salinization and waterlogging, which have a negative impact on agricultural productivity.

1.1. Review of Water Sector Financing in the Kyrgyz Republic

1.1.1. Analysis of the legal and regulatory framework for financing of the water sector

The legal, policy and planning framework for the water sector in the Kyrgyz Republic consists of a large number of laws, circulars, regulations, planning documents. The most important of these are the Water Law of 1994, the Water Users Law of 2002 and the Water Code of 2005.

The key water-related national legal acts of include the following:

- *water laws* – the Water Code (2005), the law "On Drinking Water" (1999) and law "On Water" (1994),
- water financing and economic regulation laws/Government Decrees – Budget Code, "Procedure for Determination and Collection of Charges for Use of Surface Water Resources in the Kyrgyz Republic",
- *environmental laws* – the law "On environment" (1999) and the law "General technical regulation on provision of environmental safety" (2009г.),
- *the laws regulating complex sanitary-epidemiologic requirements* - the law "On health protection of citizens of the Kyrgyz Republic" (2005), law "On public health" (2009), the law "On protection of consumers rights" (1997),
- *the laws regulating procedures related to quality of water resources as well as certification of entities performing this activity* – the law "On Ecological Expertise",
- *the laws regulating the quality of drinking water* – the law "Technical regulations "On safe drinking water" (2012),
- *The strategies and programs on the development of the water sector* - National Development Strategy of the Kyrgyz Republic for 2018-2040 (2018), "On State Irrigation Development Program of the Kyrgyz Republic for 2017-2026" (2017) and Decrees of President "On the National Development Program of the Kyrgyz Republic until 2026" and "On measures to develop the agro-industrial complex of the Kyrgyz Republic"; and Government Decree "Program of development of drinking water supply and sanitation systems in rural areas of the Kyrgyz Republic until 2026",
- the laws on structure of the Government of the Kyrgyz Republic, local administration and local self-governance, land, subsoil, energy, emergencies, public associations of water users as well as other laws related directly or indirectly to regulation of use and protection of water resources and public health.

The fundamentals of national water policy as a framework and economic instruments for water resource management are stated in the Water Code. This ideology complies with the key principles of Integrated Water Resources Management.

The two important institutions envisaged by the Water Code are: (i) the National Water Council (NWC), and (ii) the State Water Administration (SWA). The NWC, chaired by the Prime Minister, is responsible for water sector coordination, planning and legislation. The State Water Administration would assume responsibility for water resources management and the implementation of the Code, including the establishment of Basin Water Administration units and Basin Councils in each major river basin.
The Water Code contains a wide range of economic tools for water management:

- water supply contract payment - the fee charged by the water supplier to the contract holder in accordance with the annual water supply contract,
- payment for the use of water as a natural resource - a payment established by the legislation of the Kyrgyz Republic,
- payment for irrigation services (ISF) - payment rate for irrigation water delivery to a water user in the area of responsibility of a local government, water user association or other person, in case there is no water user association,
- discharge permit (payment) - a permit to discharge pollutants or wastes into water bodies, collector-drainage systems, irrigation, filtration and evaporation fields, terrain,
- water pollution charges,
- payment for water abstraction – covering costs of site survey and publication by SWA.

These instruments provide ample opportunities to improve water resource management without major legislative change. However, in their existing form or state of implementation, these existing economic instruments neither create the right incentives (for pollution prevention, for the efficient use of water resources and for efficient operation and maintenance of water systems); nor do they generate sufficient revenues for the financial viability of the water sector[4].

However, mechanisms of application of some economic instruments are not developed and adopted, which in practice remain unrealized. Although the application of these tools would reduce the burden on the state budget and thus increase the autonomy of the sector.

In general, further specification of water policy in the form of the National Water Strategy, as envisaged by the Code, has not been implemented so far either. In recent years, several versions of the Water Strategy concept and a roadmap for implementing the Water Code have been developed, but none of these versions has yet received official approval.

To date, the implementation of the Code and other supporting documents has been stalled principally by the reforming of Government structure and changes of functions between respective agencies. Moreover, after the last reform of the Government Structure the decision of the Government on NWC has been declared invalid (14.01.2022). The establishing of new NWC and SWA is still ongoing.

Delayed implementation of water management reforms, along with limited resources allocated to the sector and other challenges, also constrains improvement of water sector financing and implementation/adoption of economic instruments.

[4] *UNECE, OECD.* National Policy Dialogue on Integrated Water Resources Management (2013). Retrieved Aug 2022, from here

Analysis of the legislation (Water Code, Water users' law, Law on Tariffication of irrigation water supply services and Law on Public Private Partnership) in terms of financing and current mechanisms of cost recovery of the water sector has shown that there is a need to improve legislation in order to create economically sustainable in irrigation sector (mainly on on-farm level) and favorable conditions (implementation of an adequate tariff policy that allows to consider the interests of investors from the private sector) for attracting investments of the private sector to the water sector.

1.1.2. Analysis of the water sector financing by institutions

State budget of the Kyrgyz Republic and development institutions fund the costs of MOM on off-farm level, funding the costs of MOM at on-farm level is split between state budget and revenues collected from water users. Allocations from State budget are generally too low to ensure the physical sustainability of infrastructure and irrigation service fees collected from water-users are insufficient to cover the MOM costs at the on-farm level[5]. Expert estimated that payments (ISF) received from water users covered only about 6-8% of MOM costs of the State budget.

Government institutions

Water Resources Services under the MoA (WRS). WRS consists of a Central Office in Bishkek, 7 offices at Oblast level, 5 Basin Water Resource Management Administrations, 40 District Irrigation Departments (Raivodkhoz, RVKs) and 3 irrigation reservoirs. The total staff number of WRS as per 1 July 2022 is about 4850 people. WRS in mid-2022 had 4,848 employees.

The Central Office in Bishkek and WRS-branches in regions are funded by the State Budget. Additional funding is provided by the Special Fund of the WRS for the WRS-branches in regions. For 2018-2021 the funding of WRS from these two sources was as shown in the table below; in 2021 total WRS funding amounted to KGS 1.18 billion, with 91% coming from the State Budget and 9% from the Special Fund of the WRS. According to the legislation special fund can be used by WRS or WRS-branches to cover operation costs.

The responsibilities on the collection of ISF are assigned to WRS-branches in regions. It can distract the staff of operating organizations from carrying out their production functions and contributes to the manifestation of corruption. Also, mechanisms for ensuring transparency and targeted use of investments in the irrigation sector from the state budget and water users are poorly developed.

According to the WRS, the annual fund allocated from the state budget to WRS (for implementing activities on off-farm level) covers no more than 20% of what is needed.

Regular delays in financial receipts from the state budget and from the collection of ISFs make it difficult to carry out activities to prepare the irrigation and drainage network for the irrigation season and lead to a deterioration in the quality of irrigation services.

Table 2. WRS funding and unit costs (KGS)

	2018	2019	2020	2021
Full WRS cost (KGS)	**1 327 421**	**1 259 110**	**1 095 141**	**1 180 832**

[5] *OECD*. Overview of the use and management of water resources in Central Asia: A discussion Document (May 27, 2021). Retrieved Aug 2022, from here

State budget (Central office + 7 Oblasts + 40 RVK + 3 reservoirs)	1 248 043 948	1 165 567 322	1 013 684 426	1 071 467 301
Special fund (7 Oblasts + 40 RVK + Kirov reservoir)	79 377 052	93 542 178	81 456 974	109 364 699
Water delivered (m3)	4 817 000 000	4 920 700 000	4 942 000 000	4 986 900 000
Unit water cost (KGS/m3)	0,00	0,00	0,00	0,00
Unit cost State budget (KGS/m3)	0,26	0,24	0,21	0,21
Unit cost Special Fund (KGS/m3)	0,02	0,02	0,02	0,02
Length of off-farm canals (km)	5 769	5 769	5 769	5 769
Unit cost (KGS/km)	230	218	190	205
Unit cost State budget (KGS/km)	216 336	202 040	175 712	185 728
Unit cost Special Fund (KGS/km)	13 759	16 215	14 120	18 957
Total command area of all WRS schemes (ha)	1 023 864	1 023 864	1 023 864	1 023 864
Minimum overhaul costs (from pilot projects, USD/ha)[1]	62	62	62	62
Estimated off-farm rehabilitation costs (WMIP, USD/ha)[2]	300	300	300	300
Minimum overhaul costs (from pilot projects, USD)	62 991 990	62 991 990	62 991 990	62 991 990
Estimated off-farm rehabilitation costs (WMIP, USD)	307 159 200	307 159 200	307 159 200	307 159 200
Annuity minimum overhaul costs (USD, 6%, 30y)	4 576 300	4 576 300	4 576 300	4 576 300
Annuity estimated off-farm rehabilitation costs (USD, 6%, 30y)	22 314 782	22 314 782	22 314 782	22 314 782
Annuity minimum overhaul costs (KGS, 6%, 30y)	306 612 069	306 612 069	306 612 069	306 612 069
Annuity estimated off-farm rehabilitation costs (KGS, 6%, 30y)	1 495 090 363	1 495 090 363	1 495 090 363	1 495 090 363
Unit cost at full cost incl. overhaul (KGS/m3	0,06	0,06	0,06	0,06

Unit cost at full cost incl. rehabilitation (KGS/m3	0,31	0,30	0,30	0,30
Normal water fee (KGS/m3)	0,03	0,03	0,03	0,03
Reduced water fee for mountainous area (KGS/m3)	0,02	0,02	0,02	0,02
Off-season water fee (KGS/m3)	0,01	0,01	0,01	0,01
Proceeds from water fee collection (KGS)	76 201 970	90 735 913	79 827 835	106 083 758
Average actual water fee (KGS/m3)	0,0158	0,0184	0,0162	0,0213

1 Based on the WRS data

2 Based on estimates from MWIP

The water fee for off-farm water delivery by WRS to WUAs is KGS 0.01-0.03/m3; but actual fee collection in 2021 amounted to KGS 0.0213/m3 only and was higher than in previous years. For full recovery of all WRS costs, at least KGS 0.28/m3 would be required. The proceeds of the water fees go to the State Budget; in part they become available to WRS.

In case of full rehabilitation of off-farm systems at the rate of USD 300/ha as foreseen by the World bank Water Management Improvement Project (WMIP), water fees would need to become KGS 0.62 to recover these rehabilitation costs and recover the full running costs of WRS.

According to the results of OECD recent analysis of irrigation sector of Central Asia point to the damaging consequences of under-funding recurrent MOM costs, which result in a 'vicious circle' of unreliable service, premature obsolescence of assets, users' dissatisfaction and unwillingness to pay for water, a further weakening of cost recovery, and the need for major rehabilitation. The main obstacles to raising tariffs have been considered to be the low level of farm incomes and a lack of political will.

Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic (MNRETS). The annual State Budget and Special Fund contributions to the MNRETS for 2017-2020 are summarized below.

Table 3. Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic expenditures from State Budget and Special Fund 2013-16 (thousand KGS)

Year	**State Budget**		**Special Fund**		**Total**
2017	208,128	39%	324,922	61%	533,049
2018	230,160	38%	382,378	62%	612,538
2019	314,814	38%	514,552	62%	829,367
2020	354,836	43%	465,404	57%	820,241

At the request, the MNRETS supplied the costs that this organization incurred specifically for water management for the period 2017-2020. They are as follows:

Table 4. MNRETS expenditures specifically for water management 2017-2020 (thousand KGS)

Year	Water management	Percentage of total
2017	8,505	
2018	10,961	2.1%
2019	16,050	2.6%
2020	54,723	6.6%

Source: MNRETS/SAEPF

In recent years the water management expenditure of MNRETS amounted to some 6-7% of the total expenditure of the Ministry/Agency.

In 2020 these expenditures were used for: (a) The reconstruction of the sewer system of multi-story houses; (b) The construction of modern sewage treatment plants; (c) The reconstruction of the feed channels of irrigation networks and the well in Bishkek to provide irrigation water for green spaces; (d) The laying of pipelines; (e) The installation of the irrigation system of the Osh regional hospital; (f) Decontamination of household waste the northern shore of Lake Issyk-Kul. In the other years similar projects were financed: repair of sewage systems, irrigation systems for green spaces, treatment plants, equipment, protection of well fields, water supply networks, protection of springs, construction of septic tanks, improvement of pumping stations, cleaning of Lake Issyk-Kul, etc.

Ministry of Health of the Kyrgyz Republic (MoH). The annual State Budget and Special Fund contributions to the Ministry of Health for 2017-2020 are summarized below:

Table 5. Ministry of Health expenditures from State Budget and Special Fund 2017-2020 (thousand KGS)

Year	State Budget		Special Fund		Total
2017	1,910,268	76%	617,697	24%	2,527,965
2018	2,366,300	77%	704,564	23%	3,070,864
2019	2,329,499	75%	790,200	25%	3,119,699
2020	2,367,795	75%	768,972	25%	3,136,767

The Department of Prevention of Diseases and the State Sanitary and Epidemiological Surveillance is a subordinate unit of the Ministry of Health and ensures the sanitary and epidemiological supervision of drinking water suppliers.

At the request of the consultant, the MoH supplied the costs that Department of Prevention of Diseases and the State Sanitary and Epidemiological Surveillance incurs specifically for water management.

The annual salary cost of the specialists working in the drinking water sector in 2020 was KGS 2,517,120, the annual salary cost of sanitary physician's assistants was KGS 4,110,192. The total payroll of the Department for specialists was KGS 6,627,312. Per year the water laboratory of the Department carries out 34,000 tests, with a total cost of KGS 57.8 million. The total annual costs of the Department for the water sector are KGS 64.4 million, equivalent to 2% of the budget of the MoH.

Ministry of Emergency Situations of the Kyrgyz Republic (MES). The annual State Budget and Special Fund contributions to the Ministry of Emergency Situations (MoES) for 2017-2020 are summarized below:

Table 6. Ministry of Emergency Situations expenditures from State Budget and Special Fund 2017-2020 (thousand KGS)

Year	State Budget		Special Fund		Total
2017	1,321,171	99%	7,303	1%	1,328,474
2018	1,708,130	99%	11,277	1%	1,719,407
2019	1,988,991	99%	10,219	1%	1,999,210

2020	2,127,115	99%	13,298	1%	2,140,414

At the request, the MoES supplied the costs that this Ministry incurs specifically for water management (excluding for Hydromet, see below). Water management for this ministry pertains to flood control though river bank strengthening and river protection. These costs amount to some 80% of the total costs of the ministry. Oblasts which require high annual interventions for flood control are Batken, Jalalabad and Osh.

Table 7. Ministry of Emergency Situations expenditures for wages and flood control 2017-2020 (thousand KGS)

		Central office	Batken	Jalalabad	Osh	Issyk-Kul	Naryn	Talas	Chui	Total	%
2017	**Total**	**3,720,200**	**16,875,629**	**40,591,500**	**20,910,600**	**7,452,459**	**12,316,972**	**11,911,200**	**52,288,803**	**166,067,363**	
	Wages and admin.	3,720,200	2,102,631	3,665,900	3,333,500	1,553,259	2,504,072	1,313,000	2,108,800	20,301,362	12%
	Flood control		14,772,998	36,925,600	17,577,100	5,899,200	9,812,900	10,598,200	50,180,003	145,766,001	88%
2018	**Total**	**5,151,800**	**30,496,283**	**50,807,195**	**19,731,843**	**7,641,672**	**5,511,455**	**5,621,400**	**13,803,057**	**138,764,705**	
	Wages and admin.	5,151,800	3,507,307	5,132,800	3,524,800	2,311,972	3,866,755	1,773,800	2,643,400	27,912,634	20%
	Flood control		26,988,976	45,674,395	16,207,043	5,329,700	1,644,700	3,847,600	11,159,657	110,852,071	80%
2019	**Total**	**5,396,845**	**29,797,133**	**60,325,664**	**24,169,797**	**5,914,257**	**5,327,774**	**5,401,469**	**7,283,281**	**143,616,220**	
	Wages and admin.	5,396,845	3,260,233	5,349,764	4,614,697	2,311,957	3,804,574	1,875,669	2,650,381	29,264,120	20%
	Flood control		26,536,900	54,975,900	19,555,100	3,602,300	1,523,200	3,525,800	4,632,900	114,352,100	80%
2020	**Total**	**4,948,374**	**35,355,140**	**41,199,702**	**14,020,560**	**6,981,141**	**5,459,853**	**5,330,117**	**14,078,210**	**127,373,097**	
	Wages and admin.	4,948,374	3,212,040	5,369,653	4,691,177	2,197,846	3,656,453	1,830,117	2,713,068	28,618,728	22%
	Flood control		32,143,100	35,830,049	9,329,383	4,783,295	1,803,400	3,500,000	11,365,142	98,754,369	78%

Source: MoES data

The Agency on Hydrometeorology (KyrgyzHydromet) is accountable to the Ministry of Emergencies of the Kyrgyz Republic and is responsible for conducting systematic observations of hydrological, meteorological, agro-meteorological conditions and condition of crops and pasture vegetation, pollution of surface waters, soil and air including radioactivity levels. It is responsible for collection, analysis, and compilation of the information for the whole of the Kyrgyz Republic and ensuring its availability within and outside of the country. Hydromet operates a system of 'hydroposts' for monitoring river levels throughout the country. It also undertakes water quality sampling at locations on rivers throughout the country, although in less locations and less frequently than in the past (OECD 2016).

The annual State Budget and Special Fund contributions to Hydromet for 2017-2020 are summarized below, showing a growing contribution from the Special Fund:

Table 8. Hydromet expenditures from State Budget and Special Fund 2013-16 (thousand KGS)

Year	State Budget		Special Fund		Total
2017	64,708	98%	1,268	2%	65,976
2018	86,222	98%	1,475	2%	87,697
2019	119,776	98%	2,690	2%	122,466
2020	129,078	96%	5,117	4%	134,195

KyrgyzHydromet employs 129 persons for hydro-meteorological monitoring.

Ministry of Foreign Affairs of the Kyrgyz Republic (MES). The Commonwealth of Independent States' department of the Ministry of Foreign Affairs (MoFA) is in charge of the foreign policy toward member states of the CIS within regional international organizations such as the CIS, the Eurasian Economic community, the Organization of the Treaty by collective security, and also the International Foundation of saving Aral Sea, the Intergovernmental Co-coordinating Water Commission (ICWC). The ICWC is a parity collective body of Central Asian States acting on the basis of equity, equality and consensus. According to the Decision by the Heads of State of March 23, 1993, ICWC was included in the International Fund for saving the Aral Sea and has the status of an international organization. No budget information is available for the MoFA or on its water-related activities.

Ministry of Justice of the Kyrgyz Republic is an institution of executive power that ensures the functions of the state policy in the field of legal regulation, forensic, legal and notarial activity, ensuring registration within the granted powers. No budget information is available on its water-related activities.

National Statistical Committee of the Kyrgyz Republic (NSC) is the state body that carries out state statistical activities and coordinates activities in the field of accounting and statistics throughout the Kyrgyz Republic. Unclear remains what their own costs are to collect this type of information.

Centre for Standardization and Metrology operates under the Ministry of Economy and Commerce of the Kyrgyz Republic. The main activities of this center pertaining to metrology are calibration, verification, and testing of metrology equipment. No budget information is available on its water-related activities.

Public institutions

Water Users Associations. According to the Water Users Law or Water Users Associations (WUA), which recognized a clear following separation between governance and management: (a) the Water Resources Service is responsible for the operating and maintaining irrigation systems on the off-farm level and suppling irrigation water, and (b) the WUAs are responsible

for on-farm infrastructure and for receiving irrigation water from the off-farm system and delivering this water to the end water users.

At the end of 2021, 490 WUAs registered, which serve and provide irrigation water for 750 thousand hectares of irrigated land or about 73% of the national level. According to the information of the WRS WUA support Unit there are 705 systems (on-farm area) that are on the balance of WUAs, WUA Federations, rural administrations, etc.

At the same time, most of the on-farm irrigation infrastructure is at a fairly low level, which leads to large water losses (27.6% on the national level), which does not allow to meet the needs of water users.

The WUA budget is formed from membership fees (500-1200 KGS/ha) from water users and supplied irrigation services for water users (0.05-0.3 KGS/m3), which allow covering only operational and administrative costs of the WUA (salaries of the director and accountant) and only a small part is allocated for current repairs and maintenance of on-farm irrigation network canals.

Every year, the WUAs cover not more than 5% of the need for overhaul and rehabilitation of on-farm networks. In order to fully cover the need for these expenditures, an increase in irrigation service fees (ISF) by 250-300% will be required, which will entail a sharp increase in prices of agricultural products and will reduce their competitiveness.

Thanks to the support of donors, 136 (27%) WUAs out of 496 rehabilitated their on-farm irrigation system on revolving mechanism established by the Government. But within the existing system of WUA management, this kind of investment support also has low efficiency. The indicator is the ability of the WUA to ensure the implementation of the investment program within its own capabilities, as shown below (**Error! Reference source not found.**).

Table 9. Information on the repayment by WUA of the loan funds (WB) taken to rehabilitate and operate on-farm irrigation system (2012-2018)

Loan type	Loan repayment targets, KGS mln	Actual loan repayment figures, KGS mln	Loan repayment level, %
Credit for construction and rehabilitation of on-farm irrigation system	691.0	110.0	15,9%

Source: WRS WUA support unit

As shown in table, WUAs do not provide effective management of investment and credit funds. The state, attracting resources to support the WUA, does not accompany and does not control the tariff policy and the policy on the administration of credit funds.

Development institutions

The Kyrgyz Republic since gaining sovereignty until now, with the support of various development institutions (World Bank, ADB, EBRD, IFAD, USAID, UNDP, FAO, GIZ, etc.) has supported the water sector (irrigation) in such areas as: (a) rehabilitation of irrigation systems (on and off-farm levels), (b) emergency measures in case of floods; (c) water resource management, (d) drinking water, and (e) legislative and institutional changes.

During the last six years, the Kyrgyz Republic attracted more than USD 632.4 million for the needs of the water sector from international organizations, financial institutions and donor countries. Projects have been implemented and are implementing in two directions: (1) Improvement of water resources management system, creation of basis for IWRM implementation (2) Improvement of infrastructure (irrigation and drinking water, water sanitation) and management of water management systems.

Most part of this support was provided as a grant support, and other part a credit on concessional terms. The support provided by the development institutions allows to cover the deficit of considerable part of state expenditures in the water sector.
There is no practice of private sector participation in financing the country's water sector.

1.2. Analysis of infrastructure ownership, collection and use of the water tax or fees

Irrigation infrastructure systems and its **ownership**/MOM responsibilities were divided in the following categories:

(1) Main and off-farm irrigation Infrastructure. These include irrigation infrastructure that distribute water from a source to a tertiary system (Table 10). Main systems consist of structures for the storage, diversion and delivery of water, as well as the main drainage system for removal of return flows. These structures typically include: local storage reservoirs, pump stations, diversion weirs, main canals, main control structures, such as regulating gates and weirs. In addition, these include off-farm canals that deliver water to groups of water users such as WUAs and WUA Federations. Most basin and sub-basin (off-farm) irrigation systems are government-owned and operated by WRS.

Table 10. State irrigation and reclamation facilities Water Resources Service (2021)

Name of irrigation system	Units	Need for repair/ investment
Off-farm irrigation canals, km	5885	2143 (36.4%)
Water reservoirs, units	33	14 (42.4%)
Seasonal, daily and ten-day regulating water basins, units	60	43 (42.4%)
Hydraulic structures, units	7670	5752 (75%)
Pumping stations, units	115	81 (70.4%)
Collector and drainage system, km	1187.1	946 (79.7%)

Source: WRS materials

(2) On-farm systems. These include the irrigation infrastructure that previously supplied irrigation water to the fields of the collective and state farms. With the breakup of the collective and state farms these on-farm canals and other control structures serving approximately 756,754 ha or 74% of total irrigated area have been transferred to the balance of the WUAs and WUAFs (Table 11). Most of the WUAs have the on-farm irrigation infrastructure have been transferred to their balance. Other few entities that still has a number of on-farm Irrigation infrastructures on their balance are village governments and WUAs, which are under the transferring processes.

Table 11. On-farm irrigation and reclamation facilities under the WUAs (2021)

Name of irrigation system	Units	Need for repair/ investment
On-farm irrigation canals, km	28 737	14 563 (50.7%)
Daily and ten-day regulating water basins, units	339	76 (22.4%)
On-farm hydraulic structures, units	25 148	19 483 (77.5%)
On-farm water wells, units	2 871	2 210 (77%)
Collector and drainage system, km	5 055	4 678.1 (92.5%)

Source: WRS materials

To date the funding of development and maintenance of water infrastructure is performed using the **water fees** - economic instruments tariffs, taxes and transfers as follow:

- Payment for Use of Surface Water Resources (tariff);
- Payment for irrigation water supply services, and other irrigation services (tariff);
- Payment for water supply and sewerage services provided to households and industrial users (tariff);
- Subsidies from the state budget (taxes);
- Compensations for damages (transfers);
- External loans and donor support (transfers).

No water-related payments are made by the hydropower sector or the transport sector.

The regime for paid water use in the Kyrgyz Republic's irrigation sector began operating in 1996, but gained final legal effect in 1999 under the law «On setting of tariffs for drinking water supply services» (1999). Since 2010, the tariff rates for irrigation water supply are at the level of no more than KGS 0.03/m³, for water users in the industry and energy sectors at KGS 0.10/m³, and for the entities of science, culture, education and health at KGS 0.01/m³. Such low rates were approved to stimulate the agricultural sector. They cover a very small share of the real costs of operation and maintenance of water management systems. But since the establishment of the tariff, the total actual costs have multiplied. And if in 2013 they amounted to KGS 719.1 million, in 2020 it was already KGS 1 billion 212 million. Tariffs for water supply services were initially based on the actual costs of water management systems.

To date, the scheme of interaction between the state and irrigations water users is as follows.

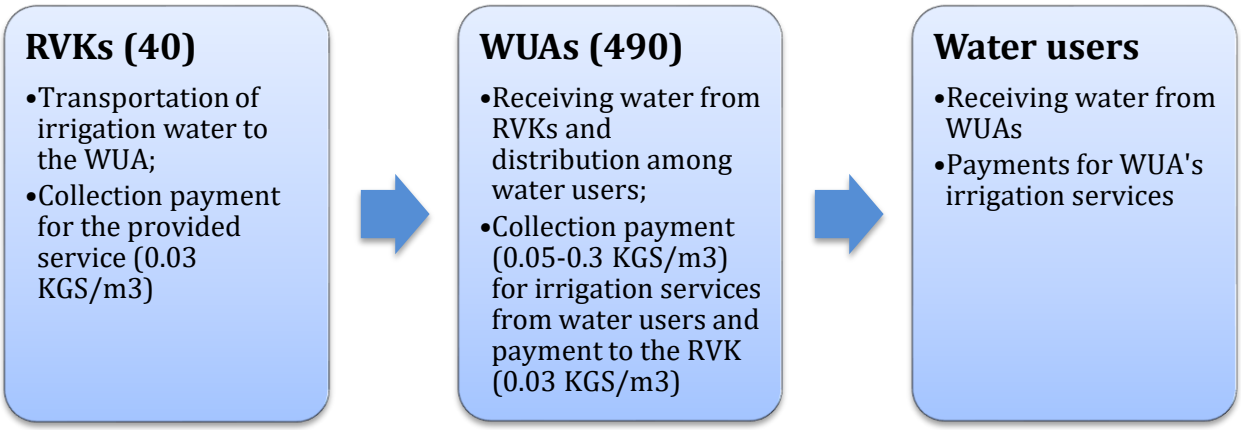

Figure 1. Irrigation service supply scheme

Irrigation Service Fees for off-farm water supply were kept low for an extended period with a reference to the inability of the rural population to pay more. These low rates have contributed to the widespread degradation of the irrigation networks. The actual amount of fees collected by WRS in 2021 amounted to KGS 106,1 million (no more than 9% in total budget of the WRS), whereas the total expenditure of the department was KGS 1.2 billion. As a result, the Government of the Republic has to allocate annual irrigation subsidies (no less than 90% of WRS expenditures) from the public budget and has applied for external support measures. Since 2000 the public budget covered on average about a quarter of the cost of maintenance of the off-farm irrigation network. For example, donor support from the European Union compensated for about 20% of annual expenditures. The loans provided by the World Bank and the Asian Development Bank for the rehabilitation of irrigation canals and facilities filled a significant gap of the irrigation budget.

In addition to that, at the present level of ISF tariffs (not more than 0.03 KGS/m³ for water supply by the WRS and a tariff rate for WUA members at the level of 0.05-0.3 KGS/m³ in 2020), the share of costs for payment for water supply services is of little importance in the cost structure of water users of agrarian sector - not more than 6-9% of the total expenditure budget items of the water users - farms. This factor does not help to intensify measures for rational use of water

resources by water suppliers and consumers. As for the costs for maintaining their own irrigation network, for the vast number of water users of the agricultural sector of the Kyrgyz Republic they are mainly related to the annual cutting of temporary sprinklers and irrigation furrows for the surface irrigation methods.

As the key water user entities in the agrarian sector of the Kyrgyz Republic are WUAs, it is appropriate to reflect some aspects of their economic activity. Revenues of WUAs' budgets are formed by the first shares of members of these associations. Size of shares is set according to their Charters, based on the decision of the WUA's members board meetings. Estimated size of shares at present constitutes, on average, about 800-1,200 KGS / hectare per year, but traditionally not more than 67% of the planned amount is collected. Low collection rate of shares is the most difficult problem for the most of WUAs and negatively impacts on the state of on-farm irrigation network. Part of the collected funds is used to pay for water supply services of local WRS on the basis of contracts and approved tariffs (0.03 KGS/m3).

The remainder of the fees is used to finance WUA's own production activities, including MOM of irrigation infrastructure, as well as current repairs of canals and facilities. In 2020 for current repairs were allocated 33% of the total costs of WUA for the MOM purposes. In the period from the beginning stage of formation of WUAs and to date, the vast majority of work on the rehabilitation and development of on-farm infrastructure facilities was financed at the expense of internal credit and donors support.

The acute investment deficit is typical for the sector of domestic water supply and sanitation. According to OECD estimates, in order to ensure overall access to improved systems of water supply, sewerage and sanitation, at least KGS 20 billion will be required, while the annual capital expenditure on water supply and sanitation does not exceed KGS 3.5 million (0.23% of the national budget expenditure). The sales revenues of water utilities often cover only 80-85% of the costs incurred (for example, water utilities of Balykchi and Karakol in 2010).

Therefore, progress in improving access to drinking water is achieved primarily through the implementation of projects supported externally by the Asian Development Bank, the World Bank, the European Bank for Reconstruction and Development, German Agency for Development and Co-operation (GIZ), Swiss Agency for Development and Co-operation (SDC) and other donors, whose total investment over the past decade was over 180 million US dollars. Based on calculations performed in the framework of National Policy Dialogue on financing water supply and sanitation in the Kyrgyz Republic, it was found that even extreme measures such as increasing fees for water supply and sanitation up to 2.5% of average household income and increasing budget funding of the sector up to 2% of the expenditure of the public budget would not allow for fully achieving the Sustainable Development Goals, without substantial external support.

The legal framework for financing water protection measures is specified in Article 15 of the Law «On Environmental Protection»; it provides that natural resources (including water) are used on paid basis: this includes fees for the use of natural resources, and the charges for pollution and other negative environmental impacts. Payments for environment pollution are regulated by the law of the Kyrgyz Republic «On the rates of environmental pollution charges» and «Instructions and guidelines on the definition of environmental pollution charges» adopted by the Government of the Kyrgyz Republic. The rate of environmental pollution charges is set at 1.2 KGS for an equated ton of pollutants and is charged from the users of natural resources performing the following types of impact on the environment:

- Air pollutant emissions from stationary and mobile sources,
- Discharges of pollutants to surface water bodies and groundwater fields,
- Waste disposal.

Payment of pollution charges does not exempt the users from the obligation to implement environmental protection measures, as well as from penalties for environmental rules violations

and compensation for damage caused by the environment pollution, to the economy, health and property of citizens. However, the analysis of statistical data on the results of collecting such charges since 2006 shows that the share of receipts from water- related pollution charges is not more than 10% of the total amount of pollution charges; and in monetary terms it does not exceed KGS 3 million per year. These incomes go to the State Budget, the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic (MNRETS) former State Agency of Environmental Protection recommends how to use these funds. One should note that most of these funds are actually used to cover administration costs of environmental protection bodies rather than for funding water protective measures. In fact, the lack of investments typical of all water-consuming sectors of the national economy is a key factor hindering the development of the water sector in the Kyrgyz Republic.

Tariff rates in the water sector are low that they cannot prevent the most wasteful and unproductive use of water. The projected effects of climate change, in particular the reduction of water resources, can lead to frequent conflicts between water users over water.

2. Conclusions and recommendations

A review of other studies, legislation, and financial and economic indicators of the water sector of the Kyrgyz Republic shows that there are significant gaps in infrastructure operation and maintenance, water resources management, financing and cost recovery of the sector, and a lack of human capacity, as grouped below:

- Poor system maintenance. The Kyrgyz Republic has witnessed a sustained deterioration of its irrigation infrastructure over the past 30-40 years. Underfunding, together limited institutional capacity and obsolete system design, have resulted in poor maintenance of irrigation systems. This, in turn, has led to a decline in water diversions and a reduction in the irrigation area (which Is now smaller than it was in 1990). Although the World Bank, ADB, EBRD, GIZ, FAO, IDB, USAID and other development institutions have invested in the rehabilitation of tertiary systems, there remains a considerable maintenance backlog at both main and tertiary levels.
- Poor system operations. The limited reliability of water delivery at tertiary levels (and probably also main system level) is a constraint to farm productivity and is often caused by suboptimal operation of irrigation systems. Common causes of poor operation are: (1) poor scheduling of irrigation cycles (application duration and return intervals), and (2) poor regulation of delivery flow rates (i.e. farm off-take flow rates are either above or below the required discharge rate) due to operator error or inadequate equipment.
- Too low allocations from State budget that do not allow to ensure the financial and physical sustainability of irrigation infrastructure,
- Water tariffs collected from water users are too low and insufficient to cover the MOM costs at the off- and on-farm levels and this fact is the main reason for the irrational/wasteful use of water resources,
- Mechanisms of legal and economic responsibility of WRS branches in regions and water users for the fulfillment of contractual obligations for the supply of irrigation water are not regulated.
- Limited institutional capacity. Low and declining budgets have adversely affected the institutional capacity of WRS and other water management institutions. While there have been considerable efforts in the establishment of WUAs, there is still a need to increase their capacity to effectively and efficiently operate and maintain the tertiary infrastructure through, inter alia, asset management planning and planning and supervision of maintenance works.

These problems cannot be effectively and sustainably solved without competent sector policy and strategy, including improving sector financing and economic regulations, planning and proper, coordinated leadership at the national level. The need to make proper decisions on these issues stems from the fact that at present the responsibility for water management is distributed among numerous government organizations and there is no National Water Strategy.

Climate change and its implications for the water sector of the Kyrgyz Republic requires the government of the Kyrgyz Republic to take immediate action to:

- Improving water management system;
- Development and implementation of adequate financing, investment, PPP policy and economic regulation in water sector (revision of current water charges, taxes and fees) which will also unlock private capital to this sector; Create favorable tariffication and identify priority pilot projects/areas for private sector investment;
- Mobilizing resources from state budget and development institutions for the:
    - rehabilitation of critical irrigation infrastructure on the on- and off-farm levels; Strengthen accountability and enhance transparency in resource allocation;
    - capacity building activities for water institutions (public and private sector);
- Implementation of respective technologies/approaches for the adaptation of agri- and other systems to climate change (application of water-saving irrigation technologies); and reducing the risk of major water-related conflicts.

3. Needs assessment and development plan

This report was not intended that this assignment/report would make detailed needs assessment or recommendations upon the institutional structure, organization and responsibilities in relation to water resources management. Perhaps, the water sector financing gaps are also related to institutional and other issues of water management. Needs assessment on improving institutional things should be done in another assignment/research.

The Government of the Kyrgyz Republic approved:

- In 2017 the State Irrigation Development Program of the Kyrgyz Republic for 2017-2026, aimed for the construction of irrigation infrastructure to provide new irrigated land to rural residents
- In 2020 the Program Development of drinking water supply and sanitation systems in rural areas of the Kyrgyz Republic until 2026, aimed for the: construction/modernization of drinking and wastewater infrastructure in priority regions; improving the quality of water and wastewater services through improving regulatory framework, including tariff policy, institutional development of respective operators (state and public) and increasing the operational reliability of systems.

Table 12. State programs on development of irrigation (construction/rehabilitation) and drinking water supply sectors and sanitation systems

Name	Implementation period	Number of water facilities	Total cost of program implementation, USD million	Actual costs/committed, USD million	Note
State Irrigation Development Program of the Kyrgyz Republic for 2017-2026 Activities of the Program based on construction/ rehabilitation of irrigation infrastructure. The program does not contain any activities related to improving the regulatory policy of water resources management and tariffs; or the development of institutional capacity.	2017-2026	46	**713.4**	**259.1:** 30.09 from state budget (17 objects from 46 committed by donors and state budget)	Command area will be increased to 66.5 thousand ha
Program Development of drinking water	2020-2026	1 819	**573.6**		Drinking water supply to

supply and sanitation systems in rural areas of the Kyrgyz Republic until 2026 The program contains activities related to improving the regulatory policy of water resources management and tariffs; the development of institutional capacity of operators.					over 2,000,000 people living in rural areas
Total:			**1 287.0**		

Since the above state program on Irrigation development contains only certain measures and do not cover the whole country, it was decided to analyze the available data and make alternative calculations on the necessary investments for the irrigation sector (construction/rehabilitation) based on:

(1) FAO database on investment costs in irrigation;
(2) Estimated off-farm rehabilitation costs calculated by WB WMIP;
(3) Estimated costs calculated by WRS.

In 2003, FAO conducted a desk study collecting data on irrigation projects from various sources, with the FAO Investment Centre and the World Bank as the major data sources. Project appraisal reports, i.e. ex-ante cost estimates, represent the bulk of the sources of information of the study. Several hundreds of projects were studied and of these 248 projects were screened more in detail and investment costs were analyzed and presented in a standard format. And based on a desk study it has figured index for investment costs in irrigation USD 2000 per hectare of command area.

Table 13. Needs assessment costs (FAO Index: USD 2000 per hectare of command area)

Total actual command area of all schemes (ha)	1 023 864
Potentially irrigable command area, ha	1 287 303
Investment costs for actual command area, USD billion	**2.047**
Investment costs for potentially irrigable command area, USD billion	**2.575**

In 2006-2013, in the framework of the World bank Water Management Improvement Project rehabilitated/modernized irrigation infrastructure in several oblasts and after estimated actual average costs for rehabilitation of the off- and on-farm:

- off-farm level USD 300 per hectare;
- on-farm level USD 350 per hectare.

Table 14. Needs assessment costs (WB WMIP Indexes)

Total command area of all schemes (ha)	1 023 864	
Total command area of all WUA schemes (ha)	756,754 ha	
Total investment costs, USD billion	**0.345**	Off-farm: **USD 80 133 000**

		On-farm: **USD 264 863 900**

At the end of 2021, the WRS calculated estimated costs for rehabilitation of all irrigation infrastructure (off- and on-farm levels) in country. According to the received information these figures calculated by the engineers of the WRS.

Table 15. Needs assessment costs (WRS estimations, 2021)

Investment costs for rehabilitation of off-farm irrigation infrastructure, at least USD billion	**0.668**	Costs for 1 ha of off-farm command area: **USD 2 499**
Investment costs for rehabilitation of on-farm irrigation infrastructure, at least USD billion	**1.214**	Costs for 1 ha of on-farm command area: **USD 1 604**

Due to the lack of a national water strategy, it is not possible to define a precise list of activities for the development of the water sector and, accordingly, to develop a budget for the implementation of these activities.

At the same time, based on the identified problems and respective solutions (see chapter 2. Conclusions and Recommendations), was developed an action for the development of the water sector of the country with appropriate calculations. (See Annex 2).

The total budget for the implementation of the Action plan is USD 2 941.1 million or USD 68.1 million without construction/rehabilitation costs of the irrigation infrastructure.

Currently, the state budget does not have sufficient funds for the required capital investments in this sector, therefore the support of international donors will be needed in the medium term.

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Annexes

Annex 1

List of projects in irrigation sector financed/committed by the development agencies

No	Name of the project	Project implementation period	Project cost (million USD)	Source of financing	
	Completed or ongoing projects				
1.	Project "Development of the irrigation system Sarymsak"	2017-2021	13.25	IDB	
2.	Project "Development of irrigated lands in the Issyk-Kul and Naryn regions"	2021-2025	59.5	IDB	
3.	Project "Reconstruction of the irrigation system of the Kyrgyz Republic".	2018-2022	32.0	PRC (grant)	
4.	Improving agricultural productivity and nutrition	2016-2022	38.0	GAFS/WB	
5.	Additional funding for the project "National Water Resources Management"	2020-2022	4.49	WB	
6.	"Increasing the resilience of water resources to climate change and natural disasters"	2019-2023	43.6	ADB	
	Planned/Committed				
7.	Project “Climate Resilient Water Supply in the Kyrgyz Republic”	2022-2024	18.430	EBRD	
8.	“Improving water services that are resilient to climate change”	2022-2028	50	WB	The total cost of the project is $100 million, of which $50 million is a grant and $50 million is a loan. **Water Resources Service (USD 50 million)**

					Department for the Development of Drinking Water Supply and Sanitation (USD 50 million)
	Total		**259.27**		

Annex 2

Development plan

#	Priority areas	Measures/Actions	Cost, USD million	Expected result	Note
1	Improving water management	1.1. Capacity building for employees of water institutions (on the national and regional levels)	2.8		
		1.2. Improvement/introduction of economic instruments (water taxes, charges) in the water sector. Improvement of PPP in water sector. Support on their implementation and capacity building.	2.5	Increasing self-sufficiency of the water sector from state budget	
		1.3. Capacity building (institutional and technical) of five basin councils for main river basins	3.0		
		1.4. Upgrading an information center and a Unified National Water System. Support its work and capacity building.	8	Access to up-to-date databases and real-time monitoring	
		1.5. Updating water resources development, use and protection plans for the five main river basins, taking into account the Global Climate Change. Support on their implementation and capacity building.	3.5		
		1.6. Implementation of automation of irrigation water accounting and distribution on off- and on-farm systems and automation of settlements for services rendered. Conducting demonstration trainings.	4.8	Automatization of collection of data for monitoring and ensuring transparency on water accounting	
		1.7. Capacity building of water users and dissemination of information on Global Climate Change	0.8	Awareness on rational water using	
2	Improvement of water infrastructure	2.1. Improvement of irrigation development schemes with regard to climate change. Support on their implementation and capacity building.	7		

		2.2. Development and implementation support of the new program for the development of water-saving irrigation technologies (drip, sprinkler and others)	35		
		2.3. Rehabilitation/modernization of existing water infrastructure (irrigation and drinking water) and new development	2 875.0 2.047-irrigation 827.85-drinking water and sanitation		Based on FAO Index and State program Development of drinking water supply and sanitation systems
3.	Rational use of water resources	3.1. Review/update design and operational crop irrigation regimes for major river basins	0.5		
		3.2. Development of a legal packages on the using water resources as a natural resource	0.2	Introduction of a mechanism to regulate the use of water resources.	
	Total:		**2 941.1**		
	Subtotal (without p. 2.3)		**68.1**		

Water Sector Finaancing in the Republic of Tajikistan

By Jamoliddin Jalolzoda

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List of abbreviations

WUA	Water User Associations
ALRI	Agency for Land Reclamation and Irrigation under the Government of the Republic of Tajikistan
SUE "KMK"	State Unitary Enterprise of Public Utilities and Housing
PPP	Public private partnership
TC RT	Tax Code of the Republic of Tajikistan
NGOs	non-governmental organization
NDS-2030	National Development Strategy of the Republic of Tajikistan for the period up to 2030
OJSHC "Barki Tojik "	Open Joint Stock Holding Company “Barki Tojik ”.
PIP 2021-2025	Public Investment Program
MDP 2021-2025	Medium-term development program of the Republic of Tajikistan for 2021-2025
PSW	Permits for special water use
FS	Feasibility study
PP	Private partners

Introduction

The Republic of Tajikistan attaches great importance in the development of the water sector both at the national, regional and global levels. Tajikistan is the initiator of several global water initiatives and stands for the rational and efficient use of water resources.

Water is the main resource contributing to the achievement of the highest strategic goals of the country, including the acceleration of industrialization in the country, the achievement of energy and food security, as well as employment in rural areas of the country, which are defined in the National Development Strategy of the Republic of Tajikistan for the period up to 2030.

However, for the rational and efficient use of water resources, the water sector needs sustainable financing. Lack of funding leads to the deterioration of water infrastructure, which hinders the achievement of the intended goals. In addition, water not only contributes to the economic growth of the country, but it also has a destructive power associated with the frequency of natural disasters. This is especially observed in recent years under the influence of global climate change.

To improve the situation in the water sector, the Government of the Republic of Tajikistan adopted the Water Sector Reform Program for the period 2016-2025, as well as the following revised legal acts, including the Water Code of the Republic of Tajikistan dated April 2, 2020, No. 1688, Law of the Republic of Tajikistan "On Water Users Association" dated January 2, 2020, No. 1668, the Law of the Republic of Tajikistan "On Drinking Water Supply and Sanitation" dated July 19, 2019, No. 1633, etc., which regulate water relations in the water sector.

This reform is being implemented with the support of the Government of the Republic of Tajikistan and development partners. To attract funds within the framework of the water sector reform, the program provides for an action plan for the implementation of the water sector reform for 2016-2025.

Funding for the implementation of approved activities is planned at the expense of the centralized republican budget and development partners.

Unfortunately, financing of the action plan for the implementation of the reform is not provided at the expense of the private sector, although the private contribution of the sector plays an important role in the development of the water sector.

In this regard, within the framework of partnership with the CAREC Institute, a review of the state of financing of the water sector in Tajikistan and the possibility of attracting additional funds using the private sector and the mechanism of public private partnership will be carried out. Based on the results of the work, specific recommendations will be developed at the national level.

1. Investment policy and legal framework for financing the water sector

1.1. Investment policy

The Republic of Tajikistan, as a member of the world community, implements its political and economic relations in the international arena on the principles of partnership and mutually beneficial cooperation. The consistent efforts of the Government of the Republic of Tajikistan in this process were aimed at expanding cooperation with development partners and the world community.

The investment policy in the water sector in Tajikistan is formed and implemented on the basis of the National Development Strategy of the Republic of Tajikistan for the period up to 2030, approved by the decision of the Majlisi Namoyandagon Majlisi Oli of the Republic of Tajikistan dated December 1, 2006, No. 636 and the Medium-Term Development Program of the Republic of Tajikistan for 2021-2026, approved by the Decree of the Government of the Republic of Tajikistan dated April 30, 2021, No. 168, as well as programs for the socio-economic development of regions, cities, districts , industry strategies and programs.

To achieve the strategic development goals, the above documents, on a 5-year basis, a Public Investment Program is being developed. For example, for 2021-2025, by the Decree of the Government of the Republic of Tajikistan dated September 2, 2021, No. 358, the Public Investment Program for 2021-2025 was adopted.

Within the framework of this investment program, the goals of the Government of the Republic of Tajikistan regarding the improvement of favorable conditions for investment activities and the private sector are taken into account. Increasing the participation of the private sector in sectors of the national economy contributes to the generation of income, the reduction of poverty and the improvement of the well-being of the population of the country.

The basis for the development of this program is the Constitution of the Republic of Tajikistan, the Law of the Republic of Tajikistan "On State Forecasts, Concepts, Strategies and Programs for the Social and Economic Development of the Republic of Tajikistan", the National Development Strategy of the Republic of Tajikistan for the period up to 2030, the Medium-Term Development Program of the Republic of Tajikistan for 2021 -2026, Decree of the Government of the Republic of Tajikistan dated March 27, 2018 No. 161 "On the procedure for developing state investment projects and implementing public investment programs of the Republic of Tajikistan", sectoral and regional development programs of the country.

For example, in the action plans of the following sectoral, regional and country documents for the development of the country, investment projects in the water sector are indicated:

– Medium-term development program of the Republic of Tajikistan for 2021-2026, approved by the Decree of the Government of the Republic of Tajikistan dated April 30, 2021, No. 168;

– Programs for the socio-economic development of regions, cities and districts for 2021-2026;

– National Strategy for Adaptation to Climate Change of the Republic of Tajikistan for the period up to 2030 , approved by the Decree of the Government of the Republic of Tajikistan dated October 2, 2019, No. 482;

– The Water Sector Reform Program of the Republic of Tajikistan for 2016-2025, approved by the Decree of the Government of the Republic of Tajikistan dated December 30, 2015, No. 791;

– Program for the development of housing and communal services of the Republic of Tajikistan for 2021-2024, approved by the Decree of the Government of the Republic of Tajikistan dated February 27, 2021, No. 53;

– State program for the development of new irrigated lands and the restoration of lands that have come out of agricultural circulation in the Republic of Tajikistan for 2022-2027 dated March 1, 2022, No. 90;

– State program of bank protection works of the Republic of Tajikistan for 2018-2022, approved by the Decree of the Government of the Republic of Tajikistan dated May 30, 2018, No. 285;

– Measures to improve the ameliorative condition of irrigated agricultural lands of the Republic of Tajikistan for 2019-2023, approved by the Decree of the Government of the Republic of Tajikistan dated August 1, 2018, No. 374.

– The program for the development of land reclamation and irrigation until 2030 is under development.

To develop a program, ministries, departments and local executive bodies of state power of regions, cities, districts, organizations and institutions submit state investment projects based on the goals and priorities of the country's strategic documents, sectoral development programs, programs for the socio-economic development of regions, cities, districts and provide to the Ministry of Economic Development and Trade for inclusion in the draft program.

Further, an Interdepartmental Working Group is formed to evaluate project applications and is submitted to the Commission for the selection of public investment projects.

The Commission for the Selection of Public Investment Projects under the leadership of the First Deputy Prime Minister of the Republic of Tajikistan reviews and selects public investment projects for inclusion in the Public Investment Program of the Republic of Tajikistan.

The projects included in the program include investments from government agencies, departments and corporate structures. There are opportunities to finance a certain part of the costs at the expense of the state budget or guaranteed loans from the Government of the Republic of Tajikistan. Investment funds may have operating costs and technical assistance, provided they are considered an integral part of the project. Technical assistance projects are presented separately.

As part of the implementation of the water sector reform, international financial institutions and organizations have been assigned to basin zones to finance the modernization and rehabilitation of water infrastructure.

Also, single policy projects, improvement of the institutional structure of water resources management, water legislation and others are financed through loans, grants and the contribution of the Government of the Republic of Tajikistan.

1.2. Water Sector Reform in the Republic of Tajikistan

The Republic of Tajikistan at this stage has entered a transitional phase in the development of various sectors of the economy. With the support of financial institutions and development

partners, reforms of land and water management, as well as the water sector as a whole, have been actively launched in the country.

Issues of reform in the water sector have been considered since 2006. The main factor pushing for reform in this sector was the economic inefficiency or unprofitability of the water sector.

Also, the deterioration of the water infrastructure, which was built in the last century, has suffered significant wear and tear and has exceeded its service life by several times.

Decree of the President of the Republic of Tajikistan "Strategy for Reforming Public Administration Systems" dated March 15, 2006, No. 1713 actually laid the foundation for the reform in the water sector, which provided for the reform process in several stages.

Further, the "Agriculture Reform Program of the Republic of Tajikistan for 2012-2020" was adopted, adopted by the Decree of the Government of the Republic of Tajikistan dated August 1, 2012, No. 383, which, based on its action plan, provided for the 2012-2013 division of roles and responsibilities on policy development and regulation at the national level, as well as the creation of basin management of water resources and the Agency " Mirob ".

Decree of the President of the Republic of Tajikistan dated November 19, 2013 No. 12 "On improving the structure of the executive bodies of state power of the Republic of Tajikistan" was the legal basis for the start of reforming the water sector . In accordance with this Decree, the Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan was liquidated, political functions in the water sector were assigned to the Ministry of Energy and Water Resources of the Republic of Tajikistan, and irrigation and land reclamation duties were assigned to the newly created Agency for Land Reclamation and Irrigation under the Government of the Republic of Tajikistan.

Decree of the Government of the Republic of Tajikistan dated December 30, 2105, No. 791 "On the reform program of the water sector of the Republic of Tajikistan for 2016-2025" The Program for the Reform of the Water Sector of Tajikistan for the period 2016-2025 was approved.

The goal of the water sector reform is to create the basis for decentralizing the management system and assigning part of the operation functions in the process of sharing responsibility between ministries and departments and partly non-governmental organizations. The proposed reform is based on the general guiding principles of IWRM and emphasizes the issues of social, economic interests and the environment through sustainable sustainable management and development of water resources.

The implementation of the water sector reform program also provides for the creation of basin councils in river basins, so that both industry partners and interested civil communities have equal participation and work closely in the process of planning and implementing programs for the regulation, distribution and use of water, monitoring the progress of programs, resolving disputes between water users.

At the grassroots levels, service providers (water supply, irrigation and others) ensure the participation of water users in the planning and distribution of water, taking into account the needs of the population and the availability of water resources.

To implement the reform program, an action plan for the implementation of the water sector reform from 2016 to 2025 is provided. This plan mainly includes the following activities:

- Development of Legislation and Regulation
- Institutional development

– Rehabilitation of infrastructure
– Auxiliary means of water sector reform

Financing of activities is planned at the expense of the centralized republican budget and the support of development partners. The total cost of the events is 1.80 billion somoni. Including from the state budget 168.8 million somoni and 1.63 billion somoni.

The action plan for the implementation of the water sector reform in the Republic of Tajikistan in 2016-2025 is given in Appendix 1 of this report.

1.3. Legal framework for financing the water sector

The Law of the Republic of Tajikistan on the state budget of the Republic of Tajikistan, which is adopted annually, is the main legal norm that determines the revenue, expenditure, and deficit of the state budget. This law regulates the receipt and financing of various budgetary organizations, as well as the servicing of external debt.

Based on this law, financing of the water sector infrastructure for various budgetary organizations is carried out from the following sources:

– at the expense of the state budget;
– at the expense of the local budget;
– at the expense of special funds;
– at the expense of capital construction funds;
– through loans and grants from international financial institutions and international organizations.

Financing of water infrastructure at the expense of the local budget, at the level of districts and cities, is carried out by local government bodies, at the expense of a part of the budget allocated by the state.

Sectoral organizations of the water sector, at the expense of allocated funds and if there are special accounts, operate and maintain the water management infrastructure.

Also, the basis for the allocation of funding are state sectoral programs, programs for the socio-economic development of districts, cities and regions, as well as the tasks set for sectoral organizations during study tours to facilities by the Government of the Republic of Tajikistan.

The contribution and financing of the private sector in the development of water management is mainly determined in the programs of socio-economic development of districts, cities and regions. The contribution of the private sector is the construction of individual wells to provide drinking water to settlements that do not have centralized water supply or irrigation water to irrigate their dekhkan farms.

In addition, the contribution of the private sector is observed in irrigated lands in high mountainous areas, where there are no structural units of water management organizations. The operation and maintenance of such mountainous irrigation canals is fully funded by the dekhkan farms of the local communities.

In general, water infrastructure is mainly in balance of:

– Ministry of Energy and Water Resources of the Republic of Tajikistan (water facilities transferred to the balance of the Tajik branches of BWO "Amudarya" and BWO "Syrdarya");

– Committee for Environmental Protection under the Government of the Republic of Tajikistan (gauging stations on the balance sheet of the Agency for Hydrometeorology);

– Agency for Land Reclamation and Irrigation under the Government of the Republic of Tajikistan (irrigation reservoirs, land reclamation and irrigation systems, irrigation, observation and vertical drainage wells, mudflows, as well as bank protection structures);

– Forestry Agency under the Government of the Republic of Tajikistan (irrigation facilities intended for the development of forestry);

– Service for State Supervision of Safe Work in Industry and Mining Supervision under the Government of the Republic of Tajikistan (some objects of the deposit of medicinal, mineral and thermal waters);

– Main Department of Geology under the Government of the Republic of Tajikistan (observation wells);

– State Unitary Enterprise " Khojagii " manziliyu komunali" (drinking water supply and sanitation infrastructure);

– OJSHC "Barki Tojik " (reservoirs for hydropower and irrigation purposes)

– Associations of water users (on-farm land reclamation and irrigation facilities);

– Local government authorities, including water supply and sewerage systems of cities and districts of Dushanbe, Khujand, Rogun, Nurek, Sarband. There are also sayi (temporary/seasonal rivers) on the balance sheet of local authorities;

– Public canals in mountainous areas maintained by the local community.

1.4. Legal Framework for Private Sector Participation in Water Sector Financing

The state policy in the field of economic development is aimed at comprehensive support of initiatives of the private sector and entrepreneurship, and in this direction, significant measures have been taken to eliminate artificial administrative barriers and ensure the transparency of legal norms in relation to business entities.

Laws of the Republic of Tajikistan "On State Protection and Support of Entrepreneurship" dated July 26, 2014 No. 1107 as amended in 2020, "On Investment Agreement" dated March 19, 2013 No. 944 as amended in 2017, "On the Permit System" dated August 2, 2011 No. 751 as amended in 2021, "On the moratorium on inspections of the activities of business entities in the areas of production" dated February 21, 2018 No. 1505. The concept of state policy for attracting and protecting investments of the Republic of Tajikistan and a number of sectoral strategies and programs. Also, amendments and additions were made to a number of regulatory legal acts, which is aimed at attracting investment and business development.

The participation of the private sector in the water sector is regulated by the following legal documents, including Law of the Republic of Tajikistan "On public-private partnership " dated December 28, 2012, No. 907, Water Code of the Republic of Tajikistan dated April 2, 2020, No. 1688, Law of the Republic of Tajikistan "On drinking water supply and sanitation" dated July 19, 2019, No. 1633 , the Law of the Republic of Tajikistan "On Water Users Association" dated January 2, 2020, No. 1668 and other regulatory legal acts in the field of PPP.

The State Committee for Investments and State Property Management of the Republic of Tajikistan, in accordance with the Decree of the Government of the Republic of Tajikistan dated

June 3, 2013, No. 250, is designated as the authorized body in the field of public-private partnership.

Also, by the Decree of the Government of the Republic of Tajikistan dated July 2, 2013, No. 289, the State Institution "Center for the Implementation of Public-Private Partnership Projects" was established. This state institution was created with the aim of developing the country's infrastructure through the implementation of mechanisms for attracting private investment in the implementation of social projects. The director of the public institution is the secretary of the Public-Private Partnership Council.

By the Decree of the Government of the Republic of Tajikistan dated July 2, 2013, No. 290 "On the Council for Public-Private Partnership" (as amended by the Decree of the Government of the Republic of Tajikistan on December 30, 2015 No. 823), the Council for Public-Private Partnership was established.

The Chairman of the Council is the First Deputy Prime Minister of the Republic of Tajikistan, the Chairman of the State Committee for Investments and State Property Management of the Republic of Tajikistan is the Deputy Chairman of the Council.

The members of the Council are the ministers of the Ministry of Justice, Finance, Economic Development and Trade, the chairmen of the State Committee for Land Management and Geodesy, the Committee for Architecture and Construction, and the heads of the central body or the executive body of local government, which have the authority to enter into agreements with private partners under the PPP law .

1.4.1. Law of the Republic of Tajikistan "On public-private partnership"

The Law of the Republic of Tajikistan "On public-private partnership" is the main regulatory legal act that defines the legal, economic and organizational foundations of public-private partnership, the procedure for implementing public-private partnership projects in the field of infrastructure and social services, and also protects the interests of the state and private sector is

This law applies to all public-private partnership projects in the field of infrastructure and social services implemented by public authorities and the private sector in accordance with a public-private partnership agreement.

Infrastructure projects are understood as: the design, construction and use of a new infrastructure facility or the reconstruction, modernization, expansion and operation of any existing infrastructure facility.

Social service projects are understood as: the design, development and operation of any structures that directly or indirectly provide social services to the public for a period of at least three years (household, medical, psychological, pedagogical and other services), which before the start of the project were under the jurisdiction of the customer organization.

Infrastructural facilities and social services, in respect of which this Law does not apply, are determined by the Government of the Republic of Tajikistan.

However, it should be noted that this law does not apply to:

– purchase of goods, performance of works and provision of services in accordance with the Law of the Republic of Tajikistan “On public procurement of goods, works and services”;

– privatization and denationalization of state property and state enterprises in accordance

with the Law of the Republic of Tajikistan "On the privatization of state property in the Republic of Tajikistan";

– granting any rights to use subsoil in accordance with the laws of the Republic of Tajikistan "On subsoil" and "On concessions";

– implementation of credit projects (grant funds) allocated by international financial institutions and governments of foreign states, regulated by the rules of these organizations, the application of which is mandatory in accordance with and within the framework of the obligations assumed by Tajikistan and the requirements of these rules shall prevail.

1.4.2. Law of the Republic of Tajikistan " On drinking water supply and sanitation"

The Law of the Republic of Tajikistan "On drinking water supply and sanitation" establishes the legal, organizational, economic, social foundations for the provision of drinking water and sanitation, state guarantees for meeting the needs for drinking water, sanitation, as well as their quality and safety.

One of the principles of this law is the diversity of forms of ownership and management, including public-private partnership, demonopolization and decentralization of the management system.

According to this law, the regulation of the development of public-private partnerships in the field of drinking water supply and sanitation falls within the competence of the Government of the Republic of Tajikistan and the competence of local executive bodies of state power in terms of promoting the development of public-private partnerships and the private sector in accordance with the legislation of the Republic of Tajikistan in the field of drinking water supply and water supply.

This law provides that drinking water supply systems may be in state (republican and municipal) ownership, as well as in the ownership of individuals and legal entities.

Thus, individuals and legal entities have the right to manage non-centralized and autonomous systems of drinking water supply and sanitation in the absence of centralized systems, or they can delegate the right to manage other individuals and legal entities.

In general, the law provides for the transfer of ownership or change of ownership of public drinking water supply and sanitation systems only on the condition that the functioning of these systems will not be disturbed. In case of violation of the functioning of the transferred systems, the legislation provides for their withdrawal into state ownership and transfer to other organizations.

1.4.3. Law of the Republic of Tajikistan "On Water Users Association"

The Law of the Republic of Tajikistan "On Water Users Association" defines the economic, organizational and legal basis for the activities of the Water Users Association and is aimed at ensuring water saving and efficient use of hydraulic structures in the service area.

WUA is a non-profit and self-governing organization of water users, based on membership, created voluntarily in a certain territory, for the purpose of collective use and maintenance of the land reclamation system of the service area, provision of irrigation water, coordination of activities, representation and protection of their common interests.

The founders of the WUA are individuals and legal entities that consume water for irrigation of agricultural lands and satisfaction of industrial and household needs. WUA operates from the moment of its state registration in the manner prescribed by the Law of the Republic of Tajikistan "On State Registration of Legal Entities and Individual Entrepreneurs", as a legal entity. Therefore, according to the law on PPP, WUA falls under the definitions as "private sector".

This law determines the transfer to the management of the WUA of hydraulic structures that are state property and located in the service area of the association. The service area of a WUA is understood as a certain geographical area where the WUA provides water supply services.

The WUA does not have the right to sell or lease or sublease to other individuals and legal entities, as well as to individual entrepreneurs, hydraulic structures owned by the state and transferred to it for use. In case of liquidation of the Water Users Association, the mentioned facilities are returned to the owners according to their ownership.

WUA activities are coordinated by the authorized state body for coordinating WUA activities. According to the Decree of the Government of the Republic of Tajikistan dated April 29, 2020, No. 241 “On the definition of the authorized state body for coordinating the activities of a water users association”, the Agency for Land Reclamation and Irrigation under the Government of the Republic of Tajikistan (ALRI) is designated as the state authorized body for coordinating the activities of WUAs.

1.4.4. Water Code of the Republic of Tajikistan

The Water Code regulates social relations related to the ownership, use and disposal of water and water bodies and is aimed at the protection and rational use of water resources, as well as the legal protection of water users.

According to the Water Code, coordination of the actions of relevant ministries, departments, river basin councils, water user associations, private sector organizations, as well as non-governmental organizations in the field of use and protection of water resources is carried out by the National Water Council, which is a consultative and advisory body under the Government of the Republic of Tajikistan.

The Government of the Republic of Tajikistan may grant the right to manage state-owned water facilities within a limited area to individuals and legal entities on the basis of a public-private partnership, agreement, concession, lease or other forms of partnership, subject to compliance with the requirements of the legislation of the Republic of Tajikistan.

The term limited territory is defined as the territory on which on-farm water facilities are located. For example, the WUA service area falls under this term.

Water facilities that have a special strategic purpose are prohibited from leasing, concession, personal management or privatization of such water facilities.

The register of such structures in the field of melioration and irrigation is determined by the Decree of the Government of the Republic of Tajikistan "On approval of the state register of water facilities" dated May 28, 2009, No. 308.

This register includes the main hydraulic structures, including main canals and pumping stations of the ALRI system.

Below in tabular form are the main questions and answers on the introduction of PPP in the water sector in accordance with the current regulatory legal act.

Table 1. Basic concepts on the use of PPP in the water sector in accordance with the regulatory legal act

Questions	Answers	Link
What does the concept of PPP mean?	PPP is a form of cooperation between public and private partners in the implementation of projects in the field of infrastructure and social services for a certain period established by a public-private partnership agreement.	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
What does the authorized state body mean?	The State Committee for Investments and State Property Management of the Republic of Tajikistan is defined as the authorized body in the field of public-private partnership and ensures the implementation of the state policy on public-private partnership.	Decrees of the Government of the Republic of Tajikistan dated June 3, 2013, No. 250
What does the concept of "State Partner" mean?	Central (interested ministries and departments) or local government.	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
	The powers of local executive bodies of state power in the field of drinking water supply and sanitation also include promoting the development of public-private partnerships and the private sector in accordance with the legislation of the Republic of Tajikistan in the field of drinking water supply and sanitation	Article 7. Law of the Republic of Tajikistan "On drinking water supply and sanitation" dated July 19, 2019, No. 1633
What does the concept of "Private Sector" mean?	An individual entrepreneur or a legal entity whose founder is an individual or non-state legal entity	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
What does the concept of " Private Partner " mean?	An individual entrepreneur or a private sector legal entity implementing an infrastructure or social services project in accordance with a public-private partnership agreement.	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
What does the concept of " Organization-customer " mean?	Central or local government body with the authority to enter into agreements with a private partner under the PPP legislation.	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907

What projects are envisaged in PPP	Investment projects related to infrastructure and projects for the provision of services in the social sphere.	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
Can PPP be used in water infrastructure	The concept of "Infrastructure" in the legislation on PPP defines a set of structures, buildings, systems and structures necessary for the functioning of the branches of material production, the creation or improvement of the living conditions of society, including in the water system.	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
Can PPP be used in water service projects	Service delivery projects include: design, development and operation of any structures that directly or indirectly provide social services to the public for a period of at least three years, which were under the jurisdiction of the contracting authority prior to the start of the project.	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
Can water facilities and drinking water supply facilities be privatized	– Privatization of facilities that ensure the vital activity of the economy of cities and regions, objects of the fuel and energy complex, water facilities, (with the exception of the drinking water supply system), etc., are carried out by decision of the Government of the Republic of Tajikistan; – Water facilities transferred in accordance with the Law on PPP to PPP cannot be privatized during the period of validity of the public-private partnership agreement (LoRT dated 23.07.16, No. 1352); – Buildings and structures of state bodies, drinking water supply systems, which are the exclusive property of the state, are not subject to privatization.	Article 9
	Water management facilities that have a special strategic purpose are not allowed to lease, concession or personal management, as well as the privatization of water facilities that have a special strategic purpose is prohibited. The list of water facilities with a special strategic purpose is determined by the Government of the Republic of Tajikistan.	Article 10. Water Code of the Republic of Tajikistan dated April 2, 2020, No. 1688

Who prepares the partnership project	An infrastructure or social service project between a contracting authority and the private sector is prepared by the contracting authority.	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
Who prepares the feasibility study of the project and the draft PPP agreement	The feasibility study of the project and the draft agreement are prepared by the customer organization	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
Who reviews the feasibility study of the PPP project and the draft agreement	Feasibility study of the project and agreement is considered by the PPP Council	Article 5., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
What are the tasks of the PPP Council	Submission for consideration by the Government of the Republic of Tajikistan of a list of infrastructure facilities and social services in respect of which the PPP Law does not apply. Consideration and approval of project proposals and draft agreements submitted by the customer organization in accordance with the recommendations of the authorized state body.	Article 2., Law of the Republic of Tajikistan "On public-private partnership" dated December 28, 2012, No. 907
Is it possible to grant the right to manage state-owned water management facilities to individuals and legal entities in the field of melioration and irrigation?	The Government of the Republic of Tajikistan may grant the right to manage state-owned water facilities within a limited area to individuals and legal entities on the basis of a public-private partnership, agreement, concession, lease or other forms of partnership, subject to compliance with the requirements of the legislation of the Republic of Tajikistan.	Article 26. Water Code of the Republic of Tajikistan dated April 2, 2020, No. 1688
What does the concept of " limited territory" mean?	The limited territory is the territory on which on-farm water facilities are located.	Article 1. Water Code of the Republic of Tajikistan dated April 2, 2020, No. 1688
Is it possible to provide the right to manage drinking water supply and sanitation systems of state property to individuals and legal entities	One of the main principles of drinking water supply and sanitation is a variety of forms of ownership and management, including public-private partnership.	Article 4. Law of the Republic of Tajikistan "On drinking water supply and sanitation" dated July 19, 2019, No. 1633

	– Drinking water supply systems may be in state (republican and communal) ownership, as well as in the ownership of individuals and legal entities. – The transfer of ownership or change in the form of ownership, the granting of the right to use in any form not prohibited by the legislation of the Republic of Tajikistan for a certain period or indefinitely state drinking water supply and sanitation systems are allowed provided that the functioning of these systems is not disrupted. – The owners of drinking water supply and sanitation systems may grant the right to use them in any form not prohibited by the legislation of the Republic of Tajikistan to individuals and legal entities, local executive bodies of state power and self-government bodies of settlements and villages, as well as water user organizations serving these systems. – In case of malfunction and non-compliance with the technical conditions for the provision of drinking water and sanitation, which pose a threat to public health, non-state centralized, non-centralized and autonomous drinking water supply and sanitation systems in the manner prescribed by the legislation of the Republic of Tajikistan may be seized into state ownership and transferred to other organizations in the manner determined by the legislation of the Republic of Tajikistan, for the organization of better operation.	Article 9. Law of the Republic of Tajikistan "On drinking water supply and sanitation" dated July 19, 2019, No. 1633

1.4.5. State and industry programs for the participation of the private sector in the financing of the water sector

1.4.5.1. National Development Strategy of the Republic of Tajikistan for the period up to 2030

The National Development Strategy of the Republic of Tajikistan for the period up to 2030 (hereinafter - NDS-2030) adopted by the decision of the Majlisi Namoyandagoni Majlisi Oli of the Republic of Tajikistan of December 1, 2006 No. 636 was developed on the basis of the provisions of the Constitution of the Republic of Tajikistan, the Law of the Republic of Tajikistan "On State Forecasts, Concepts, Strategies and Programs for the Social and Economic Development of the Republic of Tajikistan" and in accordance with the long-term goals and priorities of the country's development .

NDS-2030 provides for improving the investment climate in Tajikistan through the development of PPP, in particular:

– development of a PPP development program that provides for a clear formation of goals, objectives and priority areas for its development;

– improvement of the regulatory legal framework in the field of PPP and integration of the Law "On Concessions" into the Law "On PPP";

– strengthening funding through the state institution "Entrepreneurship Support Fund", including support for women's entrepreneurship and strengthening the capacity of the authorized body to attract investments, improving the efficiency of the PPP Council and the PPP Project Implementation Center;

– development of forms and procedures for accounting for PPP projects, as well as indicators for monitoring projects implemented under public-private partnership schemes;

– creation of incentives for the initiation and implementation of projects through PPP by representatives of local executive bodies of state power;

– creation of a development fund (preparation and support) of PPP projects, including at the expense of extra-budgetary sources not prohibited by law;

– introduction of an economically justified system for setting tariffs for transport and other infrastructure services built according to PPP schemes

1.4.5.2. Medium-term development program of the Republic of Tajikistan for 2021-2025

The medium-term development program of the Republic of Tajikistan for 2021-2025 was adopted by the Decree of the Government of the Republic of Tajikistan dated April 30, 2021, No. 168.

The Medium-Term Development Program of the Republic of Tajikistan for 2021-2025 (hereinafter referred to as MDP 2021-2025) has been developed to ensure the implementation of the second stage of the NDS-2030.

For the development of PPP in the water sector, the program provides for:

– developing a road map to support NGOs and non-governmental organizations in the provision of water supply and sanitation services, involving the private sector in the management and operation of drinking water supply systems and facilities through PPPs, especially in rural areas, and introducing the practice of contracting services and management;

– transfer of water facilities, state-owned drinking water supply networks to individuals and legal entities on the basis of PPP, agreement, concession, lease or other forms of partnership;

1.4.5.3. Tajikistan Water Sector Reform Program for 2016-2025

The water sector reform program of Tajikistan for the period 2016-2025 was adopted by the Decree of the Government of the Republic of Tajikistan dated December 30, 2105, No. 791.

The program notes that the future water management system in the Republic of Tajikistan will be based on the active participation of organizations, water users and the private sector in the formation of policies, strategies, development and implementation of programs, as well as the decision-making process. The participation of the private sector in the development of the water sector, carried out in accordance with the legislation of the Republic of Tajikistan on PPP, plays an important role in its economic and financial sustainability.

The active participation of the civil society, as representatives of the public, in the formation of production policy and legislation, as well as the contribution of water users in the regulation, rational and sustainable use of water resources, the maintenance of water infrastructure, planning and meeting people's needs for water resources in accordance with established standards, is of great importance. Therefore, there is a great need for the creation and development of water user organizations (WUAs) with state and non-state support.

Annex 1. Provides a plan for the implementation of the reform program with investment projects.

1.4.5.4. The concept of the reform of the housing and communal services of the Republic of Tajikistan for the period 2010-2025.

In 2010, by the Decree of the Government of the Republic of Tajikistan dated July 1, 2010, No. 321, the Concept for the Reform of the Housing and Communal Services of the Republic of Tajikistan for the period 2010-2025 was adopted.

One of the objectives of the reform is the de-monopolization of the industry, the creation of conditions for the development of market relations, the transition to the formation of contractual relations, the development of a competitive environment in the public utilities market.

To solve the problems of the reform, it is proposed to attract on an equal basis organizations of various forms of ownership to provide housing and communal services. The implementation of a predominantly competitive selection, including private organizations that manage the housing stock and its maintenance, provide utilities with materials, equipment and perform design and construction work.

1.4.5.5. Program for the development of housing and communal services for the period 2021-2024

The program for the development of housing and communal services for the period 2021-2024, approved by the Decree of the Government of the Republic of Tajikistan dated February 27, 2021, No. 53, provides for the creation of conditions for attracting private sector funds on a short-term and long-term basis.

Especially the water supply and sanitation industry needs to attract PPP funds for the construction of infrastructure in rural areas to provide clean drinking water to the population. Since the population in rural areas use water from open sources, which can cause the spread of various diseases, including infectious ones.

1.4.5.6. Programs for socio-economic development of districts and cities

Local government bodies of districts and cities, on the basis of NDS-2030 and MDP 2021-2025, develop 5-year Socio-Economic Development Plans. These plans analyze the various sectors at the district and city levels, and based on the findings, five-year investment projects are prepared.

PPP and attracting funds from private partners plays one of the most important tasks for the implementation of these plans, which contributes to the socio-economic development of regions and cities.

Projects are also being prepared for PPPs and private partners in the water sector. Here, the Local Authorities of the districts and cities act as the “Public Partner” when signing the PPP Agreement with private partners.

1.4.5.7. Public Investment Program for 2021-2025

The public investment program for 2021-2025 was adopted by the Decree of the Government of the Republic of Tajikistan dated September 2, 2021, No. 358.

The Public Investment Program for 2021-2025 (hereinafter referred to as the PIP) has been developed with the aim of attracting domestic and foreign investment and developing new investment projects for the development of the national economy.

The PIP takes into account the goals of the Government of the Republic of Tajikistan regarding the improvement of favorable conditions for investment activities and the private sector. Increasing the participation of the private sector in sectors of the national economy contributes to the generation of income, the reduction of poverty and the improvement of the well-being of the population of the country.

PIP 2021-2025 includes 898 projects totaling $19.1 billion, including 62 new projects worth $540.6 million. From the "Public Investment Program for 2016-2020" 836 projects were transferred to the new Program for a total of 18.6 billion US dollars.

Out of 898 projects, including 64 projects in the energy sector (7,824 million USD or 41%), 103 projects in the transport sector (4507 million USD or 24%), 135 projects in the agricultural sector and irrigation/melioration (2 $481 million or 13%), 272 projects in the water supply and sanitation sector ($1222 million or 6%), 121 projects in other sectors ($1394 million or 7%), 92 projects in the education and science sector (821.4 million dollars or 4%), 88 projects for health and social protection of the population (589.9 million dollars or 3%), 15 projects for the economic

management sector (245.5 million dollars or 1%) and 7 projects are in the trade and sector services ($23.6 million or 0.1%).

Sources of funding for public investment are donor funds, the state budget and other internal and external sources of funding.

In general, about 15% of PIP investment funds are allocated to the infrastructure sectors of the water sector. Well-maintained water sector infrastructure will directly and indirectly support economic growth in all other sectors, so the private sector is expected to be active here.

1.4.6. The procedure for the preparation and implementation of investment projects for PPP

According to the above regulatory legal act, PPP projects are prepared as follows:

- **Step 1.** The state partner further the contracting authority (interested line ministries and departments) or local government authority prepares a partner project including a feasibility study for the project.
- **Step 2.** Submits for approval to the authorized state body to the State Committee for Investments and State Property Management and the State Institution "Center for the Implementation of Public-Private Partnership Projects" created on its basis.
- **Step 3.** Upon completion of the feasibility study and consultations with the authorized state body for the feasibility study, the contracting authority submits a project proposal, including a completed feasibility study, for consideration and approval by the PPP Council.
- **Step 4.** After obtaining approval from the PPP Council, the contracting authority submits the request for expression of interest and the relevant attached pre-selection tender documents to the authorized state body in order to obtain written consent for the announcement, invitation, signing or request for tender proposals for the tender, start of pre-selection procedures. The Request for Expression of Interest includes the following information:
  - description of the partnership project;
  - indication of the mandatory elements of the partnership project;
  - services provided by a private partner;
  - financial measures envisaged by the customer organization;
  - a brief description of the main mandatory terms of the Agreement;
  - the method and place of submission of applications for pre-selection and the deadlines for submission, the date and time giving tenderers time to prepare and submit a request for expression of interest;
  - method and place for collection of pre-qualification tender documents;
  - a corresponding request that the contracting authority has the right to request proposals after the completion of the pre-selection procedures only from a limited number; tenderers that best meet the pre-selection criteria.
- **Step 5** The contracting authority evaluates the qualifications of each bidder that has expressed interest in pre-selection, applying the criteria established by the pre-selection tender documents and submits it to the authorized state body for consideration.
- **Step 6** After approval by the authorized state body of the pre-selection report, the contracting authority prepares a request for proposals and submits it to the authorized state body.

The authorized state body reviews the request for proposals and submits it for consideration by the PPP Council. Once the Council agrees to issue a Request for Proposals, the contracting authority shall submit the Request for Proposal to each pre-selected Bidder, who shall pay the cost. Request for proposals with technical and financial proposals attached shall be submitted as a separate document. The content of the request for proposals includes a list of tender documents and a draft of the proposed Agreements for the relevant partnership project.

- **Step 7.** The contracting authority creates an evaluation committee to evaluate proposals. The composition of the evaluation commission should include a representative of the authorized state body. Evaluation of proposals is indicated in the request for proposals and is carried out in accordance with the evaluation criteria, the weight, the bid review process intended for such a criterion, and their significance.
- **Step 8.** After the approval of the assessment report by the Council, the contracting authority, after obtaining the consent of the authorized state body, submits the proposed agreements through the authorized state body for consideration by the Council. The Council approves or returns for revision the proposed draft agreements. The contracting authority shall not proceed with any proposed partnership project without the prior consent of the Board.
- **Step 9.** The contracting authority issues a contract award notice, which will be published accordingly.
- **Step 10.** Signing the agreement and starting the project.

The PPP Law provides for, after the consent of the PPP Council, negotiations on the Agreement by the contracting authority without using the above tender procedures, in the following cases:

– if there is an urgent need for the continuous provision of services and provided that the circumstances that caused this urgent need could not be foreseen by the contracting authority, and these circumstances are not the result of the slowness of the contracting organization;

– when the partnership project is of short duration and when the expected initial investment amount does not exceed the amount indicated by the Board;

– when the partnership project affects issues of national defense or public safety;

– if there is only one source capable of providing the required service, including the use of intellectual property, trade secrets or other exclusive rights that are owned or controlled by a certain person (s);

– when pre-qualification tender documents or a request for proposals have been issued but no responses have been received, or when all proposals have failed to meet the evaluation criteria specified in the request for proposals, and if, in the opinion of the contracting authority, the issuance of new preliminary tender documents selection and a new request for proposals will not result in a contract being awarded within the required time frame;

– in other cases, when the Council approves such an exception for compelling reasons of national or public interest, or in cases of recognition in the interests of a local government authority.

If agreements are negotiated without a tender, the contracting authority:

– conducts a preliminary feasibility study and finalizes it in accordance with the recommendations of the Council;

– if possible, starts negotiations with persons whom the contracting authority considers capable of implementing the partnership project with the participation of a representative of the authorized state body;

– establishes the evaluation criteria according to which proposals will be evaluated and ranked.

It should be noted that the private sector is especially interested in the return on investment and actually expected profit, i.e. balance of costs and benefits from participation in the implementation of a particular project. Therefore, the contracting authority must provide for all financial aspects of the proposed project in order to show it is financially attractive to the private partner.

In addition, a particularly important aspect is the division of responsibility and authority between PPP participants. Below is an analysis of the interests of the private partners.

Table 2. Analysis of possible interests of private partners

No.	Possible interests of the private partners	According to the regulatory legal act of PPP	Possible criteria for the benefit of the parties
1.	The right to use and manage existing water infrastructure	A private partner may be granted the right to manage state-owned water facilities within a limited area to individuals and legal entities on the basis of a public-private partnership, agreement, concession, lease or other forms of partnership, except for water facilities that have a special strategic purpose.	– Determining the benefits of the parties on the investments made during the preparation of the feasibility study and the agreement; – Return on investment by a private partner; – Preservation of functioning of water infrastructure at the end of the term of the agreement;
2.	Construction, ownership and management of water infrastructure	The right of ownership and management is transferred to the private partner for a certain period specified in the agreement without granting the right of ownership.	– Determining the benefits of the parties on the investments made during the preparation of the feasibility study and the agreement; – Return on investment by a private partner; – Preservation of functioning of water infrastructure at the end of the term of the agreement;
3.	Construction, operation, management and transmission of water infrastructure	The right of ownership and management is transferred to the private partner for a certain period specified in the agreement.	– Determining the benefits of the parties on the investments made during the preparation of the feasibility study and the agreement; – Return on investment by a private partner; – Preservation of functioning of water infrastructure at the end of the term of the agreement;
4.	Design, construction and commissioning of water management facilities to the state	Transfer of the facility to the state by the PPP immediately after construction, subject to reimbursement of costs by regular payments, where the private partner maintains the facility during the period specified in the agreement.	– Determining the benefits of the parties on the investments made during the preparation of the feasibility study and the agreement; – Return on investment by a private partner; – Preservation of functioning of water infrastructure at the end of the term of the agreement;
5.	Concession	The right to finance the construction, operation, maintenance, management and the right to return the investment within the terms specified in the agreement is transferred to the PPP.	– Determining the benefits of the parties on the investments made during the preparation of the feasibility study and the agreement; – Return on investment by a private partner.

2. Overview of Water Sector Financing

2.1. Review of annual budget allocations for financing the water sector

In the water sector reform program for the period 2016-2025. it is defined that the water sphere is as a “sector”, and various types of special water use are sub-sectors. For example, drinking water supply and sanitation, hydropower, irrigated agriculture, industry, fisheries, recreation, etc.

In the Republic of Tajikistan, state regulation in the field of use and protection of water resources is carried out by the following bodies:

- Government of the Republic of Tajikistan;
- the authorized state body in the field of regulation of the use of water resources;
- authorized state body in the field of environmental protection;
- the authorized state body in the field of drinking water supply and sanitation;
- authorized state body in the field of land reclamation and irrigation;
- the authorized state body in the field of supervision over the safe conduct of work in industry and in the field of mining supervision;
- the authorized state body in the field of subsoil use;
- local executive bodies of state power;
- other state bodies within their powers in accordance with the legislation of the Republic of Tajikistan.

The water sector reform program defines the following government bodies in terms of water resources management:

- Ministry of Energy and Water Resources;
- Ministry of Agriculture;
- Ministry of Health and Social Protection of the Population;
- Committee for Environmental Protection;
- Committee for Emergency Situations and Civil Defense;
- Main Department of Geology;
- State Supervision Service for Safe Work in Industry and Mining Supervision;
- Agency for Land Reclamation and Irrigation;
- State Unitary Enterprise " Khojagii Manziliyu Komunali";
- Open Joint Stock Holding Company “Barki Tojik ”.

The activities of all these state bodies, except for the OAHK "Barki Tojik ", are financed from the state budget.

However, it should be noted that all of the above state bodies, except for the Agency for Land Reclamation and Irrigation, have other tasks besides managing water resources. Therefore, below is information on budgetary financing relating specifically to the areas of management, regulation, use and protection of water resources.

Table 3. Financing ministries and departments for the management, regulation, use and protection of water resources from the state budget

No.	Name of state bodies	Budget financing, thousand somoni				
		2017	2018	2019	2020	2021
1.	Ministry of Energy and Water Resources	2883.7	3034.0	3549.0	4184.0	5716.7
2.	Ministry of Agriculture:	-	202.0	337.0	758.0	300.0
3.	Main Department of Geology	97000.0 (from 2011 to 2020)				600.0
4.	Agency for Land Reclamation and Irrigation	71633.8	80676.6	87582.4	95689.1	102572.1
5.	State Unitary Enterprise "KMK»	1397.0	1403.5	1587.5	1705.2	1316.2

As can be seen from the table, annually, taking into account inflation and wage increases from the state budget, budget allocations to the water sector tend to increase.

As for the Ministry of Energy and Water Resources, funding for the newly established Basin Organizations of the Syrdarya, Zarafshan, Kafernigan , Vakhsh and Pyanj rivers as part of the water sector reform began in 2020, so the table shows an upward trend in the budget relative to 2017.

2.2. Financing through water services

The main subsectors of water users in the country are drinking water supply and sanitation, hydropower, irrigated agriculture, industry, fisheries, recreation and the environment. Tajikistan actually uses only 17-20% of the water resources formed on its territory. On average, over the period of observations, the annual volume of water resources used by various sectors of the country's economy ranged from 8.0 to 14.5 km3/year. Including : _

– In the drinking water supply and sewerage subsector, in the order of 400 million m^3/year, from ground and surface waters;

– In the hydropower industry, about 30-35 km^3 of water annually passes through the country's hydroelectric power stations and generates a total of 16-17 billion kWh. hours of electricity, from surface water;

– In irrigated agriculture, the total volume of water intake is on average 8.0-10.0 km^3/year, from surface and groundwater;

– In the industry during the Soviet period, it was used in the order of 607 million m^3/year, in this period it decreased to 240-300 million m^3/year.

– In fisheries, fish ponds use in the order of 90-100 million m^3/year;

– In recreation, the volume of water used in the recreational areas of the country is not defined, but it is known that the water used in this case, after purification, is partially returned to the sources;

– In order to protect the environment in Tajikistan, forests, lakes and wetlands are water users. The volume of water use at this stage is not defined.

The fee collection for water supply and sanitation services is carried out mainly by two sub-sectors, they are the drinking water supply and sanitation sub-sector, and the land reclamation and irrigation sub-sector.

2.2.1. Drinking water supply and sanitation subsector

According to the Decree of the Government of the Republic of Tajikistan of October 27, 2020, No. 550 "On the determination of the authorized state body in the field of drinking water supply and sanitation", the authorized state body in this area that conducts state policy in this area is the State Unitary Enterprise "Khojagii manziliyu komunali" (SUE " KMK " - State Unitary Enterprise Housing and Communal Services).

State Unitary Enterprise "KMK" serves more than 2 million people in 15 cities, 24 districts and 40 district centers, in which there are its structural subdivisions.

The rest of the cities are provided with water supply and sanitation by local authorities through, for example, State Unitary Enterprise "Dushanbevodokanal", State Unitary Enterprise "Khujandvodokanal", State Unitary Enterprise of water utilities of the cities of Rogun, Nurek and Sarband, numbering more than 1.5 million people.

The infrastructure for water supply and sanitation was mainly built in the 50-60s of the last century, which several times exceeded its service life. This infrastructure, being state property, is managed and maintained on a self-supporting basis. This system is a capital-intensive production, since water companies bring their products directly to consumers and perform all the functions of processing and disinfection, transportation and distribution (water pipelines, mains and water distribution networks).

The length of water supply and distribution networks (of different diameters) in all centralized urban water supply systems in Tajikistanis is 3.0 thousand km. According to pipe materials: cast-iron pipelines - 500 km, asbestos-cement pipes - 450 km, the remaining 2050 km are steel pipes. 95% of water supply networks were laid before 1980, the period of operation of which already exceeds 30 years. The operation and regulation of water supply networks is carried out with the help of 25,000 valves installed in more than 15,000 wells. To regulate uniform water consumption, clean water tanks with a total volume of 300 thousand cubic meters (115 units) are used, the number of pumping stations is 150, of which 95 are pumping stations for high-rise buildings.

The previously built and commissioned water supply networks have become unusable due to long-term operation. The physical deterioration of networks is 60-70%.

The amortization of the water supply infrastructure of SUE "KMK" is 32%, including 7% are partially operational and 25% are in need of full restoration. At the district level, these figures are 40.44 and 16% respectively. In general, at the level of districts and cities on the balance sheet of subordinate SUE "KMK", out of 84 units. pumping stations 54 units, out of 406 units. pumping units 108 units, out of 551 units. wells 145 units, out of 193 units. tanks with different volumes 172 units. out of 5978.3 km of water supply networks, including 3236 km of main water supply networks are in need of modernization and restoration work.

Regarding the sewerage infrastructure of SUE “KMK”, out of 65 cities and districts that are served by subordinate organizations of SUE “KMK”, only 34 districts and cities have wastewater systems. Of the 34 sewerage systems with a design capacity of 720,000 m3/day, only 3 systems are fully operational. The rest require urgent measures to modernize and restore these systems. In total, there are 820.6 km of collectors and sewer pipelines, which are also in need of modernization and restoration work.

According to the State Unitary Enterprise “KMK”, currently only 67.1% of the population of Tajikistan have access to drinking water and good sanitation.

It will take 30-40 years to fully provide the country's population with clean drinking water. For these purposes, $2 billion is needed, of which about $1.7 billion will be required for the construction and reconstruction of infrastructure, water supply and sanitation (sewage).

At the moment, the current tariffs for drinking water and sanitation from 2018 were calculated on the basis of the “Regulation on the calculated cost of products (works, services) at enterprises and organizations of the Republic of Tajikistan”, which was approved by the Decree of the Government of the Republic of Tajikistan dated May 12, 1999, No. 210.

Based on this, the last increase in the tariff was carried out by the Order of the Antimonopoly Service under the Government of the Republic of Tajikistan dated August 27, 2018, No. 90. Below are the tariffs for water supply and sanitation, pasture watering and irrigation for 2017 and 2018 from the systems of SUE "KMK".

Table 4. Tariffs for water supply and sewerage, pasture watering and irrigation for 2017 and 2018

No.	**Services list**	**From 1.09.2017, on average in** somoni	**From 1.10.2018 on average in** somoni
	To provide the population with drinking water per 1 m^3		
	For the population	0.91	1.09
	For budget organizations	1.69	2.02
	For economic, commercial and other enterprises	2.90	3.48
	For water disposal (sewerage) per 1m^3		
	For the population	0.46	0.55
	For budget organizations	0.91	1.09
	For economic, commercial and other enterprises	1.57	1.88
	For watering pastures per 1m^3		
	Irrigation of pastures	0.77	0.09
	For irrigation per 1m^3		
	for irrigation	0.05	0.06

At this stage, the existing tariffs for drinking water and sanitation in Tajikistan do not fully reflect the cost of services and do not cover all costs for the operation and maintenance of infrastructure.

For example, the cost of services to provide the population with clean drinking water is at least 4 somoni per 1 m^3 of water.

In addition, due to inadequate services, fees for water supply and sanitation services are low . For example, the collection for water supply services to the population is at the level of 60-70%, from commercial consumers 70-80%. The collection rate among the budget organization is approximately at the level of 40-50%

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In this regard, further tariff calculations must be carried out on the basis of the Decree of the Government of the Republic of Tajikistan dated June 23, 2020 No. 364 “On the Procedure for the Development of Tariffs for Drinking Water Supply and Sanitation Services”.

State Unitary Enterprise "KMK" should also provide heat supply. The boiler houses of this enterprise were also built in the 60-80s of the last century. As of January 1, 2019, there were 1,171 boiler houses in the country for supplying water for heat supply. Of this amount, 409 units. are in working condition, 633 are not working and 129 are beyond repair. At the moment, heat supply is carried out only in Dushanbe, where about 60% of multi-storey buildings are covered by centralized heat supply.

In addition, SUE "KMK" is responsible for the sanitary condition of districts and cities. According to preliminary data of SUE "KMK", more than 2.5 million m^3 of various municipal solid waste is generated in the regions and cities. There are 73 units landfills for disinfection and disposal of these wastes in the country.

In general, for all services of SUE “KMK”, we see progress in terms of increasing services from 99.4 million somoni per year to 148.0 million somoni per year in 2018. For all activities, as of January 1, 2019, SUE “KMK” has receivables of 81.39 million somoni. Accounts payable is 85.39 million somoni.

2.2.2. Land reclamation and irrigation subsector

The land reclamation and irrigation sector is one of the real sectors of the economy that contributes to the achievement of the strategic goals of the National Development Strategy of the Republic of Tajikistan for the period up to 2030, including ensuring food security, employment in agriculture and thereby improving the living standards of the population.

From the period of gaining independence by the Republic of Tajikistan until November 19, 2013, the functions related to land reclamation and irrigation were assigned to the former Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan and further to the Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan.

In 2013, by the Decree of the President of the Republic of Tajikistan “On improving the structure of the executive bodies of state power of the Republic of Tajikistan” dated November 19, 2013, No. 12, the Agency for Melioration and Irrigation was established under the Government of the Republic of Tajikistan.

The Agency is the central executive body of state power in the field of land reclamation and irrigation, which performs the functions of developing a unified state policy and legal regulation in the field of land reclamation and irrigation systems, the use and conservation of water facilities, the provision of irrigation water and the protection of water resources.

In general, there are 762,000 hectares of irrigated land in the republic. Of these, the Agency's melioration and irrigation system serves 550,000 hectares of irrigated land. At this stage, not all of these irrigated lands are covered by the WUA zone. The number of WUAs in the country

is 347 units. which serve irrigated lands on an area of 372,548.2 ha. As part of the land reform in the country, the number of water users has increased from 52,708 in 2010 to over 210,000 in 2020.

To service irrigated lands in the country, 26.7 thousand kilometers of irrigation networks, main canals and 11.4 thousand kilometers of collector and drainage networks, 7099 hydraulic structures, 390 pumping stations (the total length of pressure pipelines is 624.67 km), from 1500 units, 505 vertical wells, 169 siphons, 110 aqueducts, 5455 water distribution points, 3858 gauging stations. Also on the balance of AMI there are 4 reservoirs for irrigation purposes and 1386 km of bank protection dams.

For the development of the foothills, large cascade pumping stations have been built, reaching 2-7 lifts, in general, there are 228 cascade pumping stations in the country with 922 units that irrigate 213.2 thousand hectares.

However, the irrigation and drainage system of irrigated lands, which was built mainly in 1930-1980. of the last century is a complex infrastructure in terms of technical equipment and maintenance technology, in addition, this infrastructure has a high wear and tear depending on the long period of operation and is characterized by a high energy intensity of pumping stations.

For the sustainable maintenance and operation of the irrigation and drainage system, the annual need for financing this sector from all sources is more than 400 million somoni. However, the budget financing and the tariff for water supply services do not cover the costs associated with the operation and maintenance of the irrigation and drainage infrastructure.

The tariff for water supply services is regulated by the Antimonopoly Service under the Government of the Republic of Tajikistan. At the moment, on the basis of the order of the Antimonopoly Service under the Government of the Republic of Tajikistan dated May 30, 2018, No. 62, “On amendments to the order of the Antimonopoly Service under the Government of the Republic of Tajikistan dated April 23, 2018, No. 50 “On approval of tariffs for water supply and irrigation from irrigation systems" the price for the services of supplying 1 m^3 of water is set at 2.0 diram, including value added tax (VAT).

For those areas where water meters are not installed and there is no possibility of installing water meters, a volumetric method of calculating irrigation water per 1 ha based on the water consumption norms of various crops is used to account for water and irrigation water consumption by agricultural crops.

Every year, at the beginning of the year, the Land reclamation and irrigation department at the level of districts and cities, as well as the established Basin Organizations for Land Reclamation and Irrigation in the Zarafshan River Basin and in the lower Kafernigan conclude agreements for water supply services with water user associations (WUAs) and where no WUAs have been established, conclude agreements directly with dekhkan farms (farm) and other water consumers for the growing season.

The Agency’s budget is mainly formed from the republican budget and from the water supply service. In 2021, the collection of funds for water supply services amounted to 64.45 million somoni, at the level of 80.8% of the total cost of water supply services. Financing from the republican budget amounted to 100.22 million somoni. Thus, the total actual budget for 2021 amounted to 164.67 million somoni.

For 2021, the Agency's receivables amounted to 198.94 million somoni, and accounts payable amounted to 487.70 million somoni. The main financial indicators of the Agency for 2021 and the 1st quarter of 2022 are given in tabular form below.

Table 5. The total budget of the Agency for 2021 and the 1st quarter of 2022

	ALRI's total budget for 2021 and Q1 2022	**thousand somoni**	**thousand somoni**
No.	**Names**	2021	1 quarter 2022
1	**Total volume of water supply, million m3**	**4188.1**	**9.8**
2	**Total cost of water supply services**	**79771.3**	**213.8**
3	**Total collection of water supply fee**	**64455.4**	**11638.4**
4	**Funding from the state budget**	**100227.8**	**16671.9**
	Including:		
	Salary	27897.1	7194.4
	Social tax 25%	6978.9	1798.6
	Subsidies for electricity bills	40238.2	7503.7
	Fuel and lubricants	342.7	46.9
	Maintenance	325.5	21.0
	Purchase of equipment	350.0	16.0
	Other expenditure	379.7	20.1
	Capital construction	16000.0	0
	Tajikistan's contribution to ALRI investment projects	7715.7	71.2
5	**Accounts receivable**	**198940.0**	**188555.8**
6	**Accounts payable**	**487058.7**	**450308.0**
	Including:		
	Wage arrears	772.7	933.8
	Electricity debt	365964.6	363000.0
	Social tax debt 25%	25837.5	25907.8
	Debts on other types of taxes	11833.0	10983.4
	Other debts	82650.9	49483.0

Accounts payable are mainly formed due to non-payment of funds for electricity consumption. Since the preferential tariff for electricity in the melioration and irrigation sector is several times higher than the cost of pumped water by pumping stations.

Below, are presented data on water supply services and electricity consumption for 2021 and Q1 2022.

Table 6. Information on water supply services and collection of irrigation service fee in the ALRI's system

Years	Total debt for water supply services, cumulative basis, thousand somoni	Water supply, mln. m3	Cost of water supply service, thousand somoni	Collection of water supply service fee, thousand somoni	Total funds used for water supply services, thousand somoni	Debt for water supply services, at the end of the year, thousand somoni
2020	129426.1	4109.9	78106.8	63008	63008	144524.9
2021	144524.9	4188.1	79771.3	64455.4	64455.4	159840.8
Q1 2022	159840.8	9.8	213.8	11638.4	11638.4	148416.2

Table 7. Information on the use and payment of electricity in the ALRI system

Years	Total debt for electricity, thousand somoni	Used electricity thousand kWh	Cost of used electricity thousand somoni	Payment for used electricity, thousand somoni	Electricity debt at the end of the year, thousand somoni
2020	209928.4	1393494.4	117826.2	39443.5	288311.1
2021	288311.1	1392075.5	115879.7	39889.5	364301.3
Q1 2022	364301.3	23683.5	4633.2	7502.4	361432.1

2.3. Financing through international investment

The Government of the Republic of Tajikistan makes every effort to support these industries, therefore it attracts international grants and loans from international financial institutions and international organizations for the implementation of investment projects.

In 2021, 23 projects were implemented in the water sector of the Republic of Tajikistan for a total of $373.53 million, including through loans in the amount of $107.55 million (28.80%), grants - 256, 87 million US dollars (68.77%) and the contribution of the Government of the Republic of Tajikistan in the amount of 9.11 million US dollars (2.43%).

Among all investments, 57.0% of financial resources were directed to the implementation of projects in the field of drinking water supply and sanitation, 31.86% to the implementation of projects in the field of melioration and irrigation, and 11.14% of financial resources to the implementation of projects in the field of water policy, improving the institutional structure management of water resources, water legislation, etc., not included in the Program of state investment projects.

In the field of drinking water supply, 8 projects are being implemented for a total of 212.93 million US dollars, including through loans in the amount of 28.5 million US dollars (13.38%), grants - 182.42 (85, 67%) million US dollars and the contribution of the Government of the Republic of Tajikistan in the amount of 2.01 million US dollars (0.95%).

In the field of melioration and irrigation, 4 projects are being implemented for a total of 119.0 million US dollars, including through loans in the amount of 79.05 million US dollars (66.43%), grants - 32.85 million. USD (27.6%) and the contribution of the Government of the Republic of Tajikistan in the amount of USD 7.1 million (5.97%).

In the field of water policy, improvement of the institutional structure of water management, water legislation, etc., not included in the Program of State Investment Projects, 11 projects are being implemented for a total of 41.6 million US dollars (100% grant).

2.4. Financing the water sector from the private sector

Financing from the private sector to the water sector is carried out on a planned and voluntary basis through PPP mechanisms, through support for WUA activities from development partners, and through local community contributions to water infrastructure.

The planned financing of the water sector by PPP is carried out on the basis of programs for the socio-economic development of regions, cities, districts, which are approved by resolutions of local government bodies, PIP 2021-2025, etc. based on PPP projects prepared by the customer organization.

The contribution of the private sector through the WUA support mechanism is carried out at the field level through partial co-financing of the rehabilitation of on-farm irrigation and drainage systems based on the water sector reform implementation plan.

The contribution of local communities is carried out in the form of maintenance and operation of water facilities, which are on the balance sheet of local communities in mountainous areas.

Voluntary donations from the private sector are also made during accidents of small hydraulic structures, or destruction of structures by mudflows and floods. Such funds are not fixed and it is difficult to determine the amount of voluntary funding.

In general, for 2017-2021, according to the data of local government bodies, financing of all forms of the private sector in the form of various contributions to the water sector amounted to 362.8 million somoni. Including for drinking water supply - 104.5 million somoni and for land reclamation and irrigation - 258.3 million somoni.

As for PPP projects, PPP projects are currently being successfully implemented in the social, energy and transport sectors. For example:

– Pamir Energy (the first PPP project in the energy sector of Tajikistan, one of the top 10 UNECE projects);

– Dushanbe - Chanak Toll Road Project (25 years of concession for the operation and management of the road connecting the Center and the Northern part of Tajikistan);

– Project for the construction of a HPP on the Vakhsh River - Sangtuda 1 (Construction, operation and transmission), with the participation of Inter RAO UES;

– Sangtuda-2 HPP construction project with the participation of a private partner from the Islamic Republic of Iran - Sangob company .

Also recent PPP projects:

– In the social sector: project "Reconstruction and management of kindergarten No. 133 of the city of Dushanbe", based on the Public-Private Partnership Agreement dated September 22, 2016 between the contracting authority (Ministry of Energy and Water Resources) and the private partner Boychechak LLC on the amount of 8 million somoni, for a period of 10 years.

– In the field of energy: project "Construction of a power line in the territory of the Free Economic Zone" Dangara according to the Agreement dated December 22, 2016 between the contracting authority (Ministry of Energy and Water Resources, OJSHC "Barki Tojik", Administration of the FEZ "Dangara") and a private partner Shanxi _ Coal Coorproation" in the amount of 22.8 million US dollars, for a period of 8 years.

– In the field of healthcare: project "Creation of a center to combat the hepatitis virus" in accordance with the Agreement dated August 16, 2017 between the contracting authority (Ministry of Health and Social Protection of the Population) and the private partner LLC "Tochikinnovatsia" in the amount of 20 million somoni, for a period of 15 years.

– In the field of transport: project "Electronic fare collection system and its control in public passenger cars in the city of Dushanbe", contracting authority the executive body of the state power of Dushanbe and private partner Avesto Group LLC. According to the feasibility study, the implementation period is 5 years and the import of the latest technologies in the field of transport is envisaged. For these purposes, 2.6 million US dollars will be attracted

Regarding the water supply sector, the following PPP project was recently signed:

– Project "Providing the population of the jamoat Isfisor Bobojon Gafurov district of Sughd region with clean drinking water. This project was signed in January 2020 with a private partner Bilol-2017 LLC for a period of 35 years. The project provides financing from the partner of 1.8 million somoni for the construction of water supply systems with a length of 12.5 km and the construction of 3 wells.

3. Analysis of tariff formation for water supply services

3.1. Payments for water withdrawal

There are no payments for water withdrawal in the irrigation and melioration sector. Water intake from natural sources is carried out on the basis of a Permit for Special Water Use (RSV), which is issued by the Committee for Environmental Protection under the Government of the Republic of Tajikistan for a period of 3 to 25 years.

In the drinking water supply sector , groundwater abstraction is paid as a tax on subsoil users (royalty) . Royalty payers are enterprises extracting groundwater, regardless of whether they were supplied to the population in the reporting period. The object of taxation is the volume of groundwater extraction, calculated in cubic meters. Royalty rates for groundwater extraction are determined by the Government of the Republic of Tajikistan (Article 236 of the Tax Code of the Republic of Tajikistan).

In the hydroelectric power sector , enterprises that produce or generate electricity from hydroelectric power plants through the use of water bodies are Payers of water royalties.

The tax base is determined as the amount of electricity produced during the tax period without taking into account losses during its further transmission (supply) and is determined by the taxpayer separately for each water body.

It provides for exemptions from paying royalties for water for the use of water facilities for the purpose of generating electricity with a capacity of energy generating facilities not exceeding 1,000 kilowatts.

Royalty rates for water are set for the use of water bodies for the purpose of generating electricity in the amount of 0.06 of the indicator for calculations for every 1000 kilowatt / hour of electricity generated as of the end of the tax period.

In general, water supply services in the country are considered to be such services as drinking water supply, heat supply (hot water, irrigation water supply, water supply for fish ponds, tourism and recreation on the water. Tariffs for water supply are formed for these services.

3.2. Drinking water supply and sanitation

For this area, for the purpose of drinking water supply, water is withdrawn from natural sources, a water management facility or a water conduit, for its accumulation, purification, disinfection and transportation of water using drinking water supply systems to the consumer.

After use with the help of drainage systems designed for receiving, transporting, cleaning and disinfecting wastewater and their sediments to the established requirements, before disposal or discharge into water recipients of treated wastewater , the used water is drained.

Water supply and sanitation services are provided to individuals and legal entities. For the provision of these services, tariffs are calculated in accordance with two legal acts, including the Regulation on the calculated cost of products (works, services) at enterprises and organizations of the Republic of Tajikistan, which was approved by the Decree of the Government of the Republic of Tajikistan dated May 12, 1999, No. 210 and The procedure for developing tariffs for drinking water supply and sanitation services of the Decree of the Government of the Republic of Tajikistan dated June 23, 2020 No. 364, including the Decree of the Government of the Republic of Tajikistan dated April 30, 2011 No. 234 "On approval of the Rules for the use of public water supply and sewerage systems in the Republic of Tajikistan".

For the development of tariffs, the cost of services is determined. The calculation of the cost price is determined by the stages of the technological process and by the cost items of the cost calculation. When calculating the total volume of water, losses in networks, depending on the state of fixed assets, up to water meters, no more than 20% are taken into account.

The cost includes the cost of water treatment, the cost of pumping wastewater, calculations

Below is a grouping of costs by stages of the production process and an item for calculating drinking water supply and sanitation services for calculating tariffs.

Table 8. Grouping costs by stages of the production process and an item in the calculation of drinking water supply and sanitation services for calculating tariffs

Water supply	Water disposal
I. Water lifting	II. Water lifting
- electricity	- electricity
- depreciation	- depreciation
- repair and maintenance	- repair and maintenance
- labor costs	- labor costs
- contributions for social needs	- contributions for social needs
- general operating expenses	- general operating expenses

- general expenses	- general expenses
III. Water treatment	IV. Waste water treatment
- materials (chemical reagents)	- materials (chemical reagents)
- electricity	- electricity
- depreciation	- depreciation
- repair and maintenance	- repair and maintenance
- labor costs	- labor costs
- contributions for social needs	- contributions for social needs
- general operating expenses	- general operating expenses
- general expenses	- general expenses
V. Water supply (water transportation)	VI. Transportation and disposal
- electricity	- electricity
- depreciation	- depreciation
- repair and maintenance	- repair and maintenance
- labor costs	- labor costs
- contributions for social needs	- contributions for social needs
- general operating expenses	- general operating expenses
- general expenses	- general expenses

3.3. Heating supply area providing hot water

SUE "KMK" must also provide heat supply to the population. However, some boiler houses of this enterprise at the level of districts and cities, which were built in the 60-80s of the last century, do not function. As of January 1, 2019, there were 1,171 boiler houses in the country for supplying water for heat supply. Out of this amount, 409 units are in working condition, 633 are not working and 129 are beyond repair.

At the moment, heat supply is carried out only in Dushanbe, where about 60% of multi-storey buildings are covered by centralized heat supply. This service is provided by the State Institution "Thermal networks of Dushanbe city" of the executive body of state power of the city of Dushanbe.

OJSHC "Barki Tojik" has its own price list to provide the State Institution "Thermal networks of Dushanbe city" with hot water. The price list tariffs apply to heat energy supplied to consumers by energy supply organizations and enterprises of OJSHC "Barki Tojik" and through wholesale consumers-resellers.

Consumers of thermal energy (hot water and heating) are divided into the following groups:

Group I - institutions and governments financed from budgetary funds

Group II - wholesale consumers – the institution "Thermal networks of Dushanbe city" of the Executive body of state power of Dushanbe

Group III - all other consumers not included in groups I and II

According to the price list of OJHC "Barki Tojik" dated 2109, Price list for No. 09-01-2019 Tariffs for electricity and heat energy, the following tariffs are established.

Table 9. Heat tariffs

No.	**Thermal energy**	**Somoni for 1 Gcal (excluding VAT)**
1.	For institutions and governments financed from budgetary funds	98.67
2.	For the SI "Thermal networks of Dushanbe city" of the Executive body of state power of Dushanbe	17.0
3.	For all other consumers	113.47

The tariffs specified in this price list are applied to settlements with all consumers, except for the population (domestic needs)

When thermal energy is sold by an energy supplying organization directly to the population living in residential buildings that are in the personal use of citizens (for domestic needs), payments for thermal energy are made at the rates of payment for central heating and hot water supply in force on the territory of this settlement.

The SI "Thermal Networks of Dushanbe city" provides heat to 2762 objects in Dushanbe. Including 2211 residential buildings, 64 medical institutions, 172 schools and kindergartens, 315 enterprises and organizations.

This institution provides heat to city facilities through heating networks that are on its balance sheet.

Tariffs for the population is 1.18 somoni per 1 square meter of heated area, including VAT. For budgetary organizations - 98.67 somoni per 1 Gkcal of heat (excluding VAT), for all other consumers - 113.47 somoni per 1 Gkcal of heat (excluding VAT).

3.3.1. Land reclamation and irrigation

Irrigated agriculture is an important component of agricultural development. The water industry has historically been a sustainable economic unit. This is due, first of all, to the fact that this industry is strategic for any state and society and is associated with ensuring socio-economic and political stability in society.

The country's potential irrigation area is more than 1.5 million hectares. However, to date, only 762 thousand hectares of irrigated areas have been developed. Of this area, 550 thousand hectares are irrigated by the melioration and irrigation system. The remaining irrigated areas are irrigated with the help of vertical wells, mountain irrigation systems, the source of which is small rivers, sai (seasonal rivers), from springs, etc. , which are not included in the system of the ALRI.

For land irrigation, ALRI takes water from natural sources, accumulates it in reservoirs, lifts, transports and distributes water to consumers through an irrigation network and diverts water through drainage networks.

However, after gaining independence in the 90s and the transition to market relations, funding for the melioration and irrigation system decreased, which negatively affected the maintenance and operation of water management systems in this area.

In this regard, in order to attract additional funds and regulate the economic activity of the industry, Decree of the President of the Republic of Tajikistan dated April 8, 1996 No. 460 “Introduction of payment for water supply services to consumers from state and irrigation systems of the Republic of Tajikistan”.

In the same year, the Decree of the Government of the Republic of Tajikistan dated June 25, 1996 No. 281 approved the “Regulation on the procedure for charging fees for water supply services to consumers from state irrigation systems.

Based on this, consumers who take water from the AMI system conclude contracts for the delivery of water. Tariffs for water delivery are set by the Antimonopoly Service under the Government of the Republic of Tajikistan. The cost of the tariff is calculated on the basis of the "Regulations on the calculated cost of products (works, services) at enterprises and organizations of the Republic of Tajikistan", which was approved by the Decree of the Government of the Republic of Tajikistan dated May 12, 1999, No. 210.

The water industry of the country is serviced by various branch repair and restoration enterprises, construction and repair divisions. The entire water management infrastructure has been built over many decades of the last century, and at present the issue is to maintain the existing water management potential. A distinctive feature of the irrigation infrastructure of Tajikistan is that it is built in a difficult terrain, and therefore failures and accidents often occur, and relatively high maintenance and operation costs are required.

Most watercourses in Tajikistan are distinguished by large slopes, weak rocks that make up the riverbeds, high flow rates and high water turbidity. Sediment inflow together with the water taken from the river leads to silting of the canals of irrigation systems and leads to a significant loss of their throughput up to 70-80%, sediment deposits in the nodes of structures complicate water distribution and worsen operation. Solid fractions of sediments abrade the surfaces of facing materials, often on rivers they wash away the surface of facing materials of siphons passing through the river, passing through the pump turbines, it deforms the walls of the pumps and renders the impellers of pumping units unusable, which leads to additional annual costs for the restoration and operation of hydraulic structures.

According to technical equipment, irrigation systems are divided into 4 categories.

The first category - modern irrigation systems occupy an area of 280 thousand hectares, have a stable water intake, channels are mainly made in a concrete channel or trays, with closed pipelines with all hydraulic structures.

Irrigation systems of the second category on an area of 185 thousand hectares, main canals without anti-filtration clothing, are not sufficiently equipped with hydraulic structures. The economic network, mainly in an earthen channel, is not sufficiently reinforced with structures and water-measuring devices.

The third category includes systems on an area of 200 thousand hectares. Large main canals are equipped with water intake facilities, the irrigation network has been largely rebuilt. The on-farm network, with the exception of some massifs, is earthen, not equipped with hydraulic structures and hydroposts.

The fourth category includes irrigation systems on an area of about 53 thousand hectares. ha insufficiently reinforced with structures. Irrigation is carried out on separate small arrays.

As a result of excess physical wear and tear, system failures often occur. Of the total length of inter-farm irrigation canals in the country, only 39% are lined with concrete or made in reinforced concrete trays, and of the total length of the on-farm irrigation system, only 35% are made in concrete lining, trays and pipelines.

At present, the maintenance and operation of the irrigation and drainage network includes the following:

a) Maintenance and repair of hydrotechnical systems of reservoirs;

b) current repair of channels, pipelines, structures, collectors and drains, pumping and power and hydromechanical equipment, wells, pressure pipelines, transformer substations and power lines, operational roads, bridges and communication lines, administrative buildings and structures of other auxiliary infrastructure;

c) overhaul of all listed in paragraph a);

d) purchase of equipment and spare parts for pumps, hydromechanical, power equipment and facilities;

e) cleaning of the State irrigation and collector-drainage network;

f) payment for consumed electricity by water facilities;

g) costs for the Feasibility Study, pre-project and design development, scientific research;

h) depreciation deductions for the restoration of the value of fixed assets;

i) employees' wages

Based on these costs, the cost of the provided service is calculated.

Therefore, currently the current tariffs for water supply services do not cover the costs associated with the operation and maintenance of these systems.

For example, the cost of water by gravity method is about 8 dirams per $1m^3$ of water and by machine irrigation from 8 to 12 dirams per $1m^3$ of water.

4. Conclusions

At present, the main issue that needs to be urgently addressed is the creation of a sustainable economic mechanism for the functioning of the water sector system and its adaptation to the system of developing market relations in Tajikistan. In particular, this implies that the revenues of water management organizations from the provision of irrigation water supply and water diversion services in the long term should be sufficient to cover the costs of managing, operating and maintaining, restoring and replacing worn-out water infrastructure.

In the short term, budgetary and donor funding can be used to cover the gap in new investment, but in the long term, the modernization and development of water infrastructure should be planned to be ensured mainly through the mechanism of return on investment, including investments from funds raised in the market.

Existing experience shows that it is not possible to fully cover all the costs of activities of water management organizations in the water sector at the expense of their own income. In this regard, in Tajikistan it is necessary to improve the targeted subsidization of part of the costs in water sector organizations.

Also, in the current stage of the water sector reform, all actions should be aimed at improving the economic foundations for the sustainable functioning of the water system with the support of the Government of the Republic of Tajikistan and development partners.

In this regard, in order to attract additional funds to the water sector, it is necessary to introduce PPP mechanisms, where this is possible in accordance with the regulatory legal acts of the Republic of Tajikistan.

Considering the issues of financing the water sector in various sectors, the following main conclusions can be developed.

1. Based on the above analysis, for the sustainable maintenance and operation of water infrastructure, it is necessary to attract additional funds, since the need for the maintenance and operation of water infrastructure is several times higher than the actual budget formed at the expense of the republican, local and water supply services to water consumers.

2. The cost of water supply services is several times higher than the established tariff for water supply services; therefore, the tariff does not cover the costs associated with the operation and maintenance of water management infrastructure.

3. The increase in tariffs for electricity consumption by pumping stations is not considered in conjunction with tariffs for water supply services. Since with an increase in the tariff for electricity, the tariff for water supply services remains unchanged, which leads to receivables and payables of water management organizations.

4. Differentiated tariffs for the land reclamation and irrigation sector are not applied, for example, in the zone of gravity irrigation, in the zone of mechanical irrigation, in the zone of mixed irrigation and in the zones of irrigation by upland canals.

5. Service areas for water delivery are not fully covered by electronic payment of water users through banking systems. The water management system still uses cash payment for water supply services.

6. Investment projects are mainly focused on the modernization, restoration and construction of water infrastructure facilities, improving institutional mechanisms in the framework of reforms. At the same time, it is necessary to strengthen the financial mechanism for the sustainable maintenance and operation of water management systems, restored or built as part of investment projects.

7. For the sustainable operation and maintenance of water infrastructure, the Government of the Republic of Tajikistan has created a PPP mechanism that can attract additional funds to the water sector.

8. The PPP mechanism, as the existing experience and practice shows, can be applied in any areas of the water sector, except for water infrastructures of strategic importance. But the law on PPP does not prohibit the use of the PPP mechanism for new water facilities under construction, if it does not have a strategic purpose.

9. Regulatory acts in the system of drinking water supply and sanitation more clearly regulate the introduction of the PPP mechanism in this area than in the system of land reclamation and irrigation.

10. In the land reclamation and irrigation system, the PPP mechanism can be applied and individuals and legal entities can be granted the right to manage state-owned water management facilities within a limited area where on-farm water management systems are located.

5. Basic recommendations

Based on the above conclusions, the following recommendations are made for attracting additional financing to the water sector, including through the implementation of the PPP mechanism and the consideration of tariffs. Below are recommendations for two main sub-sectors, incl. for drinking water supply and diversion and for land reclamation and irrigation.

5.1. Drinking water supply and sanitation subsector

For the drinking water supply and sanitation subsector, the following is recommended:

– improving the access of the population to clean drinking water and increasing the level and quality of services in the industry using the PPP mechanism;

– construction of facilities and centralized drinking water supply systems in rural areas of the republic at the expense of PPP;

– construction of enterprises for the production of pipes, especially polyethylene and fiberglass, for transporting drinking water and sanitation;

– development and implementation of investment projects based on the PPP mechanism for domestic and foreign investors, construction and reconstruction plans, as well as equipping industry enterprises with modern equipment and technologies. For this, PPP investment projects must be profitable and attractive;

– purchase and installation of drinking water meters throughout the country;

– implementation of a set of measures related to the improvement of the financial situation of enterprises in the industry and the return of loans attracted to the industry;

– taking into account regular changes in the cost of electricity, fuel, production materials of the industry, interest rates on bank loans, in order to ensure the proper functioning of the industry, it is necessary to revise the price lists of services based on an objective assessment of the costs for the maintenance and operation of water management systems;

– updating the system of retraining of personnel for the sphere of housing and communal services in educational institutions of secondary vocational education;

– introduction of a system for obtaining additional specialized education for specialists of public utilities, adjustment of the qualification level of industry specialists in order to ensure the effective use of equipment and technologies, an automated system for calculating fees for services using modern programs;

– Prepare a guideline or legal act on the establishment of WUAs in the drinking water supply and sanitation system, since the law on WUAs has been developed and adopted for the land reclamation and irrigation subsector;

– Develop a guidline for the implementation of the PPP mechanism in the subsector of drinking water supply and sanitation.

5.2. Land reclamation and irrigation subsector

1. To increase the economic sustainability of the functioning of the land reclamation and irrigation system, it is necessary to solve the following tasks:

– Unblocking an undesirable but persistent “vicious circle”: inefficient management and inefficient financial mechanism - provision of poor quality water supply services - increase in debts of households to water service providers and increase in debts of water management organizations to electricity suppliers - aging water infrastructure - deterioration of maintenance and operation in ALRI and further again a circle;

– Restoration and development of the water metering system, using modern technology, introduction of automated water metering;

– Creation of an effective economic mechanism for financing the maintenance and operation of the irrigation and drainage system based on actual needs to prevent the destruction of infrastructure and reduce the quality of services provided;

– Implementation of penalties for excess use and pollution of water;

– Development of cooperation and agro-service in irrigated agriculture, ensuring improved access of farmers to credit resources and markets, increasing their profitability and ability to invest in the sustainable functioning of the irrigation complex. The ongoing reform in agriculture will provide an opportunity to effectively address these problems.

– Improving the methodology for calculating differentiated tariffs for water supply, collection and disposal of drainage water based on official normatively justified water use plans;

– Improving the methodology for calculating membership fees for WUAs, taking into account the cost of services provided by water supplying organizations and internal costs for maintenance and operation carried out by the WUAs themselves within their service areas;

– Improving the mechanism of financial relations between water management organizations, WUAs and water users based on the introduction of an electronic payment system for water supply services through the banking system on a non-cash basis;

– Improving the transparent mechanism of state subsidies for the use of electricity, with particular attention to the lifting of water by pumps to a height of 100 meters or more;

– Introduction of vacant, saline and swampy irrigated lands into agricultural circulation, as well as those subject to these processes, as an alternative measure to the development of new lands;

– Establishment of a specialized reclamation fund to finance reclamation and irrigation activities.

– Development of new lands with machine water lifting to a height of 100 meters or more with mandatory inclusion in development projects, introduction of water-saving and soil protection technologies, improvement of existing irrigation technologies in combination with the cultivation of highly profitable agricultural crops in demand by the market;

– Creation of a system of tax incentives to stimulate the introduction of water-saving technologies (drip and drip-furrow irrigation, micro-sprinkling, automation of water distribution systems and other technologies), especially in the pumped irrigation zone;

– Development and implementation of incentive mechanisms for the population and farmers to invest in the improvement of irrigation and drainage systems;

– Directions of international investments for the purchase of energy-saving pumping and power units for the modernization of pumping stations, as well as the purchase of specialized machines and mechanisms for the renewal of the machine park;

– Raising the qualifications of employees of water management organizations at all levels of the WUA and the WUA Union, exchange of experience in countries with developed and developing systems of land reclamation and irrigation;

– Develop a regulatory sectoral law on land reclamation and irrigation, a program for the development of the land reclamation and irrigation sector, as well as other regulatory legal acts that contribute to the economic development of the sector.

2. For the implementation of the PPP mechanism in the land reclamation and irrigation sector, the following are recommended:

– According to the Water Code of the Republic of Tajikistan, it is necessary to develop a legal act “Guidelines for the implementation of the PPP mechanism in limited areas where on-farm irrigation systems are located”;

– Establish value chain clusters based on PPP in limited areas;

– Develop guidelines for the introduction of PPP in the land reclamation and irrigation sector, introduce it into the program for the development of land reclamation and irrigation, a separate paragraph for the introduction of PPP in this sector;

– Apply the PPP mechanism for the development of new lands using water-saving technologies, for example, in Tajikistan there are more than 1.5 million hectares of lands suitable for irrigation and at the moment half of them have been developed. For this, among other things, it is possible to imagine a PPP mechanism in the construction of small reservoirs, taking into account land development by gravity.

– Develop and approve a real tariff for the PPP mechanism, for the return on investment through the provision of services, taking into account the payback period;

– Develop a list of projects in the field of land reclamation and irrigation for PPP and submit for consideration by the State Institution "Center for the Implementation of Public-Private Partnership Projects";

– Carry out various events to highlight the implementation of PPP mechanisms through the media and consider the implementation of the PPP mechanism at meetings of the National Commission for Irrigation and Drainage in the Republic of Tajikistan.

Annexes 1. Action plan for the implementation of the water sector reform in the Republic of Tajikistan in 2016-2025

thousand somoni

№	Actions/Events	Executive agency	Implementation period										Centralized republican budget	Development Partners	Total
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Legislative and Regulation Development														
1	Adoption of a new Resolution of the GoT on approval of the Regulations on the powers of specially authorized state bodies for the use and protection of waters	MEWR, MJ, ALRI, KMK, CEP,	90											90	90
2	Analysis and consideration of a new edition of the Regulations or other documents regulating the activities of ministries and departments involved in the management of water resources. Periodic revision of these documents	MEWR, MJ, ALRI, KMK, CEP	160								10	10	20	160	180
3	Organization and holding of the River Basin Dialogue on IWRM in 4 basins (4 meetings per year)	MEWR, LEBSP, ministries and	312	312	312	312	104	104	104	104	104	104	50	1822	1872

		departments													
4	Development of draft National Water Strategy and submission to the Government for consideration and adoption	MEWR, ALRI, KMK, CEP, WUA,	5	140	120								5	260	265
5	Analyze the development of the draft Water Code of the Republic in a new edition	MEWR, ALRI, KMK, CEP, WUA			85	85								170	170
6	Development of a draft program for the development of land reclamation and irrigation	ALRI, ALRI-region. district, WUA	160	140										300	300
7	Introducing amendments and additions to the Law of the Republic of Tajikistan "On Water Users Associations"	ALRI, MEWR, WUA, IM&D	80	60										140	140
8	Analysis of the implementation of the Program for providing the population of the Republic of Tajikistan with clean drinking water and the development of its new	KMK, MEWR, IM&D	250	250										500	500

	version for the period up to 2030														
9	Development of the draft Law of the Republic of Tajikistan "On Land reclamation and Irrigation"	ALRI, MEWR, CEP, WUA	120	10										130	130
10	Analysis and development of proposals for amendments and additions to the Law of the Republic of Tajikistan "On drinking water"	KMK, MEWR, CEP, LEBSP	70	60										130	130
11	Development of the Program for the restoration and development of the water supply infrastructure of industrial enterprises and their equipment with modern water meters	MINT, MEWR, LEBSP cities, owners, CEP	70	140										210	210
12	Development of a long-term basin plan for the use and protection of water resources in 4 river basins, their periodic updating	MEWR, RBO, IM&D, CCWEI	5000	5000							50	50	100	10000	10100
13	Development of seasonal and annual plans for the distribution and management of water resources in river basins	MEWR, RBO, IM&D		1000	1000	5	5	10	10	10	10	10	60	2000	2060

14	Development of procedures and guidelines for transferring to WUAs balance sheet or transfer of rights to manage the irrigation and drainage network of the third order (on-farm and other related infrastructure)	ALRI, WUA			65	65							130	130
15	Study of the economic state and development of recommendations to improve the financial and economic sustainability of organizations providing water supply services in the water sector	MEWR, ALRI, KMK, CEP, WUA		108	108	108	108						432	432
16	Development of a new methodology for determining tariffs for irrigation and drinking water supply services, allowing full coverage of costs and development of these sub-sectors Submission for approval to the Goverment	MEWR, ALRI, KMK, МФАМС, WUA		80	80	60	60						280	280
17	Development of a draft of other legal acts of the water sector	MEWR, IM&D	10	10	10	10	10	10	10	10	10	10	50	50	100
18	Development of drafts of other normative and regulatory documents of the water sector	MEWR, IM&D	15	15	15	15	15	15	15	15	15	15	75	75	150

	Institutional development														
19	Establishment of 4 river basin working groups and support for their activities within the framework of development partner projects	MEWR, LEBSP	1092	1092	1092									3276	3276
20	Provision of office space to 4 RBO and 4 under RBO organization and providing them with office equipment (computer, printer and other accessories) and vehicles until the end of 2018 and their budget financing from 2019	MEWR, LEBSP	650	1300	650									2600	2600
21	Permanent financing of 4 RBO and 4 under RBO organization from the state budget	MEWR, MF				1681	1681	1681	1681	1681	1681	1681	11767		11767
22	Establishment of the River Basin Council (RBC) in 4 basins and support for their activities by development partners	MEWR, RBO, ministries, organizations, CCWEI				312	312	312	312	312	312	312		2184	2184
23	Strengthening existing WUAs and establishing new WUAs	ALRI, LEBSP	5330	29315	31200	16575	4225	50	50	50	50	50	250	86645	86895
24	Transfer of WUA activities from the boundaries of jamoats and districts to hydrographic boundaries	ALRI, LEBSP	65	260	260	28535	22230							51350	51350

	Восстановление инфраструктуры														
25	Inventory of fixed assets of irrigation and drainage, especially those that will be transferred to WUAs	ALRI, WUA		350	350	350	350							1400	1400
26	Development of the Irrigation Infrastructure Rehabilitation Financing Plan. Update of this Plan	ALRI, MF ВРИС MEWR	325	325	325	325					50	50	100	1300	1400
27	Rehabilitation of irrigation infrastructure and improvement of conditions for maintenance and operation of infrastructures	ALRI, MEWR	102168	95550	158665	64350	39195	36000	36000	36000	36000	36000	90000	549928	639928
28	Rehabilitation of water supply and sanitation infrastructure	MEWR, KMK, LEBSP, big cities	108550	335205	227305	115700	26000	26000	26000	26000	26000	26000	65000	877760	942760
29	Replacing worn-out operation and maintenance mechanisms with modern and new ones for the infrastructure of the water sector	MEWR, ALRI, KMK	3000	6500	12000	12000								33500	33500
	Auxiliary means of water sector reform														
30	Creation and development of the database and information system of the water sector	MEWR, ALRI, KMK, CEP, CoES and CD	195	195	195	195	195	30	30	30	30	30	150	975	1125

31	Strengthening the capacity of water sector organizations and water users	MEWR, ALRI, KMK, CEP, WUA	1200	1200	1200	1200	1200	50	50	50	50	50	250	6000	6250
32	Strengthening the capacity of organizations responsible for the management of water resources of transboundary rivers, support for the development of regional and international water relations	MEWR, MoFA, CEP, ALRI, IM&D	100	100	100	100	100	30	30	30	30	30	150	500	650
33	Organization of seminars, conferences and other public events dedicated to the use and protection of water resources	MEWR, MoFA, CEP, ALRI, KMK и IM&D	50	50	50	50	50	50	50	50	50	50	167	333	500
34	Training and advanced training of young professionals, workers and managers of organizations in the water sector in developing and developed countries	MEWR, MoFA, CEP, ALRI, KMK	100	100	100	100	100	100	100	100	100	100	333	667	1000
35	Organization of research work to improve the efficiency of water resources use	MEWR, CEP, ALRI, KMK, AH	100	100	100	100	100	100	100	100	100	100	333	667	1000

	Total		229267	479057	435387	242233	96040	64542	64542	64542	64652	64652	168860	1635964	1804824

Note: In addition to line 21, the financing of the activities provided for by the Plan at the expense of the state budget (column 14) is carried out within the existing current annual budgets of state organizations

Abbreviations

GIZ	German Society for International Cooperation
SDC	Swiss Agency for Development and Cooperation
ADB	Asian Development Bank
WUA	Water Users Association
ALRI	Agency for Land Reclamation and Irrigation under the GoT
AMS	Antimonopoly Service under the GoT
AS	Academy of Sciences of the RT
DB&IS	Data base and Information system
RBO	River Basin Organization
RBC	River Basin Council
MEDT	Ministry of Economic Development and Trade of the RT
MDG	Main Department of Geology under the RT
SUE	State unitary enterprise
EU	European Union
IM&D	Interested ministries and departments

IWRM	Integrated Water Resources Management
CEP	Committee for Environmental Protection under the GoT
CCWEI	Coordinating Council under the Government of the Republic of Tajikistan on Water and Energy Issues
CoES and CD	Committee for Emergency Situations and Civil Defense under the GoT
MHSPP	Ministry of Health and Social Protection of Population of the Republic of Tajikistan
MoFA	Ministry of Foreign Affairs of the Republic of Tajikistan
LEBSP	Local Executive Bodies of State Power
ICWC	Interstate Commission for Water Coordination
MINT	Ministry of Industry and New Technology of the Republic of Tajikistan
MA	Ministry of Agriculture of the Republic of Tajikistan
MF	Ministry of Finance of the Republic of Tajikistan
MEWR	Ministry of Energy and Water Resources of the Republic of Tajikistan
MJ	Ministry of Justice of the Republic of Tajikistan
NWC	National Water Council
OJSHC	Open Joint Stock Holding Company
UNDP	United Nations Development Program
GoRT	Government of the Republic of Tajikistan
SSESS	State Sanitary and Epidemiological Surveillance Service of the Ministry of Health and Social Protection of the Population of the Republic of Tajikistan

KMK	Khojagii manzilyu kommunali
USAID	United States Agency for International Development

Water Sector Financing in Turkmenistan

By Dovlet Jumakuliev

CONTENT:

List of abbreviations:

ASBP	Aral Sea Basin Assistance Porgramme;
CDN -	Collector-drainage network;
EC IFAS-	Executive Committee of International Fund for Saving the Aral Sea;
ES -	Economy Society;
FOB-	Free On Board;
GDP -	Gross Domestic Products;
ICWC-	Interstate Commission on Water Coordination;
ICSD-	Inter-stet Committee on Sustainable Development;
IFAS-	International Fund for Saving the Aral Sea;
JSC-	Joint Stock Company;
MAEPT -	Ministry of Agriculture and Environmental Protection of Turkmenistan;
SCWMT -	State Committee for Water Management of Turkmenistan
SDG	Sustainable Development Goals;
SRW-	Soft Red Winter, kind of American wheat.
PA -	Production Association
PD -	Production Directorates

Section 1. The current state of the water sector in Turkmenistan, sources of its financing and priorities for further development.

i. Review of the current state of water management reforms in Turkmenistan.

Water resources are a foundational element of the economic growth and well-being of Turkmenistan. The geographical location of the country, the climate peculiarities of the region and water supply due to trans-boundary river flow requires the rational use of water and maintaining a balance of its distribution between the sectors of the economy and social life and ecosystems. Water resources provide water not only agriculture sector, but also other sectors of the economy and social sphere of the country. For this reason, water resources, their incoming flow volumes, use, distribution, rational consumption are the subject of special attention from the government side and define the nature of the ongoing reforms (and consequently financing). The value of water as a national wealth and the requirements for its necessary rational use are enshrined in article 14 of the main law of the state - the Constitution of Turkmenistan.

The aggregate of all water bodies, lands occupied by them, including those rendered for water protection areas and shoreline belts constitute the State Fund of Water Resources of Turkmenistan and include:

- rivers, reservoirs, lakes, irrigation and drainage canals, including other surface water bodies and streams;
- groundwater;
- The part of the water area of the Caspian Sea located within the borders of Turkmenistan also forms the country's water resources.

The largest part of the water resources of Turkmenistan is surface runoff. From geographical point of view, spatial distribution is exceptionally uneven. At the average, the total water resources are estimated at 25 km^3 a year. The predominant share of the country's fresh water resources originates from trans-boundary basins (more than 95%). The river runoff formed within the country is only 1.55 km^3 or 1.2% of the Aral Basin. The uneven flow of rivers is significantly balanced by a water storage reservoirs system along the rivers and the Karakum River. Now, there are 16 reservoirs of different sizes in the country.

The water resources of Turkmenistan are formed from the surface runoff of the Amu-Darya, Murghab, Tejen, Etrek rivers, small runoffs on the northeastern slopes of the Kopetdag and minor volumes of underground and collector-drainage water. The Amu-Darya River provides 22 bln. m^3 or 90% of the total volume of surface water resources. The remaining volume is provided as follows: by the Murghab River - 1.631 bln. m^3 (6.5%), the Tejen River – 0.869 bln m^3 (3.5%), the Etrek, Sumbar and Chandyr Rivers – 0.354 bln. m^3 (1.4%) and small rivers – 0.15 bln m^3 (0.6%).[1]

Now the water resources of Turkmenistan are used in full. At the same time, the country mainly receives water resources from trans-boundary watercourses according to the agreed water distribution quotas (also within the scope of Inter-state Commission for Water Coordination of International Fund for Saving the Aral Sea). Specifically, Turkmenistan is heavily dependent on

[1] REPORT on the evaluation of investment and financial receipts to address climate change issues in the Water Sector (Russian version), стр.3// undp-iff-turkmenistan-assessment-water-ru%20(4).pdf

water supply from the Amu-Darya. In recent years, as a result of significant shrinkage of water content in other rivers supplying the country, now it can be said that more than 90% of the total surface runoff accounts for more full-flowing Amu-Darya River (in previous years the share was 88%). According to the "Agreement between Turkmenistan and the Republic of Uzbekistan on cooperation over water management issues" valid since 1996, water allocation of the Amu-Darya runoff (arranged at the shutter of the Kerki water measuring station) is carried out in equal shares - 50 to 50 percent (22 km^3 on the average). Out of this volume, 12-13 km^3 are taken by the Karakum River (1100 km long), and 3-5 km^3 and 4.5-7.5 km^3 - by the irrigation systems of Lebap and Dashoguz regions respectively.

The average long-term volumes of return waters are estimated at approximately 6 km^3 a year, of which the majority are collector-drainage waters. Industrial and municipal waste drains do not exceed in total 0.35 km^3 a year.

190 fresh, briny, and saline water aquifers represent the groundwater reserves of the country, among which 130 aquifers have been studied. Groundwater suitable for use is mainly located in distant hard-to-reach desert places and is typically used for grassland farming - for watering camels, sheep, goats through the construction of wells and boreholes. The operational reserved of these waters are estimated at 6 mln. m^3 a day, and the forecasted reserves are estimated on the average at 9 mln. m^3 a day.[2] The Hydrogeological Service of the country is constantly monitoring completed wells and exploration of new ones, thus increasing number of available groundwater aquifers. For example, in the end of June 2022, the Hydrogeological Service explored large fresh groundwater reserve adjacent to the middle stream of Amu-Darya in the territory of Lebap region. According to preliminary data, groundwater reserves across the country are estimated at 3.5 mln. m^3 a day.

The predominance of surface water sources determines their significant dominance in meeting the demands of the economy and the social sphere. The dynamics of water consumption shows an emerging trend towards a reduction in water intake for economic, industrial and social needs over the past 5 years (see Table 1).

Table 1.Consumption of water from water sources, mln m^3 (2017-2020 yy).[3]

Indicators	**2017**	**2018**	**2019**	**2020**
Water intake from natural sources, total	28 856,2	26 880,0	27 708,1	26 244,7
Including underground water tables	348,1	282,2	249,6	214,1

The main consumer of water resources in Turkmenistan is the agricultural sector. Farming in the regions with dry-land conditions is possible only with irrigation. In 2020, the agricultural sector consumed about 92% of the total consumable water amount, which included water consumption for irrigation, flooding and agricultural water supply (see Table 2).

Table 2. Consumption of water for production and economic needs, mln m^3.[4]

[2] Aganov, 2009; source of institute - http://sng.today/ashkhabad/.../.

[3] Statistical Yearbook of Turkmenistan, 2020 y, State Committee on Statistic of Turkmenistan, Ashgabat,2021, table 15.1, p. 316.

Distribution of water by economic sectors	Indicators in numbers	Percentage
Total in Turkmenistan, Including:	**17504,1**	**100%**
For irrigation and agricultural water supply	16 119,6	92,1%
For production use	931,0	5,31%
For economic and everyday needs	453,5	2,59%

The volume of water consumption for irrigation is more than 16300 mln m^3. Presently, the irrigated area of Turkmenistan is about 1595.6 thousand hectares.[5] At the same time, changes are taking place in the structure of crops as part of the ongoing reforms in the agricultural sector. Latest changes have affected an increase of crop acreage of more hydrophilous cotton and decrease of wheat crop areas (these two crops occupy more than 80% of the cultivated areas). In 2020, by the decree of the President of Turkmenistan, the wheat crop area was reduced from 760 thousand ha to 690 thousand ha.[6] The new territories were used for cotton cultivation, thus increasing cotton fields. In 2022, the cotton crop area amounted to 580 thousand ha,[7] being 30 thousand ha larger than in 2019 (550 thousand ha in 2019). Beyond that, as a result of the ongoing reforms in the country, since 2019 cotton also cultivated by private producers on the area of 25 567 ha, which was provided from a special agricultural land fund.[8]

Major reforms in the agricultural sector have started by the Resolution of Halk Maslahaty (People's Council) adopted in September 2018 - "On further enhancement of reforms in the agricultural sector". The reforms opened up opportunities to involve private agricultural producers in the cultivation of strategic crops - cotton and wheat, as well as to increase production of all agricultural products. According to the reforms, a special agricultural land fund was formed consisting of the lands of the peasant daykhan associations. On the basis of the Land Code of Turkmenistan, those producers who wish to produce agricultural products are allocated land territories for a period of 99 years. At the same time, 70% of the provided land territories are intended for the cultivation of cotton and wheat, and the other 30% - for the cultivation of other crops. The crops grown in excess of the government order can be sold by agricultural producers at free prices.[9]

Prices for purchase of wheat and cotton, which are grown according to the governmental order, get changed as well. Since 2019, purchase prices for wheat have doubled from 400 manats to 800 manats per 1 ton (equivalent to 228 USD). In order to further strengthen the food supply and create an abundance of food products the President of Turkmenistan signed a decree «On delivery to the state of the wheat crop production in excess of the plan for 2022» on 29th July of 2022. The document stipulates procurement from joint-stock companies, daykhan (peasant) farms, and other legal entities as well as from citizens (producers) of Turkmenistan, who

[4] Statistical Yearbook of Turkmenistan, 2020 y, State Committee on Statistic of Turkmenistan, Ashgabat,2021, table 15.8, p. 318.

[5] Statistical Yearbook of Turkmenistan, 2020 y, State Committee on Statistic of Turkmenistan, Ashgabat,2021, table 6.2, p.59.

[6] Gurbanguly Berdimuhamedov – Towards new heights of progress.// Selected works., Vol.13, Ashgabat, State publishing service of Turkmenistan, 2020, p.85

[7] Neutral Turkmenistan, July 28, 2022, p.1.

[8] Gurbanguly Berdimuhamedov – Towards new heights of progress.// Selected works., Vol.13, Ashgabat, State publishing service of Turkmenistan, 2020, p.85

[9] Gurbanguly Berdimuhamedov – Towards new heights of progress// Selected works., Vol.12, Ashgabat, State publishing service of Turkmenistan, 2019, p.78

received land plots from a special agricultural land farm, for per ton of the wheat crop produced in excess of the established state order for 2022 at a price of 1,600 (one thousand six hundred) manats which is equivalent to 458 USD. This is an efficient incentive for producers to ensure waste-free harvesting.

Comparing the purchase prices with the world ones, it may be noted that as per the analytical online-edition "Agroinvestor" in July-August we can observe the cost decrease for wheat in the world. FOB prices for Russian 12,5% protein wheat within July-August delivery decreased by $370 per ton. Prices in other countries also started to fall. Thus, the average FOB prices for American SRW wheat straightaway dropped to 43 $ - $316 per ton, the French with 11,5% protein - till $364 per ton (-$23/t), the German - $371 per ton (-$20/t).[10] The purchase price of wheat as per the state order of Turkmenistan in 2019 estimated at 228 dollars (of the USD equivalent) and this is below the global average. However, according to the information source «SNG.TODAY» an active support to producers from the government side covers more than 60%[11] of the cost of growing crops which significantly increases their income. Beside, a high incentive for agricultural producers to increase the yield of wheat is the establishment in 2022 of the purchase price for an excess crop- 458 USD per ton and this is much higher than the world one.

The prices for cotton are established with the consideration of quality characteristics.

The efficiency of preservation and use of available resources is achieved by the reforming of the country's water sector, which covers management system, upgrade and renewal of the infrastructure as well as financing.

Management reforms are conducted in close connection with agricultural reforms. Presently, the state governance is carried out together with the State Committee for Water Management of Turkmenistan (SCWMT) and the Ministry of Agriculture and Environmental Protection of Turkmenistan (MAEPT).

The direct state management of the country's water sector is entrusted to the State Committee for Water Management of Turkmenistan (SCWMT). The SCWMT was separated from the structure of the Ministry of Agriculture and Water Management of Turkmenistan as an independent management body in accordance with the decree of the President of Turkmenistan dated January 29, 2019 in order to further increase the efficiency of water resources management in the country. The State Committee heads the system of the water management authorities which are established to ensure the implementation of the state policy in the field of use and protection of water bodies. Along with the provision of domestic and drinking water supply and water supply to all sectors of economy, the main functions of the water management system are to provide water to the agricultural sector of the country and to implement a state policy in the field of land reclamation.

The water sector management of the country is interacted with the administrative-territorial and watershed management levels. The administrative-territorial level of water sector management is maintained region-wise by production associations - production association (PA) Ahalsuvhojalyk, Balkansuvhojalyk PA, Dashoguzsuvhojalyk PA, Lebapsuvhojalyk PA,

[10] https://www.agroinvestor.ru/analytics/news/38442-mirovye-tseny-na-pshenitsu-prodolzhayut-rezko-snizhatsya/

[11] https://sng.today/ashkhabad/8296-turkmenistan-v-dva-raza-podnjal-zakupochnye-ceny-na-pshenicu.html

Marysuvhojalyk PA. At the district level (the quantity is changed due to the administrative-territorial reforming), production directorates (PD) were established, for example, "Tejenetrapsuvhojalyk" PD. In practical terms, such production directorates are the main production units to manage the water resources of the country at the local level. The administrative-territorial management concept also assumes participation of local authorities, namely municipal administrations, in the distribution of water resources which sometimes results in predominance of the interests of local authorities while distributing water for production and economic needs.

Management of one of the main water courses of the country - Karakum River - is maintained according to a watershed management and imposed on Association Karakumderyasuvhojalyk (of both inter-district and inter-regional importance), which comprises 9 directorates along the Karakum River. Watershed management of this large watercourse is important from the perspective of equal metering and distribution of water stream along the bed. Association Karakumderyasuvhojalyk is also subordinate to the State Committee within its departmental structure. The State Committee structure also comprises construction and production organizations, which carry out irrigation, land-reclamation, cleaning, repairing and other works.

Government institutions of the water sector of the country comprise State Concern Turkmengeologiya (area of responsibility - groundwater), Hydrometeorological Service (subordinate to the Ministry of Agriculture and Environmental Protection of Turkmenistan) and services of Water and Sanitation Authority (being within of / subordinate to municipal government - municipal administrations). Inter-state watershed management level is implemented through Amu-Darya Basin Water Management Organization within the scope of Inter-state Commission for Water Management along the riverbed (coordinated by the Inter-state Commission for Water Management of International Fund for Saving the Aral Sea).

It should be noted that the Regulations on State Committee of Water Management stipulates an important innovation, in accordance with which the State Committee is carrying out its activity in direct cooperation or through subordinate organizations with local government agencies, including local and international organizations (clause 3, article 5 of the Regulations). The Regulations provide wide opportunities for cooperation and integrated management of water resources, along with engagement of innovative approaches and solutions within the activity of the water sector of the country.

At the same time, for purposes of achievement of the programme objectives and development of water management, the State Committee is empowered to coordinate activities of ministries, industry managerial organizations, including enterprises and organizations regardless of forms of ownership (clause 5, article 5 of the Regulations). It opens opportunity for cooperation with the private sector of the country and attraction of private investments for development of the water sector.

Specified regulations create legal prerequisites to openness of the State Committee to international cooperation and cooperation with the private sector for purpose of development of water economy, attraction of investments, innovations, and enhancement of the rational use of the water resources of Turkmenistan.

During the years of Independence the fundamental reforms have been implemented with regard to the management, use, operation and financing of water infrastructure facilities. The reform of water sector has been implemented according to the primary objective to supply the agriculture with sufficient amount of water. Based on this, modernization, construction and overhauling of water management facilities are underway and focused on creating additional water reserves in the country, improving the water supply to agricultural lands, and replenishing water loss. In this regard, the state provides for large investments for the construction of new reservoirs and for the capacity expansion of existing ones. This also includes activities to increase the throughput capacity of rivers, irrigation and drainage ditches.

Water supply of irrigated lands is also provided by help of 16 large reservoirs (15 of them have a total capacity of more than 3 km^3, including 1.25 km^3 of the Iranian - Turkmen "Dostluk" Reservoir Dam on the Tejen River), which are used as well as a source of water for other water consumption needs. These reservoirs are formed by large dams (according to the conclusion of the International Commission on Large Dams). The system of reservoirs is supplemented by several more reservoirs of small capacity. Turkmenistan is building new reservoirs in all regions, filled with the water of the Amu-Darya, the Murghab, the Tejen, the Etrek and other small rivers. It is important to note on the ongoing large-scale work to increase the capacity of large reservoirs - Syryyaz, Hanhovuz, "15 years of Independence" Zeiyd Reservoir.

The principles of interaction, cooperation and sharing began to prevail in the construction and operation of water bodies. The Iranian – Turkmen "Dostluk" Reservoir Dam on the Tejen River can serve as an example of joint construction efforts and financing of large water bodies using advanced water engineering technologies and building materials (see chapter 2, part 2).

In Turkmenistan, when designing water bodies, great importance is given to the rational use of water and application of technologies excluding filtration loss. For example, Turkmenistan has reservoirs, which were constructed using the most advanced building materials such as geo-membranes and geo-textile, which promote to decrease filtration loss and keeping up the storage capacity. These technologies were applied at the construction of Bagir reservoir in 2010 and Kaahkin reservoir in 2014. Water-saving technologies are of high priority when designing and constructing subsequent water bodies. The Ministry of Agriculture and Environmental Protection of Turkmenistan is planning to construct a new bed of Shasenem irrigation canal in Dashoguz region with the length of 100.2 km and water consumption of up to 60 cubic meters a second; the main requirement to a Contractor is laying of watertight lining on the bed. Provision is also made for construction of a reservoir of a capacity of 90 mln. m^3.[12]

Reforms in the water sector also stipulate the increase of the water balance of the country by means of desalination of sea water. In the framework of these strategic plans, started to be implemented in 2020, it was planned to construct two large desalination plants with a capacity of 1 mln. m^3 a day at the Caspian shore (in Kiyanly and Okerem), including facilities of power generation consisting of gas turbine and solar electric power plants, and to arrange transportation of desalinated water to a neighboring Ahal region. However, later on, the project estimation documentation was reconsidered for the decrease of production capacities and volume of work. The most probable reason is the financing problems. Nevertheless, in 2022 large-scale plans with regard to these intentions were announced at the high level. It is also planned to desalinate

[12] Neutral Turkmenistan, International tenders, July 7, 2022, p.4.

drainage discharge of the "Altyn Asyr" Lake ("Golden Age" Lake) which is under construction, and use waters of this reclamation object for irrigation purposes. By the government's decision, the project for the construction of wind and solar power plant with a capacity of 10 MW is going to start in July 2022. The plant will also be used for desalination of the "Altyn Asyr" Lake in Ak-Yayla (territory of the Balkan province, construction will be performed by a Turkish company "Gap Insaat").

ii. Review of the institutional management structure and financing infrastructure facilities of the country's water sector.

Under climate conditions of Turkmenistan, irrigation (and agriculture related thereto) is considered as a key factor in adaptation and preparedness for drought risks. As essential part, large-scale investments in the water sector and irrigation account for the significant part of the budget expenditures. For instance, the programme of the President of Turkmenistan for social and economic development of Turkmenistan for the period of 2019-2025 stipulates large-scale works on the development of the agricultural sector with due regard to recommendations for preparedness to climate risks. In this regard, financing of the water sector was closely tightened to the development of the agricultural sector. The programme of the President of Turkmenistan on the country's social and economic development for the period of 2019 – 2025 was transformed to a new large-scale Program of the President of Turkmenistan on the country's socio-economic development for the period of 2022 – 2028 and investments, goals and tasks envisaged in it, including the water sector, have been merged into one document. Since 2022 the program of the President of Turkmenistan on the country's social and economic development for the period of 2022 – 2028 has become the country's main document for the midterm development.

The programs approved by the government stipulate the public financing from the state budget, and direct investments in the agro-industrial sector, the modernization of water infrastructure and the public utilities of the country. As a rule, the state financing is directed towards implementation of large-scale projects.

For example, on January 9, 2015, the President of Turkmenistan approved the "Programme for the rational use of water resources of Turkmenistan and the increase of the throughout capability of Karakum Canal for the period of 2015-2020". The program objectives included the increase of the throughput capability of the Karakum Canal, the enhancement of management and supervision over the technical condition, and water measurement through repairing and recovery works and construction of a variety of water control structures and reservoirs along the canal course. Provision was made for purchase of dredging, pumping and other machinery and equipment, including installation of advanced water measurement and water management appliances. The result of the programme was supposed to be the creation of an insurance fund of water resources and the obtaining of additional volumes of water for expanding irrigated lands. For this purpose, provision had been made for purchasing and installing water-saving machinery and irrigation equipment. The state budget was the source of financing. Provisions had been made for the following expenses:

Table 3. Required financial resources for programme implementation.

Indicators	Preliminary cost, mln. manat
Construction of water facilities	357,00
Construction and reconstruction of pumping stations	434,60
Installation of water measuring equipment and data collection	16,62
Purchase of equipment	603,04
Summary:	1 411,26

The preliminary estimated cost of the programme is 1 411.26 mln. manats (403.2 mln. USD). Consequently, all these state budget expenses are included in the structure of expenditures on the rational use of natural resources. The programme provided long-term capital investments, and therefore provision of financing is transferred and included further into new programs, as for instance in the Program of of Turkmenistan on the social and economic development for the period of 2019-2025. At present, investments on the Karakum river are stipulated in the new Program of the President of Turkmenistan on the socio-economic development of the country in 2022-2028 and there are included also unused and additional funds for capacity expansion in 2017-2025 at the amount of 187 770,0 mln manats (about 53 496 mln. US dollars).

On the International Conference "Water for sustainable development" held at the high level in Dushanbe, the Republic of Tajikistan on June 20, 2018, the esteemed President of Turkmenistan emphasized that more than half a billion USD from the budget is spent annually to support development of environment, various ecological and water projects.[13] It may be said that government-sponsored programmes in the sphere of the water sector hold a major place in social and economic transformations and, consequently, the expenses for water resources, among the expenses specified, amount to a significant share of the state budget within the pattern of expenses for environmental protection and rational use of natural resources.

Share of the agricultural products within the GDP tend to increase. In 2019, the share of the agricultural sector amounted to 11.5% within the GDP, and according to the results of 2020, it reached 11.8%. This trend can be seen in the numbers indicated in Table 4.

Table 4.[14]

Indicator	2015	2016	2017	2018	2019	2020
Agricultural products in current prices, mln manat	11 661	13 327	14 758	15 754	17 116	18 359
Equivalent in USD, mil. dollars	3 322,2	3 796,9	4 204,6	4 488,3	4876,4	5 230,4

It should seem that increase of production of the agricultural products shall be a consequence of water consumption for irrigation of agricultural crops, but the available information demonstrates decrease of water intake for irrigation and agricultural water supply in 2020 in comparison with 2019. In 2019, 16 353.8 mln. m^3 of surface water was consumed for the

[13] Gurbanguly Berdimuhamedov – Towards new heights of progress// Selected works., Vol.12, Ashgabat, State publishing service of Turkmenistan, 2019, p.379

[14] Statistical Yearbook of Turkmenistan, 2020 y, State Committee on Statistic of Turkmenistan, Ashgabat,2021, p.21.

above said needs, and in 2020 the amount of consumed water decreased to 16 119.6 mln m^3 and amounted to 98.6% in comparison with the previous year. Observations also show decrease of water loss in comparison with the previous year. Water intake losses in 2020 amounted to 86.7% and inter-farm losses amounted to 88.6% in comparison with the previous year.[15]

This positive dynamics can be assessed as the results of reforms implemented in the country to introduce water-saving technologies for the rational use of water resources. Extensive use of water-saving technologies has become possible due to intensive development of entrepreneurship and engagement of the private sector in production of agricultural products, creation of incentives and benefits for those interested in farming, and to provision of soft loans, which allow introducing innovations and best practices into use of water resources, such as drip irrigation, sprinkling irrigation and other technologies.

In accordance with the program of the President of Turkmenistan on social and economic development of the country for the period of 2019-2025, investments from the state budget were also provided for the use of water-saving technologies in the production of agricultural products. Plans for the introduction of rational water consumption include the construction of hydraulic structures in each velayat (region), allowing the use of sprinkling irrigation on 600 hectares.[16]

According to the Programme of the President of Turkmenistan on social and economic development of the country for the period of 2019-2025, state budget expenditures are also provided for in the water sector of the country and are funded in accordance with the approved budget means. The programs may cover financing of one of the water arteries, for instance the «Program on the rational use of water resources of Turkmenistan and increasing the throughput of the Karakum river in 2015-2020», or large investments in the water sector of the country from the state budget can be provided in the main programs for the entire water industry. Such program is the program of the President of Turkmenistan on socio-economic development of the country for 2019-2025. Presently, the strategic document that has integrated all public funds from all existing provided for the water sector is a new Program of the President of Turkmenistan on socio-economic development for 2022-2028. The estimated data show that over a six-year implementation period of the program in the water sector, the state budget provides of more than 13 billion 820 mln. manats of financing for the development and enhancement of the water infrastructure. This is more than 3 billion 900 mln. US dollars.

The program provided for long-term capital investments and therefore the provided funding is transferred further to new programs, such as the inclusion and continuation of investment under the Program of the President of Turkmenistan for the socio-economic development of the country for 2019-2025.

Most of the financial means for the water sector have been allocated for the construction and reconstruction of reservoirs - over 4 billion manats (over 1 bil.300 mln. US dollars). The large financial allocation of means for the construction and reconstruction of reservoirs is explained by the scarcity of water and by becoming a strategic goal of the country in establishing an insurance water reserve for the national economy. Among planned construction objects are

[15] Environmental protection and use of natural resources of Turkmenistan in 2020. /Statistical compendium, Ashgabat, 2021, p.35

[16] Gurbanguly Berdimuhamedov – Towards new heights of progress// Selected works., Vol.12, Ashgabat, State publishing service of Turkmenistan, 2019, p.76

also reservoirs for collecting mudflows and overflow waters. This evidences that in order to create an insurance water reserve in Turkmenistan, each source of replenishment of the insurance reserve is given great importance and work is underway to use them for national economic purposes.

Restoring soil fertility and protecting it from secondary salinization is one of the urgent tasks of Turkmen water specialists. With the commissioning of the Turkmen lake "Altyn Asyr", collectors diverting drainage water from the developed territories were connected into a single network. As a result, the discharge of drainage waters into the adjacent streams and lowlands of the Karakum Desert is prevented, the reclamation state of the lands is improved, and the ecological situation is improved. Giving an importance to the implementation of this project, large financial resources are allocated for its implementation. Thus, for the period from 2000 to 2035, more than 4.9 billion manats (the equivalent of more than 1.4 billion US dollars) were allocated for the implementation of the Altyn Asyr Turkmen Lake project.

Significant funds of the program are provided for financing the construction and reconstruction of hydraulic structures on the country's waterways. For these purposes, more than 1 billion 700 million manats (the equivalent of more than 500 million US dollars) of state funds are excelled. Hydroconstructions are an important element of the uninterrupted functioning of the national economic complex, which allows timely and in the required volumes to provide water supply and redistribute water to the required areas. Therefore, much attention is paid to their well-coordinated functioning and significant funds are allocated in this regard.

Among the funding priorities are also such expenditure items as:

• Improving the carrying capacity of irrigation canals and drainage networks. For these purposes, the budget of the President's Program provides for more than 1 billion 100 million manats or more than 300 million US dollars in dollar equivalent;

• Improvement of the ameliorative state of lands (more than 840 million manats or more than 240 million US dollars) as well as other costs.

It can be noted that large investments are directed to increase the throughput capacity, modernization of the country’s irrigation and drainage systems (canals, irrigation and drainage networks, which include pumping stations, hydraulic structures, etc.). This is caused by the fact that many of them were built many decades ago, and some of which are worn out now, silted up, completely obsolete, are of low efficiency with significant filtration losses of water. It is necessary to modernize irrigation and drainage infrastructure, modernize many facilities and equipment for regulating, distributing, measuring and extracting water (including pumping stations). According to the program documents, in geneal, by 2030 it is necessary to increase the efficiency of the irrigation network to 0.75, namely by years:

2006	2010	2015	2020	2025	2030
0,58	0,62	0,65	0,68	0,72	0,75

Accordingly, funding, mainly the state-supported, is also channeled into these activities.

State financing of the water sector is based on large-scale investments in major projects on the basis of adopted programmes, which include the construction of irrigation structures, reservoirs, expansion of canal capacity, as well as machinery and technical equipment, and other required costs. At the same time, earthmoving equipment (bulldozers, excavators, dredgers, pumps, etc.) from foreign companies is purchased in large quantities; such equipment is used to

keep up the operational maintenance of water management facilities. Therefore, the most part of the annual expenses of the State Committee covers capital investments in fixed assets. For example, by the end of 2020, the total amount of capital investments in fixed assets was 316 951.5 thousand manats (the equivalent of 90 299.6 USD), of which 256 673.2 thousand manats (equivalent of 73 126.3 USD) are the expenses for industrial purpose facilities.[17]

At the same time, the operational costs to maintain the country's water infrastructure are annually financed from the state budget, and government regulations stipulate provision of major crops with irrigation water. A large proportion of the budgeting funds allocated for the water sector is spent on electricity and fuel. As with water use limits for water consumers (in the agricultural sector), generally, a monthly limit on electricity or fuel consumption is also usually set for pumping stations. In practice, however, some regions have excessive electricity (fuel) consumption and some regions have electricity shortages. The pumping stock is approximately 3.3 thousand pumps of different capacities. In some zones with mechanical irrigation, high costs for energy consumption reduce water availability for agricultural activities, which has a significant impact on agricultural production on irrigated lands, including harvesting of food crops. High-energy intensity and high operating costs also arise from wide geographical spread of the irrigated areas. Costs are also affected by depreciation and ageing of the pumping equipment stock, which loses its original capacity and consumes more energy/fuel, thus increasing repair and maintenance costs. As a result, the gained profit is reduced. Therefore, part of the budgetary funds provided for by the Program of the President of Turkmenistan on the socio-economic development of the country for the period 2022-2028 in the amount of more than 42 million manats or more than 12 million US dollars are allocated for operation and renovation of pumping stations.

The above said could be largely attributed to the dredgers available in the water management organizations (there are electric and diesel dredgers on the balance sheet). At the same time, the use of these dredgers is very important for maintaining large river channels, water intakes, and irrigation and drainage canals in serviceable condition. The state procurement of these expensive hydraulic engineering devices is also undertaken periodically, usually by government decrees on a one-off basis over a period of several years.

Despite the annual financing of operational costs of the country's water sector, including staff salaries, cost of fuel for operation of machinery (pumps, dredgers, earth movers, etc.), fuel for operation of production facilities, energy costs for utilities (heating, telephone services, etc.), raw materials and other operational costs, the funds received are not sufficient to organize the productive activity of the sector. As a result, the performance of water management organizations in implementing the plans and providing services is far from the expected level. Given the insignificant operating budget of the water management organizations, it is not possible to maintain the technical condition and carry out basic maintenance of equipment and water bodies on a regular basis. Only ad hoc maintenance works are carried out. As a result, mechanisms and machinery wear out quickly and the level of availability of water facilities decreases.

[17] Main indicators of investments in capital funds and commissioning of new facilities ministry-wise and department-wise in 2020.//The State Statistical Committee of Turkmenistan, Statistical book, Ashgabat, 2021, p.8.

However, now, the state budget is the main (almost the only) source of financing and the receipts from agricultural producers (the dominant water users) cannot currently act as a sufficient and reliable source of financing. However, they can be seen as a promising source of financial receipts for operation and maintenance of the irrigation system.

In Turkmenistan, in accordance with the priorities of agricultural development, state benefits are granted to rural producers. Rural producers have been granted benefits for minimum payment for use of land and water for agricultural purposes, and are exempted from taxes. The government has assumed the costs associated with construction of irrigation and land-reclamation facilities, irrigation and water supply. Minimum payments for land use and deductions from the created gross product only partially cover the state's costs for irrigation and reclamation activities. Tariffs for irrigation water, which were mainly preferential to support farmers, changed several times over the years of Independence. Today, farmers-water users growing crops under a State Order pay 30% of the water supply services, while the rest of the costs are covered by the State water management organizations represented by district and region water production associations, construction and other subdivisions of the State Committee of Water Management. The full cost of cotton cultivation per 1 ha, according to the tariffs approved by the Chairman of the State Committee on Water Management in 2019 was 181 manats. Expenses include payment for water supplied for washing, pre-sowing and 3 vegetation irrigations during the cotton season in the total volume of 7000 m^3 (this is the total irrigation norm for cotton limited by the state authorities).

According to the tariffs approved earlier by the Minister of Agriculture and Water Resources in 2018, cost of the second basic crop of winter wheat was 137 manats. These are payments for the supplied water for washing, pre-sowing and three vegetative irrigations per season totaling 5300 m^3 (this is the total irrigation rate for winter wheat limited by government agencies).

An important area of water consumption in the country is the social sphere. Following its international commitments to achieve SDG 6, Turkmenistan is making significant efforts to provide the population with clean drinking water, where the main costs are also provided for from the state budget. Budget funds are planned in accordance with the approved programs of socio-economic development, and then annual funding is carried out according to the planned scope of work.

Financing of water supply and drainage from settlements is provided for in the new Program of the President of Turkmenistan to improve the social and living conditions of the population of villages, towns, cities in etraps, etrap centers for the period 2022-2028. In accordance with the adopted program for the creation of engineering networks for various purposes, the cost of building networks for water supply and sanitation takes a significant place. Thus, 25% of the funds of this field are provided for the construction of water supply networks, 18% for the construction of water treatment facilities, 8% for the construction of sewer networks, and 5% for the construction of wastewater treatment facilities of all costs for engineering structures.

In financial terms, it amounts to quite significant figures. For the period 2022-2028, more than 1 billion 500 million manats (equivalent to more than 400 million US dollars) are planned for the construction and reconstruction of water supply networks, more than 1 billion 100 million

manats (equivalent to more than 300 million dollars) are planned for the construction and reconstruction of water treatment facilities, more than 500 million manats (equivalent to more than 140 million US dollars) are planned for the construction and reconstruction of sewer networks, more than 290 million manats (equivalent to more than 82 million US dollars) are planned for the construction of wastewater treatment plants.

Certain progress can be underscored in matters related to accounting and payment for the use of natural resources in improvement of tariffs and pricing in the field of providing the population with drinking water.

There was a change in the system of providing the population with drinking water with the introduction of a new pattern of payment for the volume of water consumed, as compared to the previously practically free use of water. In accordance with the Decree of the President of Turkmenistan "On streamlining payments for electricity, gas and utilities for citizens of Turkmenistan" of September 25, 2018, free provision of the population, including with water, is ceased. The schedule rate for 1 m^3 of drinking water is 0.5 manat. At the exchange rate of $1:3.5 manats, established by the Central Bank of Turkmenistan, the equivalent in dollars is 14 cents.

It should be noted that the introduced tariffs cover mainly the population provided with a water supply network, which can be equipped with the water metering equipment. According to the State Statistics Committee of Turkmenistan, 46.8% of the country's population lives in urban areas and 53.2%[18] in rural areas. Taking into account that urban settlements are mostly covered by a water supply network and partially a water supply network is available in rural areas, it can be estimated that the water metering equipment is installed in approximately 65-70% of households in the country.

As a result, significant results have been achieved in the rational use of drinking water over the past few years (Table 5).

Table 5[19]Dynamics of water supply to the population from 2017 to 2020

Indicator	2017	2018	2019	2020
Total water release, mln m^3	415,7	312,5	156,1	152,8

As can be seen from the above data, the introduction of tariffication and water metering in household water use created the preconditions for rational water consumption and increased the efficiency of measures for accounting and measuring water resources in the country.

iii. Analysis of sectoral and sub-sectoral financial priorities of the country and identification of problems/issues in the financing of the water sector.

The water sector of the country is developing under the adopted development programs, which generally contribute to real water savings, rational use of water resources, and elimination of the arising causes of losses. All plans fulfilled in the water industry allow addressing the problem of water shortage, supplying sectors of the economy with water and laying the basis for

[18] Statistical Yearbook of Turkmenistan, 2020 y, State Committee on Statistic of Turkmenistan, Ashgabat,2021, p.18,

[19] Statistical Yearbook of Turkmenistan, 2020 y, State Committee on Statistic of Turkmenistan, Ashgabat,2021, p.219.

sustainable development. However, current problems in the water sector cannot be dealt with at once in all its branches, and the process takes on a long-term character. Therefore, the mobilization of resources and investing in the water management facilities determine the financial priorities with regard to the function of a certain facility in the water supply system.

An analysis of financial priorities can be conducted in virtue of the adopted, implemented and ongoing state programs for financing the water sector of the country. The most important of these are:

1. Program of the President of Turkmenistan on Socio-Economic Development of the Country for 2022-2028;
2. Program of the President of Turkmenistan on the improvement of the social and living conditions of the population of villages, towns, cities in etraps, etrap centers for the period 2022-2028;
3. Program of the President of Turkmenistan on Socio-Economic Development of the Country for 2019-2025;
4. Program on the Rational Use of Water Resources of Turkmenistan and Increasing the Throughput capacity of the Karakum River for 2015-2020;
5. General Program on Supplying Settlements of the Country with Pure Drinking Water.
6. Program on the development of networks of facilities for the water supply and sewerage in Ashgabat for the period up to 2050.

The main priorities for financing the water sector are provided for in the Program of the President of Turkmenistan for the socio-economic development of the country for 2022-2028. In terms of duration, it is a medium-term program and provides for large-scale tasks. As already noted, for the period of the program, more than 13 billion 821 million manats of financial resources are provided for the development and strengthening of water management infrastructure for the water sector. This is approximately more than 3 billion 900 million US dollars.

The grouping of facilities according to common characteristics and the calculated data allow presenting the hierarchy of financial priorities, as shown in the Table 6.

Table 6 Funding priorities of the water sector objects for the period of 2022-2028

Grouping of indicators	Power, long	Cost, thous. Manat	Equivalent in, thous. USD
Expansion, reconstruction, construction of reservoirs, million m3	About 10 355	about 5 000 000	over $1 300 000
Construction, reconstruction, repair of hydraulic structures		over 1 700 000	over 500 000
Increasing the capacity of irrigation canals and drainage networks.	-	Over 1 130 000	Over $322 000

Land reclamation improvement, ha	233400	over 844 000	over $240 000
Increasing the capacity of the Karakum River		over 187 000	Over $187 000
Bank protection works	-	over 166 000	Over $33000

As can be seen from the above calculated data, compiled on the basis of the Program of the President of Turkmenistan for the socio-economic development of the country for 2022-2028, priority in financing water infrastructure is given to the creation of an insurance water reserve - the construction and reconstruction of reservoirs. Among them, such as the construction of a new pit (Zeyit) with a volume of 4,000 million cubic meters of the reservoir "15 Years of Independence" at the initial section of the Karakum River, the construction of the second stage with a volume of 1.65 billion cubic meters of the reservoir "15 Years of Independence", restoration of the capacity of the Saryyazinsky reservoir and others. This is due to the strategic objectives of uninterrupted water supply for the production, economic and agricultural needs of the country.

The same circumstances necessitate the construction of new and reconstruction of existing hydraulic structures, the task of fulfilling which is the second most important funding priority.

Among the priorities, one can single out an increase in the throughput capacity of canals and drainage networks. And this is no coincidence. The main part of the country's irrigation system (canals, irrigation networks, hydraulic structures, etc.) was built many decades ago, is physically and morally obsolete, is characterized by low efficiency, significant water losses during transportation through the systems of main, inter-farm and on-farm irrigation networks. For example, despite the decrease in off-farm losses in 2020 compared to 2019, a large amount of water resources is lost in off-farm networks - 5805.2 million m^3. At the same time, a certain part of water losses occurs due to organizational reasons, in particular, due to uncoordinated management, water leaks from switchboard devices and water supply structures. Therefore, the need for modernization of irrigation infrastructure, irrigation canals, renovation of many facilities and equipment remains high. In addition, timely water supply through irrigation canals plays an important role in crop maturation, avoiding losses, as well as in replenishing the insurance water supply in reservoirs. Silting processes are also observed in drainage networks. Currently, in order to replenish the watercourses to the Turkmen lake "Altyn Asyr", timely cleaning of drainage networks is necessary. The well-coordinated functioning of drainage networks and the timely removal of used water will help maintain land productivity and reduce the processes of salinization. At the same time, irrigation and drainage networks are a wide branched network throughout the country. Their cleaning, increasing the throughput requires great organizational efforts and financial costs.

Of course, heavy capital investments are made in land improvement activities. Soil salinization poses a serious threat in Turkmenistan. About 1 million hectares of irrigated land are salinized to a variable extent. Production associations and departments of the water Industry are made responsible in this respect, and the land reclamation systems of the country are on their balance sheet. In total, the length of the collector-drainage systems in Turkmenistan is approximately 39 thousand km. At the same time, the situation with regard to open collectors can be considered satisfactory. The cost of land reclamation work can vary to a wide extent, since the

watercourse silting degree is different even for the same type of drainage canals. Therefore, a high level of funding for these works persists.

Considering the financial priorities of the Program for the rational use of water resources of Turkmenistan and increasing the throughput capacity of the Karakum River for 2015-2020 , it can be noted that most of it provided for the purchase of equipment (603.04 million manats) and the construction and reconstruction of pumping facilities - (434.6 million manats). This is due to the needs for the Karakum River along the entire channel, which is 1100 km. It also undergoes siltation processes and maintaining sufficient capacity is essential for the agricultural, industrial and social needs of the country. Therefore, the purchase of equipment and the maintenance of pumping stations in working order is a priority to ensure sufficient water flow along the Karakum River and under the new Program of the President of Turkmenistan for the socio-economic development of the country for 2022-2028.

Another priority of no less importance in the country is the complete provision of the population with pure, high-quality drinking water that meets international standards under the "General Program on Supplying Settlements of the Country with Pure Drinking Water". Capital investments for the implementation of measures amounted to 17491.32 million manats. ($4997.5 million). Also in this aspect, one can indicate the large-scale "Program for the development of networks and facilities for water supply and sewerage in Ashgabat for the period up to 2050".

The strategic objectives of Turkmenistan in development of the country's water industry include important issues such as rational water use, the widespread introduction of water-saving irrigation technologies in agricultural production, and the attraction of private and international investments. Following the general line of socio-economic development and effective management of natural resources, some private agricultural producers, farms and farmers' associations have brought into use their internal funds to introduce the sprinkler irrigation method. Thus, according to the data provided by the Ministry of Agriculture and Water Resources of Turkmenistan, as of October 2018, sprinkler installations were introduced from the own internal funds of private agricultural producers, farms and farmers' associations over an area of 2657 hectares, and covered the cropped areas of 2482 hectares, including 1910 ha of wheat, 165 ha of alfalfa, 157 ha of cotton, 150 ha of corn and 100 ha of barley sown fields.[20]

According to information kindly provided by the American Company Lindsay, which has a representative office in Ashgabat, the introduction of sprinkler systems by private agricultural producers farms and farmers' associations began even earlier. Thus, according to their information, the campaign sold sprinkler systems to the amount of 2,790.000 US dollars over the period from 2013 to 2017 and to the sum of 720.000 US dollars in 2001-2002. The sprinkler systems sold cover an area of 1974 ha.[21]

Consistently carrying out reforms to encourage entrepreneurial activity in agriculture and introduce water-saving technologies, Turkmenistan provides preferential bank loans to agricultural producers for a period of 10 years. Loans are allotted at 1% per annum for the purchase of agricultural machinery, mechanisms and tools used for watering pipes, as well as excavators and bulldozers.

Along with industrial and economic relations, the legal framework is also being reformed, expanding the possibilities for attracting private investment in the development of water infrastructure. The following forms are envisaged as the provision of water infrastructure

[20] See att.2

[21] See att.1

facilities for rent, privatization and public-private partnership in their joint operation. In lease relations, the lease of small artificial or natural reservoirs by private entrepreneurs for the development of fisheries has been developed. Providing reservoirs for use by private households allows us to maintain the reservoir from overgrowing and waterlogging. Including as well non-state structures involved in the breeding / rearing of young fish, which are then brought into canals to eat aquatic vegetation. As a result, the reservoir is cleaned and fish production is increased. At the same time, small reservoirs are used for recreational purposes such as places of rest or public beaches. For the same purposes, plots and the coast of large reservoirs began to be leased for the development of fisheries and recreation. This allows attracting funds from entrepreneurs for bank protection works, as well as cleaning reservoirs from silting and overgrowing with vegetation. Assessing the participation of the private sector in the operation and use of water infrastructure facilities, it can be noted that the first stage of their involvement will be leasing relations and public-private partnerships, after which privatization will develop.

The reforms carried out in the country have contributed to the involvement of the private sector and entrepreneurs in the production of agricultural products. In accordance with the resolution of the Halk Maslakhaty in September 2018, a special land fund was created, from which, based on the decision of the working commission, land is allocated to those who wish to produce on it in accordance with the Land Code for a period of 99 years. These transformations stirred up the business sector, which began to actively invest in agricultural production and especially in water-saving technologies, as the guarantee of their contribution increased.

The main goals and amounts of investments of entrepreneurs are also provided for in the Program of the President of Turkmenistan for the socio-economic development of the country for 2022-2028. Entrepreneurs will make large investments in expanding the use of water-saving technologies for irrigating lands. Thus, in the production of agricultural products on an area of more than 25,720 hectares, entrepreneurs plan to invest in the use of water-saving technologies of more than 2 billion 170 million manats, which is equivalent to more than 618 million US dollars. This underlines the support of the state in the further development of agricultural production for the rational use of water resources and the effectiveness of ongoing reforms to attract private investment in agriculture and water management. There are also constraining factors in expanding the attraction of private sector investments and the inflow of innovative technologies into the water sector, which are associated with the interbank mutual settlements of countries and bank conversion for the purchase of necessary equipment, raw materials and materials. The bank conversion process for the execution of supply contracts is sometimes delayed, limited in amounts, which hinders the timely implementation and launch of facilities, the introduction of improved technical developments and equipment. The resolution of these issues would allow entrepreneurs to expand investments in the development of the country's water sector and to introduce innovative technologies in the functioning of water infrastructure facilities.

Section 2. Review of legal, institutional and managerial terms of financing of the water sector

i. Review of the existing key water policies and legal instruments available to support the water sector financing.

Reforms of the agricultural sector have been accompanied by improvement of legal basis of the water sector. Adoption of a number of laws (namely, Water Code (2016), Land Code (2004), Law on land reclamation (2018), Law on environmental protection (2014), Law on potable water (2010), Law on government support of small and medium business (2009) etc.) is significant progress in improvement of legal and institutional basis of management of the water reserves of the country. All of this become a result of the successively implemented policy of the President of Turkmenistan and strategic programmes adopted in the country. For example, adoption of the National Strategy of Turkmenistan on Climate Change (2012) reflecting the measures for improvement of the effectiveness and sustainable use of water reserves (announced by the President of Turkmenistan before Rio+20 Summit in 2012) and the revision thereof in 2019, joining of Turkmenistan to the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (the Water Convention) in 2012, the Ramsar Convention and Aarhus Convention promote not only to alignment of the aspects of management of water resources of the country with the international norms and standards, but also played a significant role for formulation of positive measures in improvement and development of the water economy of Turkmenistan, which were applied in national strategic investment programmes, departmental plans and projects.

Strategic plans for development of the water sector of the country are fixed in government programmes involving sectorial and sub-sectorial financing:

- The national programme of the President of Turkmenistan for reorganization of the social and living conditions of people living in rural areas, villages, cities of districts and district administrative centers for the period to 2020 (the programme was extended);
- General programme for provision of residential places of the country with clean potable water;
- Programme for the rational use of the water reserves of Turkmenistan and increase of the throughput capability of Karakum River. (2015-2020);
- Programme for development of the agricultural complex of Turkmenistan for the period of 2019-2025;
- Programme of the President of Turkmenistan for social and economic development of the country for the period of 2019-2025;
- Programme for development of the agricultural sector of Turkmenistan for the period of 2012 - 2016 and activity plan of implementation therefor.
- National Strategy of Turkmenistan on Climate Change (new revision), 2019:
- Programme for development of the Avaza National Tourist Zone at the coast of the Caspian Sea;
- Joining of Turkmenistan, including financing, to implementation of ASBP-3 and ASBP-4.

A solid legal base has been created in the water sector. The Water Code of Turkmenistan (2016) regulates relations in the field of sustainable and rational use of water for purposes of

meeting the water needs of legal and physical entities and is intended for increasing the significance of water resources and protection thereof. Also, the normative base of financing of the water economy includes the Law on potable water (2010), the Law on government support of small and medium business (2009), etc.

An illustrative example is transition from the previous charge-free water supply of agricultural producers toward the chargeable one. In the recent years, the rates for use of irrigation waters are established annually by the Resolution of the Cabinet of Ministers of Turkmenistan with regard to each agricultural crop. The Resolution stipulates application of hectare-wise rates for water supply with consideration for water demand of different agricultural crops (see previous section).

Various resources, namely material, financial, etc., are required for full-scale implementation of water management activities and the functioning of the water infrastructure. In this regard, there are many disputes and uncertainties around the problem of participation of private business, privatization of facilities/systems in the water sector. However, it can be argued that, in general, water, being the subject of national wealth and ensuring food and national security, cannot be transferred to the private sector. Regarding the involvement of the private sector in the country, the following can be indicated - it is possible only in the production of certain services for the water sector under the state control. Involving companies and investments to improve the level of the water protection system, the creation and development of water infrastructure, water conservation, and the involvement of waste water in reuse shall be encouraged. The experience of managers in private business will help in the efficient water conservation. In this regard, great progress has been made in the new Water Code of Turkmenistan (2016), the Law on Drinking Water and other water-related legislative acts. Thus, several articles have been introduced into the Water Code, allowing the transfer of on-farm facilities and water systems (objects of artificial origin) into possession and use, or into ownership. Objects of natural origin may only be transferred for use (their privatization and purchase-sale are prohibited). This shall be carried out on the basis of the state-private partnership which has a legal framework. The legal basis for public-private partnership in Turkmenistan was created by the Law of Turkmenistan “On Public-Private Partnership”, which entered into force on June 8, 2021. The law provides a system of incentives and benefits for businesses to participate in state programs and infrastructure projects. When developing a public-private partnership project, Turkmen entrepreneurs are provided with various types of financial and logistical support, including in the form of subsidies, investments of assets and property, payment for products, works and services that are important for the implementation of the project, as well as the transfer of state property into possession and use for the term of the agreement. The law grants the right to initiate public-private partnership projects to the representatives of the private sector themselves. This is an opportunity to attract private initiatives and investments in the development of water infrastructure through their use as a public-private partnership.

Water legislation provides for economic measures to regulate water use, differentiated tariff rates for water supply services, benefits for the introduction of water-saving technologies (Articles 110, 111). So, tariff rates for water supply services can be set for different categories of water users, taking into account the following criteria:

- government costs for water supply;
- quality of supplied water;
- timeliness of water supply;
- use of irrigation and drainage system;
- territories to which water resources are supplied, and other criteria.

Legal rules of economic regulation of use and protection of waters, according to which a financing opportunity appears, are stipulated in article 110 of the Water Code of Turkmenistan. Subject to the provisions of this articles, one of the main types of economic regulation are supply of water to consumers on a paid basis and wastewater disposal, including performance of repairing and restoration works and other water management activities. Article 111 of the Water Code stipulates paid-up basis of special water use in Turkmenistan (excluding separate cases of water use established by the Cabinet of Ministers of Turkmenistan). At the same time, the rates for water supply services to water consumers are set by an authorized agency (currently the State Committee) in coordination with an authorized state administration agency in the field of finance and economy. They are established on the basis of the standard volume of water, the actual costs of supplying water to water users and other criteria.

Also, Article 59 "Inter-economy and intra-economy hydraulic structures" stipulates the legal instruments to support financing. Subject to paragraph 5, state water management organizations responsible for the provision of irrigation water may, under contracts with peasant household associations, water consumer associations, water consumer groups and other water consumers, carry out work on a fee basis for purification, repair and operation of the intra-economy irrigation and collector-drainage network and hydraulic structures and technical devices thereof. A separate paragraph states that the procedure and conditions for payment for cleaning, repair and operation of intra-economy irrigation and collector-drainage network (CDN) and hydraulic structures and technical devices thereof are determined in accordance with the legislation of Turkmenistan. It is worth noting that according to the legislation, intra-economy irrigation and CDN and hydraulic and other structures thereof are registered on the balance sheet of water consumers. Maintenance in working order of the intra-economy irrigation and collector-drainage network and hydraulic structures, technical, pumping and other devices thereof is laid upon them. Expenses (rates of) for maintenance in working order of the intra-economy irrigation and collector-drainage network and hydraulic structures and technical devices thereof for irrigation of agricultural crops within the government order, are established by the Cabinet of Ministers of Turkmenistan. Rates of maintenance in working order of the intra-economy irrigation and CDN and hydraulic structures and technical devices thereof for irrigation of agricultural crops, not included into the government order, are established by an authorized agency in accordance with the applicable legislation of Turkmenistan (currently the State Committee of Water Management).

At the same time, the Water Code of Turkmenistan provides for engagement of citizens/communities into management of the water reserves, namely by creations of associations/groups of water consumers. In accordance with the Law on potable water (2010) the possibility of broad participation of business structures in the municipal sector can be considered a particularly great achievement. As is well known, there are problems with water losses, with ensuring the quality of potable water, with material and financial resources for construction and operation of the infrastructure of Water and Sanitation Authority.

Until recent time, no operating mechanisms have been available for population to participate in the decision process for water issues, protection of water resources in general, and water supply and sanitation in particular, notwithstanding that the country ratified the corresponding international conventions, which demand ensuring awareness and participation of the society in decision-making process (including Aarhus Convention). At the same time, it is worth noting that limited efforts in this regard were made within pilot projects implemented by some international and foreign organizations-donors. This problem is likely related to lack of understanding by state officials of significance of engagement of the population to such issues, on the one part, and lack of understanding by the population of significance of participation in these processes, on the other part. The main cause of absence of initiative of the population is their low awareness. At the same time, the Water Code recognizes public organizations and citizens as full-fledged members of water hydro-economic relations.

With regard to institutional instruments for implementation of financing of programme/project activities in the water sector, one can note the available strong relations with the agricultural sector. As it has been mentioned already, the majority of water investments is intended for support/development of the agricultural production and Water and Sanitation service in terms of improvement of provision with irrigation and potable water and land-reclamation condition of areas. For this reason, planning of these activities, including financing, is mainly made with participation of the Ministry of Agriculture and Environmental Protection of Turkmenistan and the State Committee, as well as the Ministry of Finance and Economy of Turkmenistan. Generally, in all previous years and to the present day, in terms of institutional instruments, the following system and mechanism/procedure, functional for many years, for performance by the State Committee of the measures for implementation of project in the water sector clearly demonstrates the peculiarity and strong interrelation/interaction of water management and agricultural sectors. The Client is the Central Directorate for construction of water facilities/structures, which is included into the Ministry of Agriculture and Environmental Protection of Turkmenistan. The Contractor is generally a sub-division of the State Committee. At the same time, to perform some specific works, such as mining, explosive, complex bridge erection works etc., organizations from other departments (Ministry of Emergency Situations, military, railway administration) can be engaged in as Subcontractors. After the Contractor (and Subcontractor) completes the next scheduled stage of works, corresponding certificates and forms are issued and filled in (including Form № 2 and Form № 3), which then are transferred through the channels for agreement/approval by the main client of a project under implementation. To sum up, the key role in the practical investment process (acceptance of completed scope of works and payment therefor) is performed by the Ministry of Agriculture and Environmental Protection of Turkmenistan represented by the mentioned construction directorate. Dayhanbank and the Ministry of Finance and Economy of Turkmenistan are among other participants as well.

Implementation of scheduled strategic tasks of the water economy is hindered by various difficulties of organizational, financing, institutional and technical nature, including the issues related to climate dangers, which complicate whole (integrated) performance of water supply issues. Moreover, the concepts of IWRM (Integrated Water Resource Managements) accommodating the interest of all involved parties and emphasizing necessity of provision with effective management institutions and basin approach, have not become widely used in the country.

ii. Understanding of legal, institutional, and organizational aspects of "best practices" in financing the water sector of Turkmenistan.

Procedural and institutional departments of the water sector are not independent enough; privatization and transition to market relations are exercised slowly. In the part of financing and investments, this sector is largely affiliated with the agricultural sector. The Central Directorate for construction of water facilities, within the Ministry of Agriculture and Environmental Protection of Turkmenistan, in the capacity of a general contractor can serve as a demonstration of the above said in organizational and legal, financial and institutional terms. Also, one might develop activities for broad participation of interested parties in management of water resources, i.e. expansion of engagement of the private sector (current conditions are insufficient). According to the results of the review made, one can draw conclusion that it is possible to achieve better results, provided that modern economic instruments and financial mechanisms (stimulation, sanctions, credits, tariffs, insurance) are implemented more extensively.

Events carried out by the departments of the water sector for decrease of inefficient water loss provide for full and timely performance of operational activities ensuring high technical condition of irrigation and collector-drainage network. Specifically:

- timely clearance of irrigation and collector-drainage network from siltation and weediness;
- maintaining high technical condition of water-regulating and water-conducting hydraulic structures;

It is critical to perform capital-intensive, technical activities intended for assured water supply and reduction of inefficient water loss. Such activities include:

- straightening and shortening of off-load parts of main and inter-economy canals, creation of optimal cross-section parameters;
- application of counter-filtration technologies (lining, clay alteration, etc.);
- modernization of canals and water structures;
- modernization of the existing and construction of new reservoirs to regulate and accumulate flood and winter runoff;
- reduction of the number of water-intake facilities, particularly pumping and siphon, by construction of additional control structures and merging canals;

The largest water loss occurs on irrigated fields due to low performance coefficient of the used watering devices. On the assumption of the final objective to secure enough amount of water, sectoral legal instruments stipulate that the main activities for increase of efficiency of irrigation and reduction of inefficient water loss shall be performed particularly at the intra-economy level. To provide high efficiency of irrigation devices, together with implementation of advanced irrigation methods - drip and sprinkling irrigation, the necessity arises for improvement of traditional irrigation method. Due to financing and other reasons, now and in foreseeable future, surface irrigation method will remain predominant in the country. In this regard, financing and activities (not on large scale yet) for improvement of the applicable traditional irrigation method are very important. Such activities include improvement of planning of the

surface of irrigated lands, reduction of specific length of the irrigation network, creation of optimal water-salt balance of soils (availability and ordinary operation of collector-drainage network). The mentioned activities also provide for construction of pipelines, tray network, and concreting and other counter-filtration works.

Difficulties with repairing of the water infrastructure at the intra-economy level is mainly related to the fact that intra-economy systems under the Water Code are registered on the balance sheet of water consumers, i.e. farm associations. In most cases, their financial standing and machinery stock cannot support water (and drainage) infrastructure at proper engineering level. Consequently, this explains the situation with construction of new hydraulic structures and watercourses on cropping farms.

Instructions, programmes, regulating and other statutory documents related to the water sector stipulate the necessity of development and implementation of economic mechanisms to support high technical conditions and reduction of inefficient water loss. Programme documents contain volumes and dates of implementation of advanced irrigation methods in the country regions - improvement of traditional, drip and sprinkling irrigation. In accordance with the developed programme, by the year 2030, advanced traditional irrigation method will be used on the area of 1128 thousand ha, drip irrigation - on the area of 260 thousand ha, and sprinkling irrigation - on the area of 219 thousand ha.

Due to escalation of water problems, the President of Turkmenistan established the Government commission for the issues of water supply (with approval of the composition thereof). The corresponding Resolution was signed in June 2022 at the Government Session. The mentioned commission was established "for the purpose of uninterrupted water supply of the sectors of economy of Turkmenistan, rational and efficient use of water resources, as well as for creation of water reserves". Later on, within this framework, in accordance with instructions of the President of Turkmenistan, a permanent Center for management of water resources was established

International institutional mechanisms for management of water resources (including financial issues), in which Turkmenistan is engaged in, include: ICWC, EC IFAS, ICSD, UN Regional Centre for Preventive Diplomacy for Central Asia (located in Ashgabat) and others. At the same time, Amu-Darya Basin Water Management Organization together with Dashoguz and Lebap production associations of the water economy of Turkmenistan and corresponding organizations of neighboring Central Asia countries are institutional structures of joint management of water resources and apportioning of water at cross-border Amu-Darya. It should be noted that within the framework of inter-state cooperation of the Central Asia countries for Aral Sea Basin Turkmenistan entered the ASBP-4, which stipulates modernization of the management system of water resources, improvement of land-reclamation condition of irrigated areas, recovery of hydro-economic facilities in the basin of Amu-Darya river, provision of stable water supply in rural areas of the Central Asia countries.

It is also worth noting that institutional structures for shared management (including financing issues), protection of water resources, and apportioning of water at Iran-Turkmenistan Reservoir Dam on Tejen river are the Joint Iran-Turkmenistan Administration, production association of Ahal region and corresponding Iran hydro-economic organization.

The accession of Turkmenistan to the UNECE Water Convention (2012) and even earlier to the Ramsar Convention, as well as the adoption of the National Strategy of Turkmenistan on Climate Change (2012) were a significant step in achieving the goals of water management,

ensuring the availability of water for various needs, in practical implementation of the agreed covenants. The country is taking measures to implement the SDG strategy, in which the water context occupies a significant place. Along with the progress on the international level, these actions gave impetus to many positive changes at the national level (including the revision/updating of water legislation, institutional advances towards international approaches and standards, including the creation of an interdepartmental commission for the implementation of international conventions by the country, etc.).

Section 3. Documenting and mapping of the government, private and international financing experience, and solutions for different level water infrastructure: online, main irrigation infrastructure

A bright example of shared use of water resources is Iran-Turkmenistan Reservoir Dam Dostluk at Tejen river. Works for construction of the dam began in 2000 following conclusion of the Agreement between Turkmenistan and the Islamic Republic of Iran on construction of reservoir dam Dostluk in 1999. In 2005, the official ceremony of commissioning of the dam was held. Storage capacity of the reservoir is 1,25 bln. m^3. The reservoir supports long-term control of the river runoff. The main objectives of the Project were improvement of water availability of irrigated lands in Iran (25000 ha) and Turkmenistan (25000 ha), provision with potable water of Iranian city Mashhad (150 mln. m^3 a year) and prevention of damage caused by flood. Turkmenistan and Iran attracted financial and material resources, construction-engineering personnel and technical stock of hydro-economic and energy sectors. Total cost of the construction works estimated at 183 mln USD (financing in equal portions). Operation of the dam is performed by joint Iranian-Turkmen Administration (together with corresponding staff from both countries). Joint operation of the facilities of facilities complex of reservoir dam Dostluk is performed on the basis of the Rules of joint operation of reservoir Dostluk on Tejen/Hari Rud river, approved by both countries, and provides for joint performance of all activities related to filling and operations, pass of flood discharge, running and major repairing, and taking other operating measures. Expenses for joint works for strengthening of dam, hydraulic architectures, reservoir, discharge waters and other expenses are covered by the countries in equal portions.

With financing in equal shares of the total construction cost of $183 million, it can be noted that the Turkmen side invested funds/resources from the state budget. In accordance with the decrees of the President, in addition to the production structures of the existed at that moment the Ministry of Water Resources of Turkmenistan, also other ministries and departments of Turkmenistan were involved in the construction works as per their profiles: roads, electricity, communications, explosives and others with their own funds.

During the implementation of the “Dostluk” Reservoir Project, additional tasks arose, which were solved on the basis of joint protocols. Usually, to solve technical issues of the water intake by each of the parties during the operation of large reservoir dams, a water distribution unit is needed in the downstream. As a result of the numerous consultations and negotiations was an adoption on August 18, 2007 of the “Agreement between the Government of Turkmenistan and the Government of the Islamic Republic of Iran on cooperation in the design, construction and operation of a joint water distribution unit on the river Tejen (Harirud) in the area of the “Shirdepe” settlement, on the basis of which, 26 km downstream from the “Dostluk” reservoir, the joint use of the Hydroelectric Complex was built and started. In this regard, in addition to the above “Rules for the joint operation of the “Dostluk” reservoir on the Tejen (Harirud) River”, the “Rules for the joint operation of the “Shirdepe” water distribution unit on the Tejen (Harirud) River” were adopted, in which there are relevant provisions regarding the principles of joint water use, operation, as well as sanitary release of the river “Tejen” in the downstream of the dam. To ensure the ecological systems in the downstream section, a sanitary-ecological release is provided, which should be carried out within 8 months of the 12^{th} part of 5% of the annual flow.

In accordance with the “Agreement on the construction and operation of the “Dostluk” reservoir dam”, all the water of the Tejen (Harirud) river at the site of the reservoir dam

(regulated and discharged) is divided into two equal shares (the volume of water not collected by one of the parties can be withdrawn in subsequent years).

At the "Shirdepe" hydroelectric complex, the volumes of water used by both parties and the volume of the ecological passage are measured, but the volume of water in the "Tejen" River from the "Dostluk" Dam, as well as the share in the water of the Mashhad city are measured at the "Dostluk" Dam. Also, in bilateral documents on joint operation, the following is allowed - after the occurrence of flood conditions at the "Dostluk" dam, the parties within 7 hours can take water from the riverbed as much as possible (this condition is observed at the "Shirdepe" water distribution unit for another 7 hours after completion flood conditions at the "Dostluk" dam). In a dry year when the water reserve in the reservoir cannot be increased by more than 300 million m3, the accumulated water reserve, by mutual agreement of the parties, is used up for consumption.

Regarding the water quality control: according to the agreements, the parties undertake to prevent the entry of pollutants into the upstream and downstream of the dam, including runoff containing residues of fertilizers, pesticides, and surfactants.

In addition, in order to create necessary conditions for construction / operation, the "Rules for the simplified crossing of the Turkmen-Iranian border at the site of the operation / use and repair of the "Dostluk" Reservoir in the border section of the "Tejen" (Herirud) River were developed and approved (ratified by the Agreement between the Governments).

The investment policy of Turkmenistan on development of agriculture, environmental protection and rational use of water resources is based on the attraction of funds from various sources. The principle of public-private partnership is widely applied in the country to finance the mentioned areas of activities. The programme of the President of Turkmenistan for social and economic development of the country for the period of 2019-2025 provides for an expansion of investments sources from non-public sector of the economy and the increase of foreign investment share. For that purpose, private enterprises began to be involved in investing the water sector. They introduce innovative solutions in the water sector development as well as reclaim distant lands with water supply using advanced technologies. As an example there is a water facility built by the joint-stock company of an open type (JSC) "Mive". The practice of the construction of irrigation facilities on the territories of their shareholders meets the international standards and complies with the principles of the rational use of water resources and environmental criteria. The JSC "Mive" is focused on fruit and other horticultural products. The shareholders are the following economic societies: "Gok Bulut", "Hemsayya", "Miveli Atyz", "Datly Mive". In accordance with the order of the President of Turkmenistan, each shareholder-economic society was granted a land plot of 300 ha for long-term use on the territory of daikhan (peasant household) association "Watan" of the in Kaahka etrap (district). The total land area allocated for production of vegetable, horticultural products and grapes is 1200 hectares. The expected annual productivity of the economy society "Gok Bulut" is estimated at 370 tons of nuts, 520 tons of apples, 120 tons of plums, 140 tons of peaches, 1500 tons of pears; ES "Hemsayya" plants to produce 180 tons of almonds and 2100 tons of persimmons; ES "Miveli Atyz" and "Datly Mive" have focused on production of almonds as well. The annual yield is expected to be 340 and 320 tons of almonds accordingly. To irrigate the given territory, the JSC "Mive" developed, constructed and commissioned a unique hydraulic structure using the best world practices.

At first, water under gravity flows to a station where high-duty pumping units. From the station water required for irrigation of farmlands is pumped to the 1st station by 6 water pumps of 400 kW each, installed at 630th km of Karakum River. Through water distribution system water runs to the 2nd water pumping station located at the distance of about 12 km and at the height of 61m, from there - to the 3rd station located at the distance of 10 km and at the height of 62 m. From the 3rd station water runs to the central water storage facility with the capacity of 70 thousand m^3 located at the height of 60 m and at the distance of more than 5.5 km. From this water storage facility water is further distributed through drip irrigation system to farmlands. Irrigation process of farmlands is automated and monitored through a digital system. Total length of the pipeline is about 27.5 km. The system created allows to produce crops at the height of 180 m above the level of Karakum River and save 35-50% of water.

This example shows the effectiveness of the policy implemented in Turkmenistan to engage the private sector into development of the agricultural sector and create system of benefits and incentives to develop entrepreneurship in the agricultural sector. Initiatives of such entrepreneurs help to save water.

Conclusions and recommendations

1) Notwithstanding that the agricultural sector of the country consumes the dominant share of the water resources, water use in the country is not performed at proper level that is conditioned by both poor infrastructure of irrigation systems (mainly canals) and ineffective machinery for irrigation / low quality irrigation. The most part of the irrigation system and water and sanitation service is extremely worn out, there are problems with water loss, provision with qualitative potable water, material and financial resources for construction and functioning of the water infrastructure. Degradation of irrigated lands aggravates water problems.

2) Provided that 95% of available water resources are supplied from cross-border sources and now the whole volume (years with average water availability) are fully consumed for the needs of utility and drinking water supply and economy of the country, further expansion of irrigated lands and development of the agricultural sector in general is possible by means of increase of efficiency of use and saving of available water resources. Development of market relations, creation of husbandry farms, change of forms of ownership and the composition of consumers demanded new approaches in improvement of the existing system of operating provision of the water economy, improvement of the whole package of services for consumers. To perform maintenance in such volume in full and in high quality manner is possible in case of development of the water infrastructure and corresponding investments for water saving and creation of water reserves, cleaning and transportation thereof, modernization of irrigation and utility equipment.

3) Water resources are important to the agricultural sector development and taking it into account the government has formulated the reforms on water resources management policies in conjunction with land and agro reforms. The state programs and documents have been adopted as well as reforms on agro and water sectors (including water canals) were implemented including activities/funding to assist in the improvement of water supply for consumers and to reduce water losses. Since the agricultural sector is a consumer of over 90% of water resources, it is important to coordinate the reforms/activities in the water sector together with the reforms in the agriculture field and land management.

4) Prioritizing investment opportunities for development of the water economy is mainly defined by the current situation in the irrigated agriculture of Turkmenistan. Irrigation and land-reclamation activities intended for improvements of the agricultural sectors are mainly financed by the government. Unless the options assuring land use and tangible benefits for a comparatively brief period are provided, farms and households, as well as other agricultural producers and communities are unlikely to apply them on a wide scale. Without earning capacity of farming and reliability of land ownership one cannot expect that they will be financing the water sector as required (and there will be no proper return from water investments). In the context reviewed, financing, other various binding constraints may be revealed, which are required overcome through change of policy or institutional changes, or otherwise (including the options of regulating approach, incentives, facilitating access to the best technologies, credits). If the options of sustainable management of the water (land) resources having promising economic potential are determined, this will expand opportunities of governments and other investors and allow to better distribute investments and activities. Taking interests of various water consumers into consideration to the fullest extent, including representative of the civil society and private sector (existing conditions are insufficient), will contribute to resolving the problem.

5) Improvement of statutory regulation of the activity of organizations structures in the water sector, including as it relates to financing, stipulates necessity of improvement of the national regulatory and statutory base for the activity of the State Committee in the water economy sector, including development and acceptance of by-laws.

6) Sustainable development of the water economy with regard to spreading of degradation processes and highly possible reduction of river runoffs due to climate changes requires access to advanced information resources and modern effective managerial methods and technologies. Global trends from the perspective of information and technological exchange, openness and possibility to use administrative, organizational, communication and various innovative achievements shall be developed on a wide scale and be used in the water sphere and water use sectors.

7) Increase of financial contributions to the water sector of the country shall promote to use of possibilities of small hydropower. The most reservoirs in the country are built as dams with fall of more than 7 meters. Water during discharge forms stream, energy of which according to modern engineering solution can be transferred to the nearest inhabited localities and industrial facilities. Small-scale turbines developed and used in the hydraulic power industry will allow transferring the energy of the water stream into electricity to sell to consumers, and to relieve load from the Central Heating and Power Plants.

8) There are possibilities to reduce electricity costs of used low-powered pumps and electric losses through the use of solar generators and supply thereof to pumping stations.

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Attachment 1

Use of water saving technology – Irrigation in the farms of Turkmenistan for 08.10.2018						
№	**Velayat**	**Location and name of the farm**	**Equipment brand (country)**	**Total area of employed technology, ha**	**What crops**	**Cultivation area, ha**
1	Akhal	Economy society "Dowletli gala" daykhan union (d/u) named after Sh.Batyrov, "Baharden" etrap	"Lindsay" (USA)	384	Wheat	384
		Economy society "Ajayip ussat", d/u named after Sh.Batyrov, "Baharden" etrap	"Valley" (USA)	350	Wheat	350
		Daikhan farm "Yukchi", d/u named after Sh.Batyrov, "Baharden" etrap	"Valley" (USA)	160	Wheat	160
		Livestock complex “Shaoly” (under the Ministry of Water and Agriculture), d/u "Bugdayli", "Ak bugday" etrap	"Lindsay" (USA)	300	Barley	100
					Alfalfa	100
					Corn	100
		Daikhan farm "Bugdayli", "Ak bugday" etrap	"Bauer" (Austria)	25	Wheat	25
		Daikhan farm "Watan", "Ak bugday" etrap, Experimental site of the Turkmen Agricultural University	"Valley" (USA)	25	Alfalfa	25
		Daikhan farm named after Niyazow, "Ak bugday" etrap	"Lindsay" (USA)	15	Wheat	15
		Daikhan farm "Gawers", "Ak bugday" etrap	"Atlas" (Turkey)	20	Alfalfa	20
		Economy society "Yigit", daikhan union "Dushak" , "Kaka" etrap	Equipment of the USA	350	Wheat	350
		Daikhan union named after Niyazow, "Sarahs" etrap	"Lindsay" (USA)	20	Alfalfa	20
	Total:			**1649**		**1649**

2	Balkan	Daikhan farm "Nurly meydan" , d/u "Turkmenistan", "Bereket" etrap	Equipment of the USA	50	Corn	50
		Daikhan farm "Yagmyrly meydan", d/u"Turkmenistan" "Bereket" etrap	Equipment of the USA	88	Wheat	88
	Total:			**138**		**138**
3	Dashoguz	Agricultural joint stock company, etrap named after Niyazow	"Lindsay" (USA)	50	cotton	50
			"Ikonym Dish.Tich.LTD.STI" (Turkey)	107	Cotton	107
			"Fayyaz" (Iran)	50	Wheat	50
			"Opal Pivot" (Turkey)	300	Wheat	185
		Daikhan union "Baydak", "Gubadag" etrap	"Valley" (USA)	115	Wheat	115
		Daikhan union named after B.Owezov, "Gorogly" etrap	"Valley" (USA)	74	Wheat	74
		Daikhan union "Ashyk Aydyng", "Ruhubelent" etrap	"Valley" (USA)	174	Wheat	114
	Total:			**870**		**695**
Grand total:				**2657**		**2482**

Attachment 2

Data on farms and areas with employed irrigation systems “Lindsay» in Turkmenistan

	Welayat	*Etrap*	*Brand*	*Q-ty*	*Ha*	*Apparatus radius*	*Farm*	*Cost per unit, $*	*Total cost, $*	*Year of implementation*
1	Akhal	Yashlyk	Lindsay	1	24	280	Daikhan farm “Daikhan”	70000,00	70000,00	2014
2	Дашогуз	-	-	1	50	400	Daikhan farm named after Sadulla Rozmetov	Gift	-	2015
3	Balkan	Serdar	-	1	50	400	Economy Society “Nurly meydan”	90000,00	90000,00	2016
4	Akhal	Bahardeн	-	8	400	400	Economy society “Hezzet”	90000,00	720000,00	2014
5	Akhal	Bahardeн	-	7	350	400	Economy society “Ajayyp ussat”	90000,00	630000,00	2016
6	Balkan	Serdar	-	2	100	400	Daikhan society “Guneshli meydan”	90000,00	180000,00	2013
7	Akhal	Sarakhs	-	8	400	400	Local municip-ty	90000,00	720000,00	2016
8	Akhal	Dushak	-	2	200	400	Plot of the “Awtoyollary” trust	140000,00	280000,00	2017
9	Akhal	Ak bugday	-	8	400	400	Daikhan farm “Bugdayly”	90000,00	720000,00	2001-2002
			Grand total	**38**	**1974**			**Total**	**3410000**	

Water Sector Financing in the Republic of Uzbekistan

By Firdavs Kabilov

Table of content

Abstract

This Report discusses legal, institutional and economic reforms in the water sector of Uzbekistan. This is done so with a particular focus of shedding light on the historic trends in funding the water sector at large and water infrastructure in particular and identifying emerging patterns of private sector participation in this regard. While the sector is, and likely to remain so for a foreseeable future, largely under State funding, opening the economy for a private sector from 2017 onwards has resulted in some developments in the water sector too. Adoption of the Public-Private Partnership Law and introducing relevant changes in the Water Law have yielded first water infrastructure development project funded through sophisticated project finance structure and implemented by a private sector entity. While this is a remarkable achievement towards sustainability debate in the water sector, much needs to be done on policy, technical capacity building and public relations fronts in order to upscale such efforts.

Key words: water, infrastructure, sustainability, PPPs, private sector, Uzbekistan

Section 1: Executive summary

The average annual volume of water resources used by Uzbekistan is 51-53 km3, of which 80% (about 41 km3/year) falls on transboundary rivers. Estimated natural resources of fresh and slightly brackish groundwater, extremely unevenly distributed throughout the country, potentially amount to 27.6 km3/year. The needs of water consumers are covered through the combined use of surface water (50.9 km3/year), operational groundwater reserves (0.5 km3/year) and reuse of collector and drainage waters (1.6 km3/year). On average, 90-91% of water resources are used in agriculture, 4.5% - in the field of public utilities, 1.4% - in industry, 1.2% - in fish farming, 0.5% - in thermal energy, 1% - in other sectors of the economy.[1]

Agriculture sector continues to play a vital role in the country's economy. According to the estimates of 2020, the sector generated 27 percent of total GDP and it is still the main source of income in rural areas.[2] Due to the geographical and climatic conditions Uzbekistan depends heavily on artificial irrigation, most of which still dates back to the Soviet times. This ageing irrigation infrastructure is becoming more inefficient as its service life is overextended, resulting in economic losses that are becoming worse as time goes on.

The water management system operates an irrigation system with a length of 28.4 km, 54,432 units of various related hydraulic structures, as well as 70 reservoirs and mudflow reservoirs with a total volume of 19.4 billion cubic meters. Due to the disproportionate distribution of water resources and the complex topography of irrigated lands, about 60 percent of irrigated lands are provided with water through 1,687 pumping stations, whose annual electricity consumption is 8 billion kWh. In addition, water consumer associations, farms and clusters operate 155.2 thousand km of irrigation network and more than 10,280 pumping units. To improve the reclamation state of irrigated lands, a collector-drainage network with a total length of 142.9 thousand km is operated, of which 106.2 thousand km is open, 36.7 thousand km is closed horizontal, as well as 172 reclamation pumping stations and 3,897 vertical drainage wells.[3]

Similar to many other sectors, the water sector has been subjected to ambitious 'strategy based' reforms in the recent years. Legislative developments place emphasis on increasing efficiency in water use, implementing 'smart water' technologies and diversifying sources of finance for the maintenance and operation of the water infrastructure. The latest amendments to the Law of the Republic of Uzbekistan "On Water and Water Use" ('**the Water Law'**) have facilitated water infrastructure to be transferred [to private entities] for operation on the principles of public-private partnership and other conditions in the manner prescribed by legislation.[4] However, reservoirs, mudflow reservoirs, as well as other large and water facilities with significant importance cannot be transferred to private party operation in accordance with the law.[5]

Privatization of the State owned assets and new economic models for involving private sector, such public-private partnerships (PPP), have been instrumental in facilitating the private sector involvement in the economy. Notable development in the legislation in this regard was the adoption of the Law on Public-Private Partnerships[6] in 2020 and its subsequent amendments (**'PPP Law'**). In line with the changes in the Water Law and the Government's emphasis on the promotion of PPPs in key public sectors of the economy, during 2020-2021, more than hundred

[1] Chapter II: Current Situation in the Water Sector, Concept of Development of the Water Sector of the Republic of Uzbekistan for 2020-2030 (Appendix N 1 to the Decree of the President of the Republic of Uzbekistan dated July 10, 2020 N UP-6024). Available at: https://lex.uz/docs/4892946

[2] World Bank (2021). Uzbekistan: Second Agricultural Public Expenditure Review, page 36. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/36561/Uzbekistan-Second-Agricultural-Public-Expenditure-Review.pdf

[3] Ibid.

[4] Article 19 of the Water Law, dated May 6, 1993, No. 837-XII, as amended in 2021 by the Law of the Republic of Uzbekistan dated November 30, 2021 N ZRU-733, at https://lex.uz/docs/93202

[5] Article 49 and of the Water Law

[6] Law of the Republic of Uzbekistan dated May 10, 2019 N ZRU-537 "On public-private partnership" https://lex.uz/ru/docs/4329272

PPP projects have been concluded in water sector with the total sum value nearly 722 billion UZS (or 66 mln. USD).[7]

The water sector is also financed by water users (indirectly) through taxation for water use. In accordance to the Ministry of Finance, taxpayers paid 688 billion soums in water use tax in 2021. The figure is expected to reach to 900 billion for 2022, which is a 30% increase from previous year.[8] As of today, agricultural water use is taxed at a rate of 40 soums per 1 cubic meter of water.[9]

However, capital allocation from the State budget still remains major source of finance in water sector. Although, it is very difficult to elaborate the exact sum spent from budgetary (and non-budgetary) State sources, due to the complexity of the public finances system and multi-layer reporting practices, there are some available data that may shed some light on the current state of financing in the water sector. The data of the recent years reported by the World Bank suggests that, as it will be discussed in this Report, during 2016-2018, the budgetary allocation for irrigation and drainage works (including electricity cost) remained at around 3 to 4 trillion UZS per year (around 35$ per hectare). This is around 1.3% of the national GDP.[10] If considered against the global average, this ratio is substantially high; but the actual sum is significantly less than what is needed to maintain and modernize the system running, due to the old age of the infrastructure. Official governmental data suggests that water management (sectoral) costs funded from the Republican budget for 2019 remained roughly the same at 3 885 796,7 million (close to 4 trillion) soums.[11] Increase in expenditure was reported for the subsequent years: at 5 028 926,2 million (5 trillion) soums for 2020[12] and 6 620 958,7 million (slightly more than 6.5 trillion) soums for 2021.[13] While this is a substantial increase from 2016-2018 period in nominal terms, in the light of the inflation and the rise in the US dollar exchange rate, the increase in real value terms is not tangible.

Loans from international financial institutions ('IFIs') also play major part of the infrastructure finance allocated to water sector. As of the data available on the Government portal, 926.9 mln. USD is allocated on water infrastructure works from the loans provided by IFIs during the period of 2021 and in the first 6 months of 2022.[14]

The Government is placing a strong emphasis on introducing water saving and agricultural land efficiency technologies on the field level. According to governmental data, in 2021, water-saving technologies were introduced on a land area of 433,000 hectares, and the overall rate of their implementation amounted to 17 percent of irrigated areas of the country.[15] Furthermore, in 2022, the Government targets to introduce i) drip irrigation systems on 230,000 hectares of land; ii) sprinkling irrigation systems on 28,000 hectares of land; iii) discrete irrigation systems on 2 thousand hectares of land; and iv) to level sown areas with the help of laser equipment on 218 thousand hectares of land.[16] In terms of state support measures, the government data suggests that, in 2019-

[7] PPP Development Agency under the Ministry of Finance of the Republic of Uzbekistan, Registry of PPP Projects. Retrieved from https://www.pppda.uz/reyestrga-olingan-loyihalar

[8] Accounts Chamber of the Republic of Uzbekistan (2022). Conclusion of the Accounts Chamber of the Republic of Uzbekistan on the draft Law "On the State Budget of the Republic of Uzbekistan for 2022" and the Budgeting for 2022, page 34. Retrieved from https://static.buhgalter.uz/Julia%20%20YASHINA/0f201f4b-3b58-cd8d-3e4b-a5b3e6666368.pdf

[9] Agricultural water use includes water use for irrigation of agricultural land and breeding (growing) of fish, including use by dekhkan farms, Article 445, Tax Code of the Republic of Uzbekistan, 30.12.2019. At: https://lex.uz/ru/docs/4674893

[10] See discussions in Section 5 of the Report

[11] Accounts Chamber of the Republic of Uzbekistan (2020). Conclusion on the Performance of the State Budget and the Targeted Funds of the Republic of Uzbekistan for 2019, page 18. Retrieved from http://ach.gov.uz/uploads/fda09fb9-139f-b11d-ae11-3c8a6565493b.pdf

[12] Accounts Chamber of the Republic of Uzbekistan (2021). Conclusion on the Performance of the State Budget and the Targeted Funds of the Republic of Uzbekistan for 2020, page 39. Retrieved from http://www.ach.gov.uz/uploads/df3ade09-9271-d2c8-760c-68222ca338c3.pdf

[13] Accounts Chamber of the Republic of Uzbekistan (2022). Conclusion on the Performance of the State Budget and the Targeted Funds of the Republic of Uzbekistan for 2021, page 22. Retrieved from https://ach.gov.uz/uploads/f5cd5b04-4b96-bb40-3d5c-f2cad9ac4993.pdf

[14] Ministry of Water Resources of the Republic of Uzbekistan. Retrieved from https://water.gov.uz/uz/page/1/6

[15] Decree of the President of the Republic of Uzbekistan dated March 1, 2022 N PP-144 "On measures to further improve the introduction of water-saving technologies in agriculture"at https://lex.uz/ru/pdfs/5884591

[16] Ibid., Section 2(a)

2021, a total of 1,218.4 billion soums were allocated from the State budget in subsidies to cover part of the costs of implementing water-saving technologies on 149,099 hectares of 5,835 agricultural producers.[17]

To highlight the current water policy trends, in accordance with the Decree of the President of the Republic of Uzbekistan dated April 6, 2021 N UP-6200 "On measures to further improve the system of state administration and control in the field of the use of water resources, as well as ensuring the safety of water facilities"[18], two new positions were introduced in the system of the Ministry of Water Resources: i) Deputy Minister of Water Resources, responsible for the introduction and development of water-saving technologies; and ii) Advisor to the Minister of Water Resources for the development of public-private partnerships and digital technologies.

Section 2: Introduction

This National Report endeavours to understand patterns of public expenditure for the water sector and the national reforms in terms of water sector's openness to attract the private capital to design, develop, maintain and operate the water infrastructure in Uzbekistan. As highlighted in the executive summary of the Report, irrigation plays a vital role in the country's agricultural sector, thus making infrastructure critical to the functioning of the system. For decades, the irrigation infrastructure was considered as 'public good' and maintained under State ownership. This approach, exacerbated by the Soviet legacy and economic stagnation, lasted till 2017, when the Government of Uzbekistan launched economic reforms in many areas of the economy, including agriculture and water.

The reforms included removal of many market-distorting policies in the horticulture subsector, initial reforms in the cotton and wheat subsectors, and a repurposing of some agricultural public expenditures. As a result, the sector reported a growth of 3.1 percent in 2019 after a reported stagnant period in 2017-2018.[19] In 2020, despite the COVID-19 pandemic, agriculture was a driver of the overall economy's growth, growing by 3.0 percent vis-à-vis GDP growth of 1.6 percent.[20] The Government seeks to accelerate the agricultural growth rate both due to the food security concerns for the growing population and the high agricultural potential of the country. Several governmental authorities are responsible to support and implement state policies and sectoral reforms, including handling public expenditures. In accordance with the 2020 data, the Ministry of Water Resource Management ('MWR') managed the most agricultural public expenditures, which stands at 7,360 billion soums (61 percent) of the total 12,133 billion soums.[21]

However, public expenditure on agriculture in general and water sector in particular, may be higher than the numbers presented in this Report. Estimating true level of agricultural public expenditures in Uzbekistan is not an easy task. Expenditures are spread across several ministries, agencies, and committees, and numbers allocated in budget reports may not provide a comprehensive picture of expenditures due to the involvement of extra-budgetary funds in public spending. Furthermore, donor-financed expenditures, which make a significant contribution to some agricultural programs, are not included in the regular budget reports by sector. However, to the extent it is possible, this Report covers such expenditures in efforts to shed some light on the current state of public expenditures in the water sector and water infrastructure. Data used in this Report have been obtained from budget related legislative documents, reports of the Accounting Chamber of the Republic of Uzbekistan and publications of the IFIs.

Following the executive summary and introduction sections, section 3 of the Report discusses the institutional framework for water governance in Uzbekistan and the reforms of recent years in the water sector with emphasis on infrastructure and technology. Section 4 makes introduction to the legal-institutional framework for the overall

[17] Accounts Chamber of the Republic of Uzbekistan (2021). Conclusion of the Accounts Chamber of the Republic of Uzbekistan on the draft Law "On the State Budget of the Republic of Uzbekistan for 2022" and the Budgeting for 2022, page 53. Retrieved from https://static.buhgalter.uz/Julia%20%20YASHINA/0f201f4b-3b58-cd8d-3e4b-a5b3e6666368.pdf

[18] https://lex.uz/docs/5360451

[19] World Bank (2021). Uzbekistan: Second Agricultural Public Expenditure Review, page 7. Retrieved from: https://openknowledge.worldbank.org/bitstream/handle/10986/36561/Uzbekistan-Second-Agricultural-Public-Expenditure-Review.pdf

[20] Ibid.

[21] Ibid. page 14-15.

budget system of the Republic of Uzbekistan, followed by section 5 on the current status of the public expenditure on water sector (irrigation and drainage). Section 6 explores the legislative reforms that have directly facilitated involvement of the private sector in water infrastructure construction, rehabilitation and/or operation. Finally, the Report ends with reflections on the key findings and proposals for the policy work.

The research for the Report is primarily based on desk-research while relying on the data retrieved from public domains. Some very limited parts of the Report involve qualitative research through personal communications with an expert in the field. For the discussions on legislative reforms, doctrinal method of legal research is used in order to understand the state of law and relevant institutional frameworks.

Section 3: Institutional framework for water governance and latest water sector reforms

3.1. Institutional Governance Framework

The Law of the Republic of Uzbekistan "On Water and Water Use" is the fundamental legal mechanism that provides framework for water governance.[22] Issues of water use and water consumption, including the establishment of water withdrawal limits (quotas), are regulated by the "Regulation on the Procedure for Water Use and Water Consumption in the Republic of Uzbekistan" (entered into force on April 01, 2013), approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan (dated March 19, 2013 No. 82).[23]

Implementation of a unified state policy in the field of integrated and rational use, management and protection of water resources and coordination of the activities of ministries, state committees, departments, other legal entities is carried out by the Cabinet of Ministers of the Republic of Uzbekistan.[24] The Ministry of Water Resources of the Republic of Uzbekistan (for surface waters) and the State Committee of the Republic of Uzbekistan on Geology and Mineral Resources (for groundwaters) are the two specifically authorized state bodies in the field of water use regulation within their respective competences.[25] Local government bodies and territorial water management authorities are directly responsible for regulating the use and management of water resources in their respective territories.[26]

State control over the use and protection of water resources is carried out by several other State bodies, such as the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection, the Inspectorate for Control of the Agro-Industrial Complex under the Cabinet of Ministers of the Republic of Uzbekistan, the Ministry of Health of the Republic Uzbekistan, Inspection for Control over the Use of Drinking Water under the Ministry of Housing and Communal Services of the Republic of Uzbekistan, each within their own competence and in the manner prescribed by law.[27]

The Ministry of Water Resources was created in accordance with Decrees of the President of the Republic of Uzbekistan No. UP-5330 dated February 12, 2018 "On organizational measures for the radical improvement of the system of state management in agriculture and water resources",[28] and No. PP-3672 dated April 17, 2018 "On measures to organize the activities of the Ministry of Water Resources of the Republic Uzbekistan".[29] The organizational structure of the Ministry of Water Resources was further elaborated by the Resolution of the President of the Republic of Uzbekistan dated April 6, 2021 N PP-5055 "On measures to further improve the activities of the Ministry of Water Resources of the Republic of Uzbekistan",[30] as provided in the chart in Annex I of the Report.

[22] Dated from May 6, 1993 No. 837-XII
[23] https://lex.uz/docs/2145599
[24] Article 6, Water Use Law
[25] Article 8, Water Use Law
[26] Article 8, Water Use Law
[27] Article 9, Water Use Law
[28] This Decree has been abolished by the Decree of the President of the Republic of Uzbekistan dated July 8, 2022 No. UP-167 "On making changes and additions to some documents of the President of the Republic of Uzbekistan, as well as regarding some of them as having lost their validity". Available at: https://lex.uz/docs/6104148
[29] https://lex.uz/docs/3687873
[30] https://lex.uz/docs/5360482

3.2. Water Sector Reforms 2017-22

The Government of Uzbekistan's water reforms in the post-Soviet period were primarily concerned with growth of agricultural production and incomes of rural population. Substantial efforts were also placed on the maintenance and development of the enormous water management complex inherited from the past. The recent years have seen a rise in level of water consumption due to population and economic growth while and the supply has decreased due to climate change. These changes in water flow patterns, supplemented by the socio-economic developmental needs, have urged the Government to initiate and undertake reforms targeted at water efficiency. Adoption of National Water Sector Development Concept 2030 and Strategy for Water Resources Management and Irrigation Sector Development 2021-2023 (discussed further below) are central parts of these wide-scale reforms.

Major institutional shake-ups have taken place to more effectively compartmentalize the reforms and policy implementations. In accordance with the Decree of the President of the Republic of Uzbekistan of February 12, 2018 No UP-5330 "On organizational measures to radically improve the system of state management of agriculture and water management", the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan were divided into two separate ministries: i) the Ministry of Agriculture and ii) the MWR. Accordingly, the MWR was designated as a state authority in charge for:

- implementation of a unified policy in the field of water resources management, functioning and improvement of the water management system, taking the necessary measures to ensure the country's water security in the medium and long term; and
- ensuring effective management of water resources, sustainable and rational provision of territories and sectors of the economy with water resources, organization of operation, development and construction of water facilities.

National Water Sector Development Concept 2030

A defining document of the long-term water policy of the Government of Uzbekistan was announced in the Decree of the President of the Republic of Uzbekistan dated July 10, 2020 No. UP-6024 "On approval of the Concept for the development of the water sector of the Republic of Uzbekistan for 2020-2030".[31] The Decree, as the title of the document suggests, approved the Concept for the development of the water sector for the period of 2020-2030 (**'Concept'**). The Concept determined the major directions for the water sector as follow:

1) improving the forecasting and accounting of water resources, the system of formation and ensuring the transparency of the database;
2) modernization and development of water facilities (with the exception of drinking water and wastewater systems), automation of the management of large water facilities based on digital technologies, the widespread introduction of modern technologies that save electricity and other resources, the widespread attraction of foreign investment in the field, as well as ensuring targeted and efficient use of allocated funds;
3) ensuring the safety and reliable operation of reservoirs, flood reservoirs and other water management facilities;
4) improvement of the water resources management system, introduction of "Smart Water" technology and similar digital technologies in keeping records of water use and water consumption;
5) further expansion of the introduction of water-saving irrigation technologies in the cultivation of agricultural crops, provision of state support measures, attraction of foreign investments and grants in this area;
6) improvement of the ameliorative state and ensuring the sustainability of irrigated lands, assisting in increasing land fertility, applying effective technologies to reduce the level and preventing soil salinization;
7) introduction of the principles of a market economy in the water sector, including a system of phased reimbursement by water consumers of part of the costs of water delivery with the direction of the funds received for timely high-quality repairs, restoration and implementation of digital technologies in water facilities and their effective management;

[31] https://lex.uz/docs/4892946

8) the introduction of public-private partnerships and outsourcing in the water sector, the transfer of individual water facilities for use by farms, clusters and other organizations with the use of saved funds for the modernization of water facilities, wages and incentives for workers;
9) introduction of the principles of integrated water resources management, guaranteed provision of the population with water, stable water supply to economic sectors, improvement of water quality and preservation of the ecological balance of the environment;
10) development of interstate relations on the use of transboundary water resources, development and promotion of mutually acceptable mechanisms for the joint management of water resources and programs for efficient water use, ensuring a balance of interests of the countries of Central Asia;
11) training qualified personnel for the water sector, improvement of the system of advanced training for workers, development of mutual cooperation in the fields of education, science and production, as well as the introduction of scientific achievements and know-how into production.

The Concept, while do not create a legally binding obligations on Government authorities and other entities, they do define the priority areas of sectoral development. Key targets of the Government policy for water for the a 10-year period are modernization of infrastructure, extensive use of technology and data in water management, strong emphasis on water saving and efficiency, implementing market principles and involving private actors in water sector. The Concept stipulated the development of a three-year strategy for the management of water resources and the development of the irrigation sector and introducing amendments to Water Law.

The Strategy 2021-2023

In line with the objectives of the Concept, Presidential Resolution No PP-5005 was adopted on February 24, 2021, approving the Strategy for Water Resources Management and Development of the Irrigation Sector in the Republic of Uzbekistan for 2021-2023 (**'Strategy'**).[32] The Strategy sets clear targets and milestones to be achieved during a 3-year period, which includes a number of infrastructure, policy, institutional and capacity building measures covering the issues of sustainable water resources management and modernization of the country's irrigation sector, as well as programs and a set of measures aimed at managing water resources and developing the country's irrigation sector. In particular, the Strategy targets:

- increase the share of canals with concrete coating from 35 to 38 percent in the canal irrigation system, increase in the efficiency of the irrigation system and irrigation networks from 0.63 to 0.66;
- reduction of the irrigated area with a low level of water supply from 526 thousand hectares to 424 thousand hectares;
- replacement of 518 units of pumping units and 807 units of electric motors of pumping stations under the system of the Ministry of Water Resources with modern energy-saving replacements, reducing their annual electricity consumption from 7.6 billion kW. h to 7.15 billion kW. h;
- bringing the introduction of water-saving irrigation technologies from 308 thousand hectares to 1.1 million hectares, including drip irrigation technologies - from 121 thousand hectares to 822 thousand hectares;
- reduction from 1,926 thousand hectares to 1,888 thousand hectares of the area of saline lands, including medium and highly saline - from 581 thousand hectares to 532 thousand hectares;
- reduction of the irrigated land areas with a critical level of groundwater (0-2 meters) from 988 thousand hectares to 900 thousand hectares;
- re-introduction into circulation of 232 thousand hectares of irrigated land that have been removed from agricultural circulation;
- construction and restoration of 6 hydrological posts on rivers and sais, equipping 6 hydrological posts with automated equipment based on digital technologies;
- bringing the number of water management facilities that record water based on the digital technology "Smart Water" ("Smart Water") to 18,576 units;
- Introducing a digital technology based automated control system to 60 large water facilities;
- setting up online monitoring of the electricity and water consumption by 5,231 pumping units of 1,688 pumping stations of the system of the Ministry of Water Resources;

[32] https://lex.uz/docs/5307921

- monitoring 2,100 functioning reclamation observation wells using digital technologies;
- implementation of a total of 124 projects in the water sector on the basis of public-private partnerships, while 9 percent of the cost of delivering water for irrigation is reimbursed by water consumers.

Funding under the Strategy

While neither the Resolution nor the Strategy explicitly provide sources of funding for the works stipulated above, it does provide the list of projects to be funded by the loans from the Multilateral Development Banks (MDBs).[33] The Resolution also determines that starting from 2021, as part of the annual measures to improve the ameliorative condition of irrigated lands, within the parameters of the State Budget of the Republic of Uzbekistan, the costs of repair and restoration of facilities are transferred from the Republican budget to the local budgets of the regions. Furthermore, the Resolution stipulates that the financing the costs of repair and restoration works at facilities of the Republic of Karakalpakstan shall be covered at the expense of the Republican budget of the Republic of Karakalpakstan.[34] This a notable indication to the Government's intention to decrease pressure from the Republican budget.

The Strategy sets well-defined scope of work with the involvement of the private sector through the mechanisms of the public-private partnerships (PPP). Accordingly, conclusion of 124 PPP projects is projected during the 3-year period (30-2021; 42-2022; 52-2022).[35]

Amendments to Water Law

In line with the Strategy, the Water Law was introduced amendments to reflect the latest policy trends of the Government, which were signed into Law on November 30, 2021. The revised Law strengthens the powers of state authorities and administration in the field of regulating relations related to water, while reemphasizing the role of Water Consumer Associations in the functioning of water sector.

Furthermore, the revised Law imposes obligation on water consumers to adopt digital technologies, although it is not clear what would be consequences in failing to do so. At the same time, enterprises, organizations, institutions and individuals are prohibited from violating the regime of water protection and sanitary protection zones of water bodies. The obligations of water users using water resources for agricultural needs include such obligations as the effective use of subsidies from the state budget for each project to introduce water-saving technologies for at least five years, as well as the implementation of agro technical measures to save water resources. The Law establishes that the measures to eliminate harmful effects are carried out at facilities that are on the balance sheet of organizations financed from the state budget at the expense of the relevant budgets, and at facilities that are on the balance sheet of water consumers - at their own expense (Article 105 of the Water Law).

In terms of private partner ownership and involvement in water sector, the amendments introduce two notable changes that are relevant for the purposes of this Report:

1. The amendments introduce the concept of PPP to the Water Law (Article 49), under which water objects (infrastructure) can be transferred to a private partner for exploitation; and

2. The paragraph 2 of the same Article 49, in the revised version, omits the phrase "cannot be privatized", possibly creating the path towards privatization of some of the water infrastructure in the future. See below:

Previous version – paragraph 2, Article 49	**Current version – paragraph 2, Article 49**
The lands of the water fund, water facilities, water management facilities and facilities of operating water	*The lands of the water fund, water facilities, water management facilities and facilities of operating water*

[33] See Annex 2

[34] Section 10 of the Resolution

[35] Appendix No. 15 to the Strategy

management organizations located in the contours of irrigated lands are operated as a single water management system and are state property and cannot be privatized.	*management organizations located in the contours of irrigated lands are operated as a single water management system and are state property*.

The same Article in paragraph 4 explicitly excludes reservoirs, mudflow reservoirs, as well as large and especially important water management facilities from being subject to privatization.

The revised law also reflects the separation of the Ministry of Agriculture and Water Resources into two and 'the Ministry of Water Resources' replaces 'the Ministry of Agriculture and Water Resources' throughout the Law.

Although, the section does not claim to be a full-fledged review of the latest reforms in the water sector, it does highlight the two policy priorities of the Government. The first is promotion and increase in the use of water (and energy) efficiency technologies in the water management. The second is diversifying the sources of funding through engaging private sector in the operation and maintenance (and possibly ownership) of water infrastructure. But above all, the reforms stipulated in these documents are a strong indication of a political recognition that business as usual is no longer an option. These efforts now need to be further accelerated with well defined, financially sound business strategies and pathways for the private sector participation. While provision of water sector and related infrastructure services remain (rightly so) a public duty, engaging private sector capital in delivering these services requires return on investment for the private sector, an important competent of 'sustainability'. More discussions on this will be provided in Section 8.

The sections below will discuss the budgetary framework and funding of the water sector, followed by the legal framework enabling the participation of private sector.

Section 4: Legal and Institutional Framework for Budget Maintenance

The Republic of Uzbekistan is a unitary State with the Presidential system of Governance. The Constitution defines the structure of the State having legislative, executive and judicial powers. Executive power is exercised by the government. Legislative power is vested in the two chambers of the Parliament (known as "Oliy Majlis"): (i) the Senate and (ii) the Legislative Chamber. While the Constitution is the supreme law of the Republic of Uzbekistan, there are a number of legal mechanisms in the hierarchy of legislative acts that regulates functioning of the budget system and maintenance of public finances in the country:

i. **Budget Code (2013)**: replaced the previous Budget System Law and introduced the principle of the effectiveness of the use of the budgets of the budget system, the principle of transparency, the preparation of the budget for more than one fiscal year, the strengthening budgetary authorities of the regions. The Code also defines the responsibility of the relevant State bodies in formulating and executing the budget.[36]
ii. **Tax Code (2019)**: replaced previous edition of the Tax Code (2007). The Code regulates the tax system, defines taxable bases, sets the rights and obligation of taxpayers, provides legal framework for tax control and inspection and the responsibility for non-compliance.[37]
iii. **Law on Public Procurement (2018):** defines subjects of public procurement and scope of authority of related State bodies, regulates public procurement procedures, procurement methods, monitoring, control and complaints.[38]

[36] Budget Code of the Republic of Uzbekistan (Approved by the Law of the Republic of Uzbekistan dated December 26, 2013 N ZRU-360). At: https://lex.uz/docs/2304140
[37] Tax Code of the Republic of Uzbekistan (Approved by the Law of the Republic of Uzbekistan dated December 30, 2019 N ZRU-599). At: https://lex.uz/ru/docs/4674018
[38] Law of the Republic Uzbekistan, dated April 22, 2021 No ZRU-684. At: https://lex.uz/docs/5382983

iv. **Customs Code (2016)**: regulates the transportation and import and export of goods across the country border, payment of duty, customs clearance procedure and documentation; customs control and inspection and the related information for the public.[39]

v. **Law on Parliamentary Control (2016):** defines the scope of Parliamentary control over the execution of the State budget. The Ministry of Finance of the Republic of Uzbekistan quarterly sends information and necessary materials to the chambers of the Oliy Majlis on the implementation of the State budget. Oliy Majlis also hears the report of the Accounts Chamber of the Republic of Uzbekistan on the implementation of the budget.[40]

vi. **Law on Accounts Chamber (2019):** defines the authority and responsibilities of the Account Chambers in formulating the budget and control over its execution.[41]

In addition to the laws above, budget system and the public finance management is also regulated through decrees, regulations, decisions and other normative documents.

The State budget consists of the Republican budget of the Republic of Uzbekistan and the budget of the Republic of Karakalpakstan, local budgets of regions and the city of Tashkent. The Budget Code divides the beneficiaries of the State budget into two categories:

1. Budgetary organization – a non-profit organization established by the decisions of State authorities in the prescribed manner for the implementation of state functions, maintained at the expense of the State budget (Article 4); and
2. Recipient of budget funds – a legal or natural person receiving funds from the State budget and the budgets of state targeted funds (Article 5).

The budget, as a system, involves a set of budgets of all levels, budgets of state trust funds and extra-budgetary funds of budgetary organizations, principles of construction and organization of budgets of the budget system, relationships that arise between them during the budget process. In accordance with the Article 46 of the Budget Code, the consolidated budget of the Republic of Uzbekistan includes:

1) the State budget;
2) budgets of the State targeted funds;[42]
3) off-budget funds of budgetary organizations;[43]
4) funds of the Fund for Reconstruction and Development of the Republic of Uzbekistan under the Cabinet of Ministers.[44]

For the Summary of Parameters of the Consolidated Budget of the Republic of Uzbekistan for 2022 please refer to Annex III of this Report.

[39] Customs Code of the Republic of Uzbekistan (Approved by Law RUz dated 20.01.2016 N ZRU-400). At: https://lex.uz/docs/2876352

[40] Law of the Republic of Uzbekistan, dated April 11, 2016 No. ZRU-403. At: https://lex.uz/docs/2929475

[41] Law of the Republic of Uzbekistan, dated July 1, 2019 No. ZRU-546. At: https://lex.uz/docs/4394326

[42] State targeted funds are created with the Decision of the President of the Republic of Uzbekistan for the implementation of state functions, whose funds are formed from taxes, mandatory payments and fines, sponsorship funds and other sources established by decisions of the President of the Republic of Uzbekistan and the Cabinet of Ministers of the Republic of Uzbekistan, as well as budget transfers and subsidies (Article 36, the Budget Code).

[43] Extra-budgetary funds of budgetary organizations are: Development Fund of a budgetary organization; Fund for Material Incentives and Development of Medical Organizations; off-budget funds of ministries, state committees and departments; extra-budgetary funds of budgetary organizations, formed at the expense of fees charged (Article 44, the Budget Code)

[44] The Fund for Reconstruction and Development of the Republic of Uzbekistan is a financial institution under the Cabinet of Ministers of the Republic of Uzbekistan with the objective to finance priority investment projects and projects for the modernization, technical re-equipment of the fundamental sectors of the economy, the achievement of a dynamic, sustainable and balanced socio-economic development of the country, and the implementation of effective structural and investment policies (Article 47, the Budget Code). The Fund's finances are sourced by i) the proceeds from the excess of the world price for strategic resources over the cut-off price established by decisions of the President of the Republic of Uzbekistan when approving the forecast of the main macroeconomic indicators and parameters of the State budget; ii) investment returns from assets managed by the Fund; iii) other sources in accordance with the legislation (Article 48, the Budget Code).

The State-owned enterprises (corporate and non-corporate) also play an important role in shaping the State budget as they dominate the economic sectors recognised by the Government as entities of national strategic interest. Some of the large-scale public corporations perform commercial activities and act as government institutions.[45] They are monopolistic by nature and operate in sectors that are included as sectors of national monopoly.[46] Such entities' impact on the budget can be explained as both a budget formulating taxpayer and the recipient of State funds through subsidies and other forms of State support measures. According to the World Bank data, the operations of over 2,000 SOEs and other public sector activities represent about half of Uzbekistan's GDP, and SOEs account for about 18 percent of employment and 20 percent of exports. State-owned assets are concentrated among 15 large SOEs, with total assets in 2019 equivalent to 57 percent of GDP.[47]

Ministry of Finance is the authorized State Body and acts as a guardian of the State budget and performs functions related to forecasting budget revenues, preparing the draft of annual budget law, executing the budget and maintaining control over appropriate use of budget funds in accordance with their respective targets.[48] As a rule, the Parliament adopts an annual budget law at the end of each year for the following budget year setting up macro-economic parameters for the coming year.

Revenues of the State budget are formed from:

- taxes and other obligatory payments;
- income from the placement, provision for use and sale of state assets;
- funds that have passed into the ownership of the state by right of inheritance, donation;
- gratuitous cash receipts from legal entities and individuals, as well as foreign states;
- payments on account of the return of funds from budget loans, credit lines and loans granted to resident legal entities and loans issued to foreign states, as well as interest income on them;
- other income in accordance with the law.[49]

Structure of expenditures of the State budget is elaborated by the Budget Code to include:

- spending on the social sphere and social support of the population;
- expenses for state support of non-governmental non-profit organizations and other civil society institutions;
- spending on the economy;
- the cost of financing centralized investments;
- expenses for the maintenance of public authorities and administration, justice and prosecutor's offices;
- expenses for the maintenance of judiciary;
- expenses for the maintenance of self-government bodies of citizens;
- other expenses.[50]

The commentators note that Uzbekistan's economic transformation since late 2016 has resulted in an increased budget transparency, improved the management of public finances, simplified the tax system, and reduced the tax burden, which has yielded remarkably ambitious steps with positive and tangible benefits. Public Expenditure Review conducted by the World Bank in 2019 (**'Review'**) is a remarkable indication to the increased transparency

[45] For instance, JSC "Uzkimyosanoat" acts as both commercial holding company and as a State regulatory body in chemicals sector

[46] Law of the Republic of Uzbekistan of 24.04.1997 N 398-I "On natural monopolies" (New edition. Approved by the Law of the Republic of Uzbekistan of 19.08.1999 N 815-I)

[47] World Bank (2022), Toward a Prosperous and Inclusive Future: The Second Systematic Country Diagnostic for Uzbekistan. Retrieved from: https://documents1.worldbank.org/curated/en/933471650320792872/pdf/Toward-a-Prosperous-and-Inclusive-Future-The-Second-Systematic-Country-Diagnostic-for-Uzbekistan.pdf

[48] Article 29, the Budget Law

[49] Article 50, the Budget Code

[50] Article 69, the Budget Code

in the system.[51] Furthermore, the 2020 budget was the first to be adopted through a law rather than a presidential resolution, highlighting the growing role of Uzbekistan's Parliament in the budgetary process.[52]

The Review notes that prior to the start of reforms in 2016, more than half of government spending was listed as carried out outside the budget, whether by extrabudgetary funds (EBF) or off-budget accounts. Since 2020, 20 out of these existing EBFs are consolidated into the budget – including the Uzbekistan Fund for Reconstruction and Development (UFRD). As one author notes, this is substantial progress, although [as of 2020] one-third of the country's spending were still done through EBFs and off-budget accounts.[53]

Section 5: Public expenditures on water sector

With the split of the Ministry of Agriculture and Water in 2017, several departments of the Ministry became separate agencies, committees, and inspections and all of them [and other Ministries) are in one way or the other are responsible for agricultural expenditure within their competencies. The agricultural public expenditures include non-cash payment State support measures, such as tax expenditures/exemptions, which otherwise would have been budget income. The available data for the period from 2016 to 2018 (World Bank using Ministry of Finance data), shows that in nominal terms, the agricultural budget increased by 45 percent during 2016-2018.[54] It was 5.0 trillion Soms in 2016 and 7.2 trillion Soms in 2018. But in real terms, adjusted for inflation, it stayed flat. Calculated in US dollars, the volume of expenditure declined, following the liberalization of exchange rate in 2017. Against the total GDP, it averaged 2 percent, which, as the authors show, 10 times more than the average spending as a share of GDP in OECD countries and 3 times more than in non-OECD countries.[55] The above estimates for Uzbekistan do not include projects supported by development partners, which amounted $2.5 billion (or 21 trillion soums).[56]

Table: Agricultural expenditures:

	2016	**2017**	**2018**
Agricultural public expenditures, *nominal billion soums*	4,982	5,663	7,225
Agricultural public expenditures, *real billion soums*	4,982	4,585	4,992
Agricultural public expenditures, *nominal million $*	1,542	710	881
in percent of GDP	2.1	1.9	1.8
in percent of Gross Agricultural Output	2.6	2.9	3.6

Most public expenditures are allocated for agriculture are largely for irrigation and drainage. Accordingly, the largest share of funds is executed by the MWR, which implements irrigation and drainage programs. Please see the table below:

	2016	2017	2018
MWR	3,036	3,419	4,100
MOA (Ministry of Agriculture)	733	848	655
MOF (Ministry of Finance)	231	317	766
Cabinet of Ministers (Veterinary and Plant Quarantine)	0	0	289
Forestry	52	59	69
Research and Education (various ministries)	400	492	410

[51] World Bank (2020) Uzbekistan - Public Expenditure Review. Retrieved from: http://documents.worldbank.org/curated/en/471601582557360839/Uzbekistan-Public-Expenditure-Review

[52] This change was brought by the Law of the Republic of Uzbekistan dated 09.12.2019 N ZRU-590 "On amendments and additions to some legislative acts of the Republic of Uzbekistan in connection with the improvement of the budget process". At: https://lex.uz/docs/4634892

[53] Izvorski, I. (2020), Improving Uzbekistan's public finances: More transparency, better budgeting, and lower taxes. Retrieved from: https://blogs.worldbank.org/europeandcentralasia/improving-uzbekistan-public-finances

[54] World Bank (2020), Uzbekistan - Public Expenditure Review. Chapter 7. Agriculture. Retrieved from http://documents.worldbank.org/curated/en/471601582557360839/Uzbekistan-Public-Expenditure-Review

[55] Ibid.

[56] Ibid.

Other (various ministries)	462	528	732
Total	**4,913**	**5,663**	**7,058**

Source: World Bank using the MoF data[57]

As such, irrigation and drainage accounted for about 1.2 percent of GDP in 2016-2018. Although, as the commentators note, this is a large amount in terms of GDP for any country in the world, the figures fall short of expected requirements for both capital and operational expenditures. More than a third of irrigation and development budget is spent on covering electricity cost of water pumping. See the table below:

	2016	**2017**	**2018**
Capital investments in irrigation	500	443	731
Capital investments in drainage	404	454	541
O&M	2,105	2,483	2,804
including the cost of electricity	1,292	1,489	1,592
Total (billions of soums)	**3,009**	**3,380**	**4,076**
in percent of GDP	1.2	1.1	1.0

Source: World Bank using the MOF data[58]

The team of World Bank consultants argue that even though per GDP ratio is high, the current level of capital expenditures has been too low to start modernization of irrigation and drainage infrastructure and management. The actual capital irrigation and drainage investments in 2018 were 1,274 billion soums. Calculated against the numbers provided by the Ministry of Water Resources, that the irrigated area is 4.3 million ha, the capital expenditure for each hectare was $35, while the requirement is to spend at least $250/ha without irrigation modernization. The authors further argue that, to secure reliable, adequate, and flexible irrigation water supply, the capital investments would need to increase to $1,400/ha, and the modernization of the entire irrigation and drainage infrastructure over 2015-2030 would cost between $5.5 billion to $16 billion. More is also required for O&M spending. Actual budget (without electricity cost) is $40/ha, while the requirement is $80/ha.[59]

Research into the budget laws of the 2020-2022 shows the similar trend in terms of water sector budget allocation if read together with the World Bank data above.

Year of 2020

In accordance with Law of the Republic of Uzbekistan No ZRU-589, dated December 09, 2019 "On the State Budget of the Republic of Uzbekistan for 2020", MOW was allocated following sums from the State budget:

Current expenses	1 661 891,1 mln. soums
capital investments for the design, construction (reconstruction) and equipping the water facilities	1 540 781,1 mln. soums
Total allocation to MWR for 2020:	**3 202 672,2 mln. UZS**

However, official data on the execution of the public expenditures in the Assessment Report of the Accounting Chamber on the Execution of State budget and State Targeted Funds in 2020 (**'Assessment Report 2020'**) indicates to the higher expenditures than those allocated to the MWR by the budget law.[60] See the table below:

[57] Ibid.
[58] Ibid.
[59] Ibid.
[60] The Government of Uzbekistan. Retrieved from http://www.ach.gov.uz/uploads/df3ade09-9271-d2c8-760c-68222ca338c3.pdf. Page 39.

Expenses on the economy *in million soums*	**16 378 005,8** (target)	**16 692 754,4** (actual performance)	**101,9%**
of which:			
Water management expenses	5 113 006,1	**5 028 926,2**	98,4%
Reclamation works on irrigated lands	367 755,0	366 682,4	99,7%
Works on improvement of settlements	2 435 703,1	2 678 417,4	110,0%
nature conservation	271 339,8	272 528,8	100,4%
housing and communal works	469 530,1	471 929,6	100,5
Development of public roads	2 697 964,1	2 697 939,1	100,0

The higher expenditure rate shown in the Assessment Report 2020 can be explained by the multi-institutional spending on the water related works. While the MWR is the main organization through which the funds are channelled to the water sector, the Government allocates funds to the sector through other institutions too (could be State targeted funds or through transfers to the local budgets.

Year of 2021

Interestingly, the initial amount of the 2021 budgetary allocation to the MWR decreased from the 2020 figures. In accordance with the Law of the Republic of Uzbekistan dated December 25, 2020 N ZRU-657 "On the State Budget of the Republic of Uzbekistan for 2021" (**'Budget Law for 2021'**), the figures stood as follow:[61]

current expenses	1 689 434,7 mln. Soum
spending on development programs	1 280 187,5 mln. Soum
expenses for the introduction of drip irrigation by cotton producers	198 872,0 mln. Soum
expenses for the implementation of repair and restoration work of land reclamation facilities	329 205,5 mln. Soum
energy consumption costs of pumping stations	752 110,0 mln. Soum
capital investments for the design, construction (reconstruction) and equipping the water facilities	1 281 634,0 mln. Soum
Total allocation to MWR for 2021:	**2 971 068,7 mln Soum**

Although, the Budget Law 2021 sets the limit of budgetary allocation to MRW at 2 971 068,7 mln Soum (and no amendments to the law is recorded), the Assessment Report of the Accounting Chamber on the Execution of State budget and State Targeted Funds in 2021 (**'the Assessment Report 2021'**) has reported budget execution by MRW for 3 226 568,0 Soum.[62] This research could not identify a legal base for such discrepancy, which is deviation from the Budget Law for 2021.

[61] https://lex.uz/docs/5186047

[62] The Government of Uzbekistan. Retrieved from http://www.ach.gov.uz/uploads/f5cd5b04-4b96-bb40-3d5c-f2cad9ac4993.pdf. Page 31.

The overall public expenditure for water management expenses for 2021, according to the Assessment Report 2021, to be at **6 621 000,0 million Soum**.[63] In nominal terms, this is 1 592 074,0 million Soum increase from 2020.

Year of 2022

According to the Law of the Republic of Uzbekistan of December 30, 2021 N ZRU-742 "On the State Budget of the Republic of Uzbekistan for 2022", the following budget limits allocated to the MWR:[64]

current expenses	2 190 003,5 mln. Soum
spending on development programs	1 737 110,0 mln. Soum
costs to cover part of the costs of introducing drip irrigation by raw cotton producers	935 000,0 mln. Soum
costs of electricity consumption by pumping stations	802 110,0 mln. Soum
capital investments for the design, construction (reconstruction) and equipping the water facilities	1 250 000,0 mln. Soum
Total limit for MRW in 2022:	**3 440 003,5 mln. UZS**

The total sum allocated to the MRW in 2022 is consistent with the budget allocation of previous years.

As discussions above suggest that constructing the comprehensive map of public expenditures for water sector (as well as agriculture in general) is not an easy task. The complexity and incoherence in the reported figures can be explained by the evolving budgeting system of the country, which is still a work in progress. Nevertheless, the available data is still useful in terms of demonstrating general picture on the current state of public expenditures and the existing gap in funding. The World bank analysis show that the gap is significant and despite the fact that the current spending is large enough in terms of GDP ratio, it is far behind than the amount actually needed to ensure sustainable functioning of the water sector in the long term. The latest reforms discussed in this Report reflects the Government's desire to diversify source of funding for the sector.

While the State budget is the main source of funding for the maintenance and operating the water sector, water use itself is subject taxation, through which the water users in various sectors (including in agriculture) contribute to the State budget. The next Section will look into this and associated figures, followed by the Section on the private sector involvement in the water sector.

Section 6: Water use tax

The legislation makes the water use subject to taxation. In accordance with the Article 445 of the Tax Code of the Republic of Uzbekistan, water use is subject to taxation under the following tax rates:

No.	**Taxpayers and objects of taxation**	**Tax rate for 1 cube/m** (in soums)**:**	
		surface sources water resources	underground springs water resources
1.	Enterprises of all sectors of the economy (with the exception of those specified in paragraphs 2 and 3), as well as individual entrepreneurs	240	290
2.	Industrial entities	520	620

[63] Ibid., page 22.
[64] https://lex.uz/docs/5801129

3.	Power plants and utilities	80	100
4.	Water used for irrigation of agricultural land and breeding (growing) of fish, including dekhkan farms	40	40
5.	Volume of water used to wash vehicles	2 190	2 190
6.	The volume of water used for the production of soft drinks and alcoholic products, except for beer and wine	27 700	27 700

According the Ministry of Finance of the Republic of Uzbekistan, **688 billion soums were to be collected in taxes from water use in 2021**, while 900 billion soums are forecasted in the similar tax for 2022, which is an increase of 30 % from the previous year.[65]

It is worth to note that the Government decreased the tax rate for agricultural water use for more than 50%, while increased the rate for the water use for industrial purposes. Please refer to the table below for **water use tax rates in 2017**:[66]

No.	**Taxpayers and objects of taxation**	**Tax rate for 1 cube/m** (in soums):	
		surface waters	underground springs waters
1.	Legal entities of all sectors of the economy (except for those specified in paragraphs 2-4), **farms (legal entities and individuals)**, as well as individuals who use water resources in the course of business activities	84,50	108,5
2.	Power stations	24,7	36,7
3.	Communal utilities	46,9	60,6
4.	Non-alcoholic drinks producers	13 800	13 800

Section 7: The Role of Private Sector and Private Capital in Water Sector

In accordance with the laws of the Republic of Uzbekistan, there is a limited number of legal mechanisms available for private sector to participate in socio-economic and infrastructure projects that involve State and State-owned assets. These are:

1. Privatization
2. Public-private partnerships (includes concessions)
3. Trust Management
4. Clusters

7.1. Privatization

Privatization is defined as a process which refers to the acquisition from the state by individuals and non-state legal entities of assets of public ownership or shares of state joint-stock companies in accordance with the Law No. 425-XII "On Denationalization and Privatization", dated November 19, 1991 (**the Law on Privatization**). The Law on Privatization authorizes the Cabinet of Ministers (or government bodies authorized by it) with the right to make a decision on privatization of objects of Republican property of the Republic of Uzbekistan. What constitutes Republic property is defined by Article 214 of the Civil Code, which includes 'land, subsoil, water, air space, flora and fauna and other natural resources, property of Republican bodies of State authority and administration, objects of material cultural heritage of state importance, funds in the Republican budget, gold

[65] Accounts Chamber of the Republic of Uzbekistan (2021). Conclusion of the Accounts Chamber of the Republic of Uzbekistan on the draft Law "On the State Budget of the Republic of Uzbekistan for 2022" and the Budgeting for 2022, page 34. Retrieved from https://static.buhgalter.uz/Julia%20%20YASHINA/0f201f4b-3b58-cd8d-3e4b-a5b3e6666368.pdf

[66] APPENDIX 14 to the Resolution of the President of the Republic of Uzbekistan No. PP-2699 of December 27, 2016, at https://lex.uz/docs/3085627

reserves, foreign exchange fund and other State funds, and there may also be enterprises and other property complexes, educational, scientific, research institutions and organizations, the results of intellectual activity that are created or acquired at the expense of budgetary or other State funds, and other property'. This definition is important for the purposes of this Report due to the fact that the 'ownership' of water infrastructure rests with the Ministry of Water Resources and its territorial units (the Republican body of state authority and administration). Accordingly, the water infrastructure can be privatized in accordance with the decision of the Cabinet of Uzbekistan. Furthermore, as discussed above, the Water Law, in its amended version, abolished the ban on privatization of water infrastructure with the exception of large strategic water infrastructure.

The analysis in the above paragraph shows that in theory the water infrastructure can be financed by private entities through privatization. However, the research into legislation did not identify any legislative act that authorises the same. This could be due to the important socio-economic significance the irrigated agriculture plays in the rural context, upon which the Government wants to maintain control. If privatized, the Government interference in the operation of water infrastructure will significantly decreased. Therefore, while legally speaking it is possible to privatize the water infrastructure, currently this does not seem to be in the policy agenda of the Government.

7.2. Public-private partnerships

One of the legal instruments to facilitate private finance into key public sectors of the economy is public-private partnership (PPP). PPP facilitates a cooperation between the state and the private sector aimed at solving social, economic and infrastructural problems. While PPPs have been in practice in the developed world for a few decades now, it is a new phenomenon for Uzbekistan. The concept of PPP was first introduced at the legislative level on 5 April 2018, by the Regulation on Public–Private Partnership in the Sphere of Preschool Education No. PP-3651. Since then, a number of regulatory by-laws have been adopted at the level of the President and the Cabinet of Ministers of Uzbekistan designed to regulate the procedures for procurement of PPP projects in some other industries, such as healthcare and public utility services.

Major improvements in the PPP practice and legislative framework happened with the establishment of the Public–Private Partnership Development Agency (PPPDA) – under the Ministry of Finance by the Presidential Decree No. PP-3980 of 20 October 2018 and adoption of the Law on Public–Private Partnership No. ZRU-537 dated 10 May 2019 (the PPP Law). The energy industry has been the most popular PPP sector in Uzbekistan accounting for more than half of the overall foreign investments attracted in PPP projects. PPP mechanism has been promoted by the Government to support ambitious energy sector development programme aimed at almost doubling the volumes of produced energy by 2030.

The PPP law was introduced substantial changes by the Law No. 669 January 22, 2021, which addressed certain gaps and shortcomings in the Law. Under the amended version of the law, the ministries, state agencies, local municipalities and other authorised entities can act as a public partner, while previously only the Republic of Uzbekistan could be a public partner in any PPP project. The Law also now allows winning bidders to set up a special purpose vehicles (SPVs), which enters into PPP agreement as a private partner. Previously, only a winning bidder could become a private partner.

As discussed above, PPP has been instrumental in the attraction private capital to the maintenance and operation of public infrastructure. The Water Law has been amended to support this policy trend. In addition, the Government adopted Resolution No.199 on April 10, 2021 to initiate the process of transferring 100 irrigation pump stations throughout the country for private partner operation under PPP mechanism.[67] The publicly available data shows that in 2021 alone 93 PPP projects were concluded that envisage the transfer of pump stations to the private sector operation.[68] The Decree determines the Ministry of Water Resources as a public partner, who is authorised to enter into direct negotiations with potential private partners (without holding a competitive bidding process). In accordance with the legislation, PPDA maintains the registry of PPP projects. It

[67] Resolution "On measures to expand public-private partnership in the field of rational use of water resources and agricultural facilities" https://lex.uz/ru/docs/5370968

[68] PPP Development Agency under the Ministry of Finance of the Republic of Uzbekistan. Retrieved from https://www.pppda.uz/reyestrga-olingan-loyihalar

is also important to note that under PPP mechanisms, the legal ownership of the assets may or may not be transferred to private sector, while providing public services. It depends on the agreement of the parties.

The Government's efforts to promote PPPs in water sector seems to be yielding results. The available data for the period of 2020-2022, more than hundred PPP projects have been concluded in water sector (primarily pump operation) with the total sum value nearly 722 billion UZS (or 66 mln. USD). The available official data does not provide much information on these projects.

7.3. Trust Management

Under a mechanism of trust management, one party (the founder of the management or *the trustor*) transfers, for a certain period of time, the property to the other party (*the trustee*) in trust management, and the other party undertakes to manage this property in the interests of the founder of the management or the person specified by him (the beneficiary) (Article 849 of the Civil Code). The transfer of property for trust management does not entail the transfer of ownership of it to *the trustee* – the ownership of the asset remains with the legal owner, that is *the trustor*. When carrying out trust management of property, the trustee has the right to perform any legal and actual actions in relation to this property in accordance with the trust management agreement in the interests of the beneficiary.

The research shows that the Government of Uzbekistan, at least in one occasion, has had a recourse on trust management mechanism in relation to water infrastructure. In accordance with the Decree of the President of the Republic of Uzbekistan No. PP-141 dated February 22, 2022 "On measures to improve the management of the Aidar-Arnasay system of lakes"[69] (**the Decree**), the State Unitary Enterprise "Directorate of the Aidar-Arnasay System of Lakes" under the State Tax Committee was re-organized as a limited liability company "Aidar-Arnasay System of Lakes" (**LLC "Aidar-Arnasay System of Lakes**"). According to the Decree, the Ministry of Water Resources acts as a founder/shareholder of the LLC "Aidar-Arnasay System of Lakes", while the Aidar-Arnasay system of lakes, located on the territory of Jizzakh and Navoi regions is transferred on a permanent basis to LLC "Aidar-Arnasay system of lakes". Such move envisages the development of the fishing and tourism industry.

The Decree further authorises the relevant governmental bodies, within four months, to transfer the management of the LLC "Aidar-Arnasay system of lakes" to the trust management by a domestic investor with relevant experience in breeding unique fish species and possessing fish processing technologies. The domestic investor to be determined on a competitive basis, subject to making investments and stocking water bodies in the prescribed manner. The Decree obliges the potential investor with the following tasks to be performed during 2022-2026:

i. making investments in the amount of at least 30 million US dollars;
ii. bringing the capacity of annual breeding of fish larvae to 100 million units, fish fry - up to 15-20 million units with full use of the capabilities of incubation shops and reproductive reservoirs, as well as stocking the lake system with fish fry;
iii. bringing the annual catch of fish in the lake system to 15,000 tons and breeding an additional 5,000 tons of fish by installing ocean cages;
iv. creation of a fish production complex on the territory of the Tuzkon lake of the Aidar-Arnasay system of lakes and the launch of an enterprise for processing 3 thousand tons of fish per year in this complex;
v. wide attraction of investments and establishment of marketing with the effective use of the opportunities of the lake system and its environment, as well as the creation of 1,000 jobs through the development of processing;
vi. increasing the tourist potential of the territory and expanding amateur and sports fishing tourism with the effective use of its capabilities, increasing the volume of services provided to travellers;
vii. conservation of biodiversity and increase in fish stocks of the lake system based on a scientific approach;
viii. creation of a laboratory center for increasing stocks of fish in the salt water of the lake system with the involvement of foreign specialists;
ix. carrying out a complete cleaning of collector-drainage networks in the territory of the lake system.

[69] https://lex.uz/ru/docs/5874665

If the investor fulfils all obligations arising from the Trust Management Agreement, the term of the agreement to be extended to 49 years. As of July 2022, there is no data available whether *the transfer* has occurred. While trust management mechanism with investment obligations may be an alternative means of attracting private capital and expertise, the viability of such approach for water infrastructure sector is yet to be tested.

7.4. Agricultural Clusters

In Uzbekistan, the cluster system was introduced in 2017 with the Resolution of the President of the Republic of Uzbekistan dated 19.05.2017 №PP-2978 "On the creation of a modern textile cluster in Bukhara region", which authorized the creation of FE LLC "BCT cluster".[70] Later in the same year, in accordance with the Resolution of the President of the Republic of Uzbekistan dated 15.09.2017 №PP-3279 "On measures to create a modern cotton-growing and textile cluster in the Syrdarya region" FE LLC "Bek cluster" was created.[71]

Cluster is more of an economic concept (and a status to qualify a commercial entity or a group of entities for certain state support measures) rather than a legal concept. Cluster refers to a production complex, that covers all processes, from the production of raw materials to the delivery of processed finished products to consumers. The legislation defines cotton-textile cluster as "a production complex that includes the cultivation of raw cotton by one or more organizations and (or) purchasing it on the basis of a contract, including deep processing processes based on cooperation with other economic entities".[72] The cluster system was introduced to the Uzbek agricultural production system primarily to create a value chain by private manufacturers by shifting away from pure raw material export oriented system.

Although, clusters may have features of PPPs, they should not be mixed with PPPs. In PPPs, where the underlying philosophy is to address socio-infrastructure needs of the population, the State undertakes certain contractual obligations to perform and bear certain risks, while in clusters, State *may* participate as land lessor (or may not participate if cluster do not lease land from the State) and *may* provide additional support measures.

In terms of water use, clusters (effectively these are commercial entities and mostly in the form of LLCs) are simply water consumers and tax payers. Some analysis in regards to a potential role that clusters may play in providing water infrastructure will be discussed below.

Section 8: Reflections and Proposals

8.1. Challenges and Perspectives

Sustainable infrastructure investments can confer many economic benefits on a country, from boosting growth and creating jobs to promoting sustainable industries and building resilience against climate change and other related disruptions. Delivering this future requires huge investments. For developing countries, especially such as Uzbekistan, public funding alone is not enough.

Box 1: Defining sustainable infrastructure

> Sustainable infrastructure systems are those that are planned, designed, constructed, operated and decommissioned in a manner that ensures economic and financial, social, environmental (including climate resilience), and institutional sustainability over the entire infrastructure life cycle. Sustainable infrastructure can include built infrastructure, natural infrastructure or hybrid infrastructure that contains elements of both.
>
> UN Environmental Programme at https://www.unep.org/explore-topics/green-economy/what-we-do/sustainable-infrastructure-investment

[70] https://lex.uz/ru/docs/4923852
[71] https://lex.uz/ru/docs/3352681
[72] Section 2 of the Regulations on the procedure for organizing the activities of cotton-textile clusters", approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated December 4, 2021 No. 733. Available at: https://lex.uz/ru/docs/5760112

While private-sector investment can play a vital role in filling the gap in funding, to unleash such potential requires viable financial incentives. In other words, without a clearly defined business case, the government cannot attract private sector investments into its public sector. One of the very few public sectors in Uzbekistan that has seen private sector involvement in the recent years is the electricity sector. Supported by the IFIs, the Government has launched ambitious reforms in electricity generation sector. According to the official Government sources, during 2019-2022, the energy sector has seen agreements worth 6 billion 919 million dollars concluded with foreign investors for the construction of thermal, solar and wind power plants in Uzbekistan. Most of these (if not all) projects are implemented through PPP structure, which is built around guaranteed off-take agreement with pre-defined volume of electricity to be supplied to the State. Off-take agreement is a legal mechanism for the investors to ensure that their investment will generate return within certain period of time.

As it was shown above, the Government has been promoting PPP mechanisms in the water sector as well. However, what is lacking is the well-structured business case for the private sector to commit its capital. The water infrastructure is used for handling of water from its natural environment to places where it is needed, be it agricultural land or taps in people's homes. It also deals with the environmental needs and the health of the ecosystems. While the business case for domestic (urban) water supply might be relatively straightforward, it is not the case for irrigation infrastructure. There may be a number of reasons behind the lack of private sector involvement in the irrigation infrastructure. These are:

- High construction costs and poor production performance – most of the irrigation systems are old and in dire conditions.
- Climate change related variability in water flow makes it difficult for the private to create a financial model for investment return.
- Lack of technical expertise and capacity for designing and building systems, efficient operation and maintenance, and innovation and creativity in supplying to the changing demand.
- Politically and socially sensitive nature of the water and irrigation sector, which may pose a challenge to over-commercialization of the sector.
- Low rate in water delivery fee and possible poor recovery rates (from investment perspective).
- Seemingly conflicting policy goals: the water business is based upon the fee paid by the users/consumers for water delivery service. This means the more water is used/consumed, the more in fees paid to the service provider. Such business model can be in conflict with the current policy goal of water efficiency.

Any future policy intervention for enhancing private sector investment in the water sector should be guided by these non-exhaustive list of factors.

8.2. Reflections on the current models and proposals

Privatization

While the ban on privatization of water infrastructure (except large and strategic infrastructures), has been removed from the Water Law, the practical implications of this approach need to be carefully considered. Water is a shared resource and it is a political, social (and spiritual) concept. Privatizing the infrastructure that handles the shared resource for the common use may not go well with the public. Alternatively, collective ownership through the Water Consumer Associations (WCAs) could be a viable option. WCAs, being a legal entity, can own and manage a property. As a non-governmental non-profit organization, WCAs can be engaged in entrepreneurial activities provided the profit from such entrepreneurial activities will go to support its main purpose and related activities. WCA ownership and self-funding (by WCA members) of water infrastructure will create a sense of collective responsibility and social justice. While economically WUAs (and ultimately its members) may not be in a position to self-finance the construction and maintenance of water infrastructure, the Government could perhaps come up with economic models of (partially) supporting such financial models. The financing may also take place through micro-finance loan instruments funded by IFIs and coordinated by local commercial banks. The Government may also coordinate capacity building activities for WCAs to enhance financial, legal and technical capacities related to this financing schemes.

In terms of legal framework, WCA's overall legal and institutional capacity allows them to borrow, own and manage the water infrastructure. A government level decree would suffice to further facilitate and accelerate these transformations.

Public-private partnerships

As discussed above, the PPP is one of the widely used buzz-words in legislative and policy documents, the implementation of which requires rather comprehensive capacity building efforts both amongst public authorities and the private sector. It is a difficult task to create a financial model for water infrastructure PPP due to the lack of consistency in water flows, which is an important element for calculating and generating investment returns.

While the current tendency of PPP projects in water sector mainly involve the exploitation of pump stations, there is no sufficient data available in official government sources explaining the financial and risk allocation structures of such projects. One source claims that joint management agreements have been concluded between the Government and the private sector in the example of BCT cluster in Bukhara province. Accordingly, the state will deliver limited energy for the operation of the pump station and will pay salary for pump operators in the next 10 years. If the energy exceeds the limit for the pump operation, the BCT cluster pays for the additional energy use coupled with the maintenance costs of the pump. The management, operation and maintenance costs of the pump station will be fully covered by the cluster after ten years.[73] While this may not be a rather accurate example for the current PPPs in Uzbekistan's water sector, on the onset if such transactions exist, they are far from how classical well designed PPPs are structured and implemented.

What way forward? The Government should develop a comprehensive and detailed guidance explaining potentially various business models and risk matrix that can be implemented for water sector in general and in irrigation infrastructure in particular, while taking into account all the relevant factors. The Government may also engage IFIs for particularly large infrastructure assets, so that tailored project concepts can be developed. If rightly structured and implemented, PPPs will serve as a viable alternative to public funding through the budget. The Government, as a public duty guardian, will maintain regulatory control and monitoring authority.

On a positive note, the government of Uzbekistan has successfully achieved a commercial closures of a PPP project in transforming a wastewater treatment plant with the support of Asian Development Bank. This project is a pioneer project in Uzbekistan's water and environment sector in terms of its complexity, legal structure and scale, which will be discussed in detail in Annex IV.

Clusters

Clusters have been engaged in water infrastructure financing to some extent, which has been taking place through imposing investment obligations by a legislative act establishing a cluster. This can further be enhanced depending on the size and investment potential of clusters. For example, the Resolution of the Cabinet of Ministers No. 309, dated June 07, 2022 "On measures to establish modern fruit and vegetable agro-industrial clusters in Namangan region" requires the Investor (LLC "Namangan sharbati"), as part of the investment obligations, to dig wells and build a pumping station with the total value of works being at 110 thousand USD. Further upscaling such practices may involve constructing and rehabilitating inter-farm canals, drainage systems and hydraulic systems. While primary beneficiary from these investments may be the clusters but improved and upgraded water infrastructure within the boundary of clusters will have a positive impact on the overall functioning of the system, especially if the infrastructure passes through the cluster territories to neighbouring farms/fields.

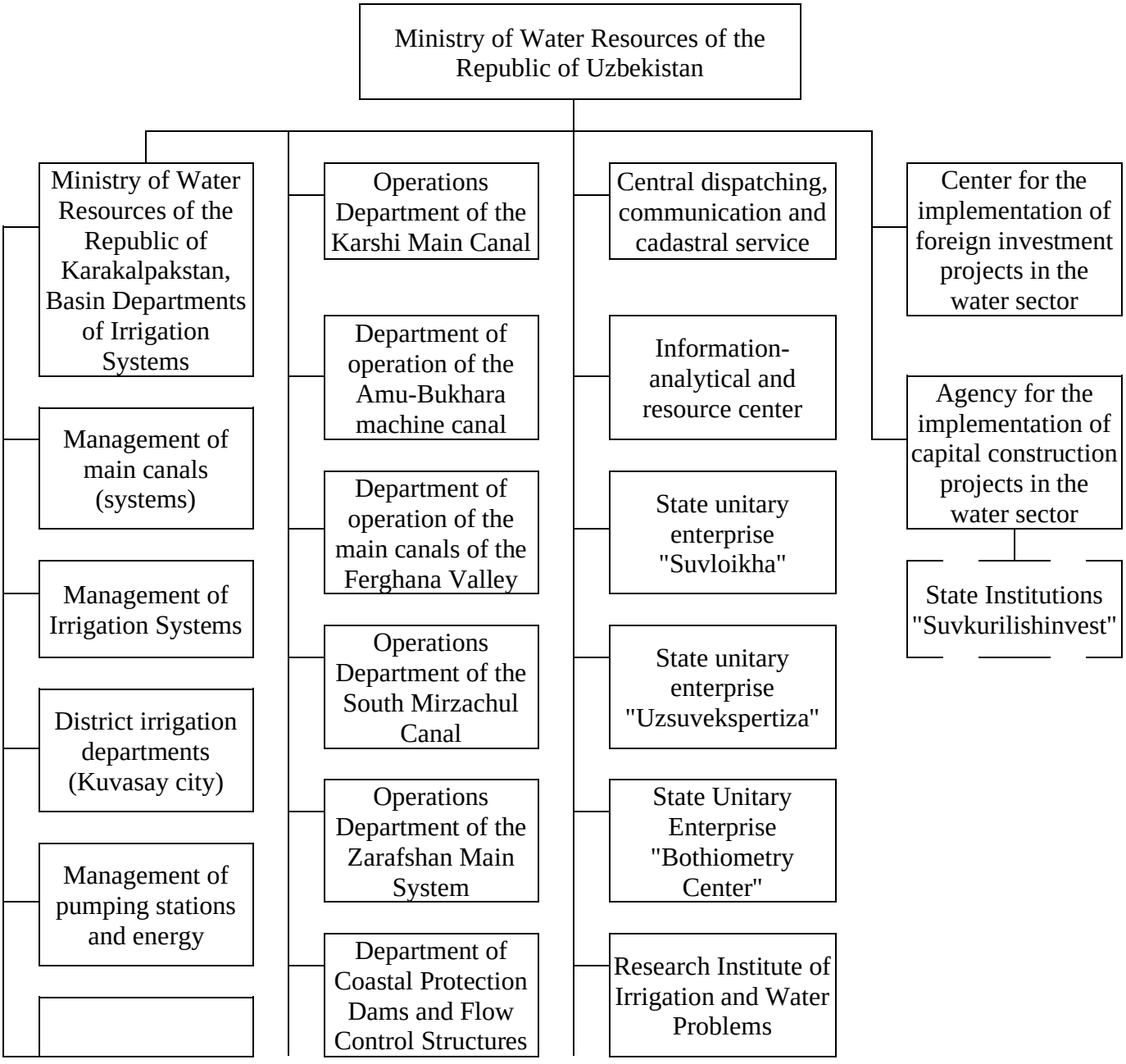
Concluding remarks

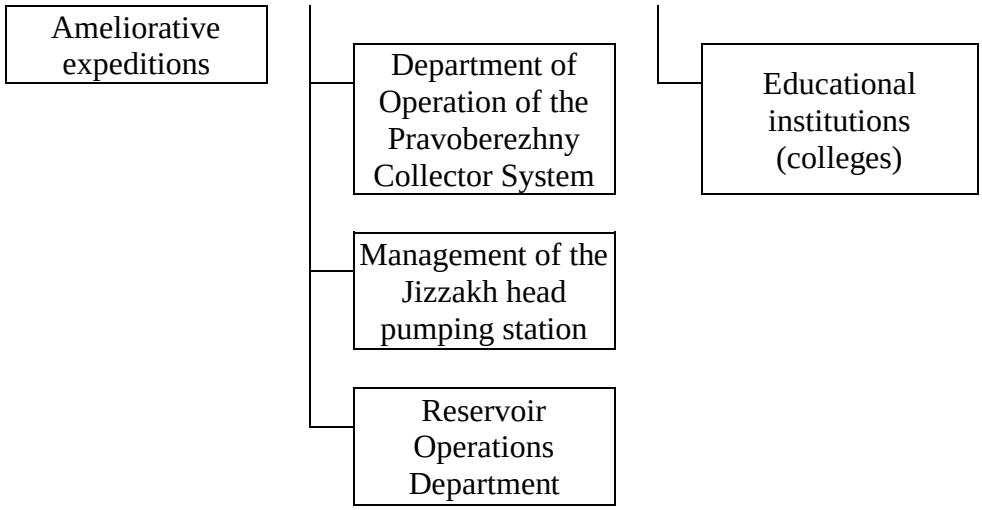
Making a business out of developing, building and improving water infrastructure is not easy. Successful projects will have to migrate from simply selling equipment and constructing facilities to providing solutions. The policy makers and implementers have to develop new skills and capabilities to identify and capture the higher-value-added solutions, while taking into account political, economic, social and climatic conditions. As it was shown, the legal-regulatory framework and political will in Uzbekistan is sufficiently present to facilitate further efforts.

[73] According to Kakhramon Djumaboev, Regional Researcher, International Water Management Institute (personal communication, September 24, 2022)

Now the work needs to be done to engage into active and genuine dialogue with all the relevant stakeholders and define the market for the participation of the private sector in Uzbekistan's water sector.

Annex I: Organizational Structure of the Ministry of Water Resources of the Republic of Uzbekistan





Annex II: Forecast indicators for disbursement of credit funds for projects implemented in the field of water management at the expense of foreign investments for 2021-2023

No.	Project	IFI	Total cost of the project (mln. USD)	Loans (mln. USD)
1.	Project "Improvement of water resources management in Surkhandarya region (restoration of system canal Khazarbog-Okkopchigay)"	Islamic Bank of Development	122,7	89,6
2.	Project "Improvement of Water Resources Management in Southern Karakalpakstan"	World Bank	376,7	214,9
3.	Project "Management of water resources in Fergana Valley. 2nd stage"	World Bank	228,2	144,9
4.	Project "Restoration of the Amu-Bukhara irrigation system"	ADB, JICA	406,3	325,7
5.	Project "Capital reconstruction of the pumping station of Karshi cascade (Phase-III)"	Saudi Fund of Development	105,3	43,2
6.	Project "Modernization of 299 pumping stations"	VEB RF	824	824,0
7.	Project "Modernization and reconstruction of 235 pumping stations"	EBRD	574,4	574,4
8.	Project "Rehabilitation of irrigation and road infrastructure, damaged and resulting irrigation dam Sardoba"	ADB	100	100
9.	Project "Management of water resources in the basin of the Aral Sea with adaptation to climate change"	ADB	150	150
TOTAL:			**2887,6**	**2 466,7**

Annex III: Summary Parameters for Consolidated budget of the Republic of Uzbekistan for 2022 and budget benchmarks for 2023-2024

billion soums

N	Indicators	Forecast for 2022	Budget guidelines	
			2023	2024
I.	**Revenues of the Consolidated Budget**	**254 582.5**	**276 673.9**	**316 482.5**
1.	State budget revenues*	199 500.0	214 529.2	249 319.1
2.	Income of state trust funds*	31,935.9	35,160.2	38,318.4
3.	Receipts to the Fund for Reconstruction and Development of the Republic of Uzbekistan	8495.3	11,312.4	12,389.3
4.	Receipts to off-budget accounts of budgetary organizations	14,651.4	15,672.1	16,455.7
II.	**Consolidated budget expenditures**	**280 128.7**	**304 584.4**	**347 228.6**
1.	State budget expenditures*	188 911.5	202 669.0	238,545.1
2.	Expenditures of state trust funds	58,179.0	62,782.7	67,678.6
3.	Spending funds from the Fund for Reconstruction and Development of the Republic of Uzbekistan	7,727.1	10 112.4	11,117.3
4.	Spending funds from off-budget accounts of budgetary organizations	14,614.5	15,564.4	16,270.0

5.	Spending on government programs at the expense of external debt	10,696.5	13,455.8	13,617.6
III.	Transfers to State targetted funds	25,900.1	28,244.4	30,356.6
IV.	Balance of the Consolidated Budget *(surplus +, deficit -)*	-25,546.1	-27,910.5	-30,746.2
V.	Balance of the State budget and State targetted funds *(surplus +, deficit -)*	-15,654.7	-15,762.3	-18,586.2
VI.	Redemption of the public debt	10,172.3	11,394.3	15,098.9

Source: Appendix No. 1 to the Law of the Republic of Uzbekistan dated December 30, 2021 No. ZRU-742

Annex IV: Sustainable Water Infrastructure Finance Case Study: Namangan Wastewater Treatment Project

General overview

In December 2021, **Metito**, a leading global provider of water and alternative energy management solutions, has been awarded the first public-private partnership (PPP) wastewater treatment project under **design, build, finance, operation, and maintenance** in Uzbekistan. The project will be implemented on the basis of the existing wastewater treatment plant ('WWTP') (built in 1965 and expanded in 1980) with the expected capacity of 100,000 m3/day wastewater treatment, along with the construction of a new 7.5km effluent discharge pipeline in the Namangan District. The project worth **USD 100 million**, is the first wastewater project to be implemented under the PPP Law with **private investment and project financing** undertaken by the Ministry of Housing and Communal Services with the full support of the Government of Uzbekistan.

With a population of 612,000 Namangan City is situated 295km east of Tashkent. The catchment area of Namangan WWTP includes Namangan City, Namangan District and 5 adjoining districts. The project, which marks Metito's first PPP project in Uzbekistan and second in the Commonwealth of Independent States (CIS) region, will rehabilitate and expand the currently dysfunctional and not sustainable water and wastewater plant. The project is set to improve access to safe water and create a more sustainable community and have a huge impact on the Uzbekistan community particularly through encouraging more foreign direct investments into capital-intensive, lifeline infrastructure projects. Furthermore, it can be seen as a part of a large-scale water management strategy that is aimed at the corporatization and the transfer of management of water supply and sewerage systems to private operators.

Legal framework for the project

- PPP Law No-537 (dated 10.05.2019);
- Presidential Decree No. 4040 (dated 30.11.2018) on "Additional Measures on Development of Water Supply and Sanitation System in the Republic of Uzbekistan" to implement "the transfer of water supply and sewage systems in the cities of Samarkand, Bukhara, Namangan and Karshi (the "Four Cities") to private operators under a PPP scheme;

- Presidential Decree No. 4300 (dated 29.04.2019) on "Measures to further improvement of the mechanisms for attracting foreign direct investment in the economy of the Republic" envisages the realization of PPP project in water and wastewater sector in Namangan region.

Parties and risk allocation

Metito will implement project through locally registered project company, SPV – special project company, which acts as a private partner ('**Private Partner'**): The Private Partner is responsible for the engineering, procurement, and construction of the project for the first 2 years as well as its operation and maintenance for 23 years after completion. Overall project period is 25 years. Metito will finance the project through equity (own funds) and project finance debt. The Private Partner will also be responsible the quality of treated water.

Republic of Uzbekistan, represented by the Ministry of Housing and Communal Services of Uzbekistan acts as a public partner ('**Public Partner'**): The Public Partner is responsible to transfer the Namangan WWTP to the private partner and allocate necessary land territories to undertake construction works, including for 7.5km pipeline. For the return of the Private Partner investments, the Public Partner will make payments to the Private Partner through a combination of (i) fixed capacity availability payments; and (ii) variable operating payments based on treated volumes. Overall, payments are designed to cover all fixed and variable operating costs and capital costs of the Private Partner, subject to performance penalties.[74] The Public Partner will also remain responsible for legal-regulatory changes during the term of the project.

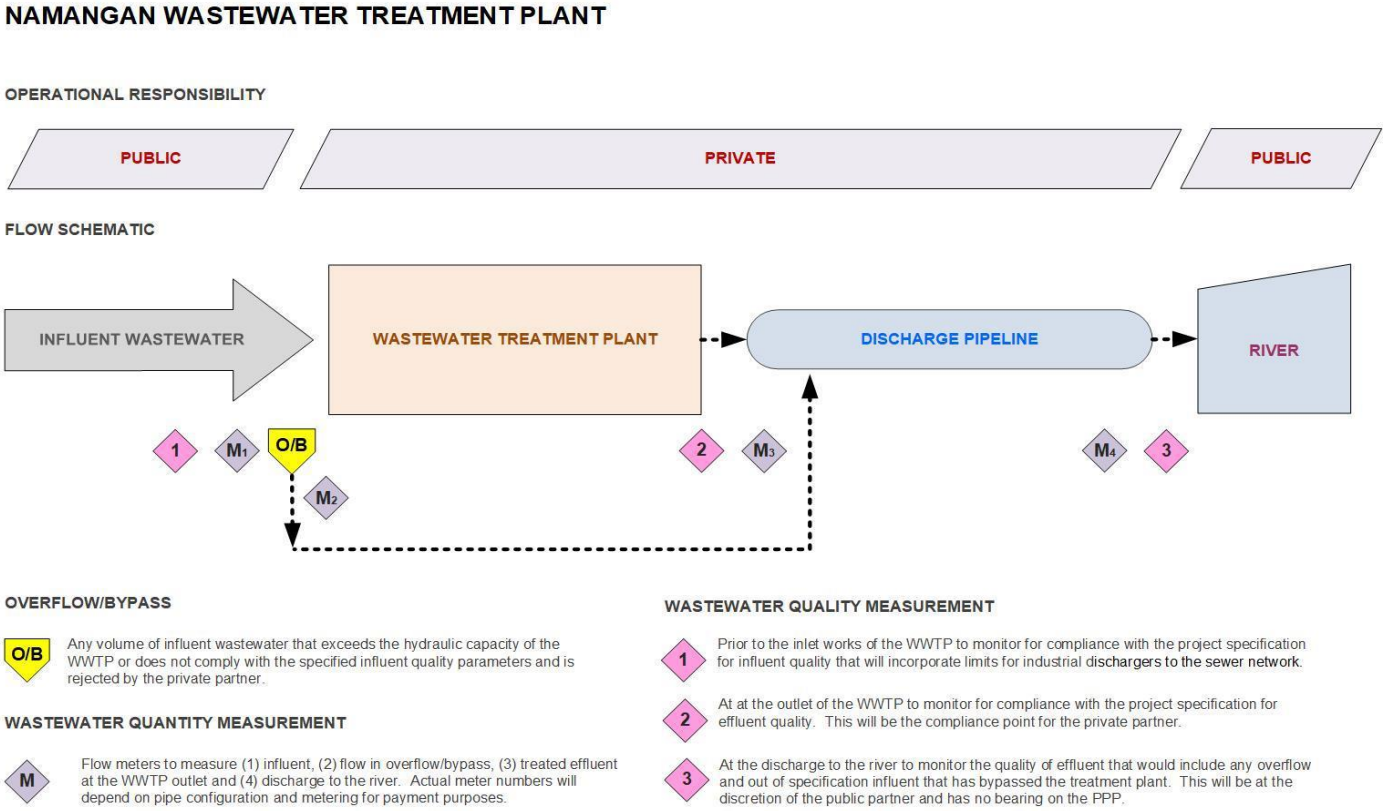
Selection of Private Partner and Project Advisors

The Private was selected following a two-staged (RfQ and RfP) open international tender run by Asian Development Bank ("ADB'), who acted as a transaction advisor to the government of Uzbekistan.[75] ADB was supported by Ardurra International and Spectrum Group as technical advisors and Allen & Over and Kosta Legal as global and local legal advisors, respectively. Initially, 23 foreign companies showed interest in the project, Metito being officially announced as the winning bidder of the Namangan PPP project. The announcement was made at an award ceremony hosted by the Ministry of Housing and Communal Services in the Republic of Uzbekistan, and which was attended by members of the Ministry of Housing and Communal Services, the Ministry of Finance, and their PPP Development Agency, Asian Development Bank, as well as representatives from Metito. Metito's team of advisory included Synergy Consulting (financial advisor), KPMG (tax advisor), Hogan Lovells (legal advisor).

Project schematic structure

[74] Ministry of Housing and Communal Services (August 2020). Retrieved from https://mjko.uz/files/200819UZBNamanganEOI_EN.pdf

[75] As a side note, it is worth to emphasize the role of the IFIs in transforming the infrastructure climate of Uzbekistan. The IFIs have been acting as transaction advisors, coordinating the functions of the government, technical, legal, and financial consultants, as well as boosting the credibility of a given project. The IFIs may also act as lenders through sophisticated debt mechanisms alongside commercial banks. Participation of the IFIs in debt mechanisms is believed to provide an extra comfort to commercial lenders against political risks.



Source: https://mjko.uz/files/200819UZBNamanganEOI_EN.pdf

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