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DECREE**THE PRESIDENT OF THE REPUBLIC OF UZBEKISTAN****ON approval OF THE CONCEPT OF DEVELOPMENT
OF WATER MANAGEMENT SECTOR OF THE REPUBLIC OF UZBEKISTAN FOR 2020-2030**

In order to ensure stable and guaranteed water supply for households, as well as for all sectors of the economy, large-scale efforts are underway in our country to develop irrigation system, improve water management infrastructure and quality of irrigated lands, as well as the efficient and rational use of land and water resources.

At the same time, due to global climate change, continuing growth of the population and increasing demand for water, the shortage of water resources is aggravated from year to year, which may become the main hindering factor for the country's development in the future.

At the same time, absence of a long-term concept for the development of water management sector impedes the efficient use of water resources, widescale channeling of investments in this sector, promoting R&D and innovative potential in water sector, implementation of R&D products know-how, and broad utilization of modern information and communication technologies and innovative solutions.

Based on this, in order to ensure water and food security of the country by organizing effective water resources management and their rational use in the medium- and long-run, reforming the water sector and introducing market principles and mechanisms, information and communication technologies, as well as efficient use R&D potential in the sector.

1. Approve:

The Concept for the Development of Water Resources Sector of the Republic of Uzbekistan for 2020-2030 (hereinafter referred to as the Concept), designed with the participation of international organizations and experts in accordance with Annex No. 1;

The roadmap for the implementation of the tasks specified in the Concept for the Development of Water Resources Sector of Uzbekistan for 2020-2030 (hereinafter referred to as the "Roadmap") in accordance with Annex No. 2.

2. Identify priority areas for the implementation of the Concept:

sustainable and guaranteed water supply to all sectors of the economy in the medium- and long-run, as well as the efficient and rational use of water, enhancing its quality and safety through widescale introduction of the principles of integrated management of all surface, ground and return waters;

further expanding the scale of the use of water-saving irrigation technologies and enhancing the efficiency of water use, further developing the system of state support and incentives for agricultural producers that have introduced water-saving methods and technologies

maintenance of reservoirs, waterworks, canals and collectors, pumping stations and other water facilities, their modernization and enabling technical safety, as well as the designing and implementation of programs aimed at reducing water loss in irrigation systems, across-the-board introduction of energy-saving and energy-efficient technologies;

by improving the reclamation state of irrigated lands, enhancing their fertility, maintaining optimal groundwater levels, introducing effective methods to combat soil salinization; introduction of market principles in the water sector, introduction of public-private partnership and outsourcing mechanisms, as well as enhancing the financial sustainability of the water sector by increasing the share of foreign investment;

improving the system of governance of water sector by optimizing the water management system, formulating and implementing recommendations in accordance with international methods for verification and redistribution of the functions and powers of government agencies involved in the management of water resources of the country and the provision of water supply services;

development of interstate relations on the use of transboundary waters, design and promotion of mutually acceptable mechanisms for joint management of transboundary water resources in the region, promoting balance of interests of Central Asian countries;

widescale implementation of modern information and communication technologies in the sector of water resources management, automation of systemic processes of water management, control and accounting of water resources;

improving the system of training and advanced training for human resources in the water sector, promoting R&D and innovative potential in the water sector, implementation of R&D and know-how, implementation of international standards in the design work in this field.

3. To approve the Coordinating Council for implementation of the Concept for the Development of the Water Sector of Uzbekistan for 2020-2030 (hereinafter referred to as the Coordination Council), composed according to Annex No. 3

Determine the Ministry of Water Resources of the Republic of Uzbekistan as the working body of the Coordination Council.

4. The Coordinating Council (A.N. Aripov) shall:

organize full-fledged, timely and high-quality implementation of the Concept, as well as conduct continuous monitoring of the achievement of established indicators;

within a month, create, for each main area of the Concept, permanent working groups consisting of qualified specialists, including foreign experts, along with establishment of salaries and other payments in the form of grants of international financial organizations, foreign countries and other donors, extrabudgetary funds from the Ministry of Water Resources Republic of Uzbekistan and other sources not prohibited by law.

to ensure high-quality and timely preparation, as well as the introduction in the prescribed manner of draft legal acts aimed at the implementation of the Concept and the Road Map;

quarterly submit information on the efforts made to implement the Concept to the Presidential Administration of the Republic of Uzbekistan;

By September 1, 2020, jointly with the responsible authorities, ensure the formulation of the draft Strategy for water resources management and development of the irrigation sector;

5. Through the implementation of the tasks and activities outlined in the Concept, the Ministry of Water Resources shall ensure the achievement of the following indicators by 2030:

enhancing the efficiency of irrigation systems from 0.63 to 0.73;

reduction of irrigated fields from 560 thousand hectares to 190 thousand hectares;

reduction in the annual electricity use of pumping stations in the system of the Ministry of Water Resources from 8.0 billion kWh to 6.0 billion kWh;

expanding total area covered by water-saving technologies for irrigation of agricultural crops up to 2.0 million hectares, including drip irrigation technology – 500,000 hectares;

reduction in the total area of salinized lands from 1,935,000 hectares to 1,722,000 hectares, medium and highly salinized lands - from 607,000 hectares to 430,000 hectares

increasing the number of water facilities where “Smart Water”, automated system for measuring and controlling water, has been introduced, up to 1000;

automation of water management processes at 100 large water facilities;

implementation of 50 projects in the sector of water management based on the principles of public-private partnership

6. It is understood that the funds saved by phased reduction in energy use by the pumping stations of the Ministry of Water Resources and introduction of the principles of a market economy, outsourcing and public-private partnership mechanisms will be used to modernize water facilities, strengthen infrastructure and gradual increase of the wages of the employees of water organizations.

7. Within one month, the Ministry of Water Resources of the Republic of Uzbekistan shall create a designated department in the structure of the ministry, consisting of 4 additional staff members, as well as to ensure recruitment of foreign experts in order to ensure the full and timely implementation of the tasks specified in this Decree.

It is understood that foreign experts shall be hired at the expense of extrabudgetary funds of the ministry and using grants and technical assistance from international financial institutions.

8. Recommend to the chambers of the Oliy Majlis of the Republic of Uzbekistan:

establishment of parliamentary and public oversight of the timely and effective implementation of the Concept;

quarterly hearing of the progress reports by ministries and agencies as well as the Council of Ministers of the Republic of Karakalpakstan and khokims of regions at sessions of the Senate, the Legislative Chamber and, accordingly, the Jokargy Kenes of the Republic of Karakalpakstan and the Kengashes of People's Deputies of oblasts.

11. The Ministry of Water Resources, jointly with the Ministry of Justice of Uzbekistan, other interested ministries and departments, shall, within two months, submit proposals to the Cabinet of Ministers of the Republic of Uzbekistan on amendments to the legislation arising from this Decree.

12. The National News Agency of Uzbekistan and the National Television and Radio Company of Uzbekistan, together with the Ministry of Water Resources of the Republic of Uzbekistan, shall facilitate broad media coverage of the essence and content, as well as the goals and objectives of this Decree.

13. The oversight of the implementation of this Decree shall be delegated to A.N. Aripov, the Prime Minister of the Republic of Uzbekistan and Z.Sh. Nizomidinov, the head of the Presidential Administration of the Republic of Uzbekistan.

The President

Republic of Uzbekistan

Sh. MIRZIYOEV

WATER SECTOR DEVELOPMENT CONCEPT

OF UZBEKISTAN 2020-2030

CHAPTER 1. GENERAL PROVISIONS

The Water Sector Development Concept of Uzbekistan for the period of 2020-2030 (hereinafter the Concept) was developed pursuant to the Presidential Resolutions No. PP-3437 of December 18, 2017 “On Introduction of New Procedures for Formation and Financing of the State Development Programs of the Republic of Uzbekistan”, No. PP-3672 of April 17, 2018 “On Measures to Organize Operations of the Ministry of Water Resources of the Republic of Uzbekistan” and Presidential Decrees No. UP-4947 of February 7, 2017 “On Action Strategy for Further Development of the Republic of Uzbekistan”, No. UP-5742 of June 17, 2019 “On Measures for Efficient Use of Land and Water Resources in Agriculture” and Presidential Resolution No. PP-4486 of October 9, 2019 “On Measures for Further Improvements in Water Resources Management System”, as well as “Agriculture Development Strategy in Uzbekistan for 2020-2030” adopted in accordance with the Presidential Decree No. UP-5853 of October 23, 2019.

The Concept defines the mid- and long-term goals, objectives, priority areas of water sector development in the Republic of Uzbekistan and is the basis for Water Resource Management and Irrigation Sector Development Strategy and programs aimed at further water sector development.

CHAPTER 2. GOAL AND OBJECTIVES OF WATER SECTOR DEVELOPMENT IN UZBEKISTAN

Water is a vital element in all aspects of social and economic activity, it is the natural resource that benefits households, agricultural producers and all other productive enterprises, it is also important for maintaining the environmental balance.

Uzbekistan is classed by the UN as a “water stressed” country. Its future supply-demand balance will be affected by intensive glacier melt, which forms the main rivers of the region, as well as other climate change aspects, alongside with the growing demands of population for water and industrial growth. It is estimated that 10-20% reduction in water availability would have serious repercussions on the size of the irrigated area and the employed population reducing the gross national income. Therefore, managing water effectively across the demands of irrigated agriculture, municipal and industrial water use, the environment and other uses is critical for ensuring sustainable economic development of the country.

In this context, the goal of water sector development in Uzbekistan is to create conditions for meeting the ever-growing needs of people, economy and environment for water, ensure efficient water resources management and use, ameliorative condition of irrigated lands, and achieve water and food security in the context of the growing water scarcity and global climate change.

In support of the above, the Concept establishes the following objectives:

1. Introduction of integrated water resources management principles (surface, groundwater and return flows), ensuring reliable and secure water supply for the population, economic sectors and environment.
2. Improvement of water sector regulatory framework.
3. Development of a plan for incorporating the national goals and strategies on climate change mitigation and adaptation into water resource planning, development and management.
4. Improvement of water resources projection and accounting system, data quality and availability for efficient decision making.
5. Development of incentives for efficient water use, implementation of energy and water-saving technologies, optimization of water consumption pattern and development of water re-use systems.

6. Gradual reduction in the state operational costs for water facilities and gradual increase in water consumers' share to partially cover the water delivery costs of water management organizations.
7. Improvement of financial sustainability of the water sector through implementation of market principles, commercialization of water management organizations, introduction of outsourcing mechanisms, including public-private partnership.
8. Creation of conditions and incentives for water saving and improving water quality, reduced negative impact of water use and water consumption on water, land resources and environment.
9. Implementation of modern efficient management practices, increased role and participation of water users, water consumers and the public in water resources management.
10. Raising awareness on water management, including water allocation and water use issues among public, water management organizations, farmers, water consumers and investors.
11. Further development of regional cooperation in managing and using transboundary water resources and interstate water management infrastructure.
12. Strengthening capacity of water management organisations at all levels, including public administration reforms aimed at development of institutions capable to ensure sustainable water sector management and efficient service delivery.
13. Modernization and improvement of hydraulic structures and pumping stations to ensure their safe operation, reduced water losses in irrigation systems, and reduced energy costs for water delivery.
14. Improvement of reclamation state of irrigated lands, implementation of efficient soil salinity control practices and sustaining the optimal ground water level.
15. Development of research and innovative water management capacity, application of research and know-how.
16. Widespread use of information and communication technologies and innovative solutions in water sector.
17. Enhanced capacity building of water management organizations including implementation of effective processes and procedures for water management staff training and advanced professional development system.
18. Implementation of the best international standards and norms in planning, engineering and construction of water management facilities, active mobilization of foreign investments, loans and grants.
19. Stabilization of water management situation in the Aral Sea region and taking measures to mitigate negative impact of the Aral Sea drying.
20. Continuation of water sector reform in conjunction with the reforms in other socio-economic sectors of the country.

CHAPTER 3. CURRENT SITUATION IN WATER SECTOR

Uzbekistan's water future will be determined both by its own efforts on managing water resources and by other important factors, such as the intensity of water supply from sources and international cooperation on using the transboundary rivers. Climate change will be an additional factor introducing greater variability in future water supply and water security.

Water availability is diminishing due to lower flows in the main rivers, and the depletion of groundwater aquifers. This calls for greater care and efficient use of water by all sectors, particularly agriculture, municipal and industrial consumers to ensure meeting the demand for water by all sectors and environment in the future. Applying the principles of the integrated water resources management requires managing the interaction of upstream and downstream water users and finding appropriate trade-offs to meet demands of different claimants on water supplies.

The primary responsibility in responding to the call for water savings rests with irrigated agriculture, which uses 90% of the national water resources. There is a considerable scope for greater efficiencies in delivering water to farmers and for them to be more efficient and productive with the use of that water at their farm level. The existing infrastructure is aging and requires modernisation, with high costs of operation and maintenance, including high energy costs involved in pumping for irrigation.

3.1. Water Sources, Availability and Use

Water resources of Uzbekistan are part of the Aral Sea basin. The main water sources of Uzbekistan are the surface flow of Amu Darya and Syr Darya rivers and their tributaries. The total average annual flow of all rivers in the Aral Sea basin is around 116.2 km³/year, of which 67.4% is from the Amu Darya river basin (78.3 km³/year) and 32.6% is from the Syr Darya river basin (37.9 km³/year). Besides, the total groundwater reserves in the Aral Sea basin is 31.17 billion m³, of which 14.7 billion m³ is located in the Amu Darya river basin and 16.4 billion m³ in the Syr Darya river basin.

According to "Conjunctive Use and Protection of Water Resources Scheme of Amu Darya River Basin" and "Conjunctive Use and Protection of Water Resources Scheme of Syr Darya River Basin", the annual water intake limit for Uzbekistan is 64 km³/year. Since the 1980s, the annual water consumption has not ever exceeded this value.

Uzbekistan's average use of water resources over the last years is 51-53 km³/year, which shows a substantial reduction (by 20%) of the allocated water intake due to the natural drop in river flow and water sources affected by climate change, as well as issues related to transboundary water use.

Approximately 80% (about 41 km³/year) of the total water resources used by Uzbekistan falls to the share of the transboundary rivers originated from the neighbouring countries.

The estimated natural fresh and slightly saline groundwater deposits provide a potential yield of 27.6 km³/year (75.6 Mm³/day), however, they are unevenly distributed throughout the country. A lack of an evidence based groundwater management system, unauthorized construction of water intake facilities, intensive and uncontrolled use of groundwater over the last 40-50 years have though resulted in depletion of the groundwater deposits.

The demand of water users is supplied by a combination of surface water (50.9 km³/year), abstraction of groundwater (0.5 km³/year), and the reuse of collector and drainage water (1.6 km³/year).

River water quality is generally considered to be good although there are some concerns about increasing contamination from runoff of agricultural chemicals, pollution from untreated wastewater from populated areas and industries and from the waste of upstream mining operations. At the same time, water quality in the sources remains stable thanks to the measures taken to prevent discharge of pollutants and wastes into rivers, mountain streams and other water sources. In particular, over recent years, in accordance with the governmental decrees, 9 wastewater treatment plants have been reconstructed in the municipal sector, while construction of new and modernization of the existing ones is in progress.

The total irrigated area in Uzbekistan is 4.3 million hectares, and agriculture is the largest water consumer with the water use share of around 90-91%. Agriculture is one of the key leading economy sectors of Uzbekistan. Nearly a half of the country's population lives in the rural area. In 2019, a share of the agriculture in GDP was about 28%.

The second important sector in terms of water consumption is municipal sector (4.5% of the water used). There are 119 cities, 1,064 towns and 11,088 rural villages in the country. Of these, 69 cities (58%), 335 towns (31%) and 2,902 rural villages (26%) are supplied with drinking water from proven groundwater deposits. The remaining settlements are supplied with other water sources (surface water, unproved reserves, wells, water conduits, etc.).

Industry (with the share in GDP of 30% in 2019) accounts for 1.4% of water use, fisheries - 1.2%, thermal power - 0.5%, and other sectors - around 1.0%.

Both industry and energy are actively developing in recent years and their water consumption is constantly growing. Moreover, according to the Law of the Republic of Uzbekistan "On Water and Water Use", the water demand for industry purposes is prioritized and shall be fully satisfied (without limits). It is estimated that the total water consumption for industrial needs (including energy) will increase from 2 km³/year to 3.5 km³/year by 2030.

Fishery is another rapidly developing sector. In total, over 3,600 fish farms operate in the country, and the total area of their reservoirs used for fish farming is more than 595,000 hectares. The volume of water consumption by pond farms in the country was 608 million m³ in 2018. Fresh river water is traditionally used for fish farming in Uzbekistan. However, in recent years, due to water deficit, some fisheries located in river valleys had to use brackish wastewater. In 2018, about 116,000 tons of fish were

produced in Uzbekistan.

3.2. Specific Features of Water Management Infrastructure

“Primary soil salinization” caused by both natural conditions (insufficient natural drainage, saline groundwater etc.), as well as “secondary salinization of the irrigated soils” due to the man-made impact (wasteful use of water resources, excessive irrigation of fields etc.) are two critical factors strongly affecting the water management system. As a result, more than 45.7% of the irrigated lands are saline either to a greater or lesser degree.

Other specific features of Uzbekistan’s water sector relate to relatively uneven distribution of water resources throughout the country and complex (high-relief) topography of the irrigated lands that require extensive pumped water supply to the irrigated areas. Pumping stations and pump units supply water to around 60% of the irrigated land in the country.

A complex water management system has been built in the country, which includes canals, drains, pumping stations, reservoirs, headworks and other hydraulic structures to provide water for agriculture and other sectors of the economy.

The total length of the main and inter-farm irrigation network is 28,94 km, farm and on-farm networks[1] comprise 155,000 km.

More than 54,000 hydraulic structures are operated on the main and inter-farm canals; and 114,000 structures are operated on farm and on-farm network.

More than 12,400 wells are used for groundwater intake, including 4,069 wells being operated by the Ministry of Water Resources (MoWR), the other are operated by individual entities and population. Also, there are 56 water reservoirs and 13 mudflow reservoirs (debris basins) are operated in the country to increase water availability, and their total storage capacity is more than 20 billion m³.

The total length of drainage network in the country is 142,800 km, of which 106,100 km are open drains; and 36,700 km are closed (subsoil) horizontal drains.

The MoWR also manages 172 ameliorative pumping stations, 3,788 vertical drainage wells and 27,648 observation wells to ensure favourable soil reclamation condition of the irrigated lands and maintain the groundwater level.

For irrigation purposes, 1,687 pumping stations are operated in the country, which are under responsibility of the MoWR, where more than 5,285 pump units have annual power consumption of 8.0 billion kW/h. Also, more than 10,280 pumping units are operated on the on-farm irrigation networks.

Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIAME) is the education establishment for preparing specialists for the national water sector. Education was also commenced in Bukhara and Karshi branches of the Institute. Water management specialists are also partially trained at the Karshi Engineering and Economic Institute, as well as at the Karakalpak and Andijan branches of the Tashkent State Agrarian University.

The research capacity of water management is represented by such centres of excellence and higher specialized education facilities as TIAME, Research Institute of Water Problems and Irrigation, Hidroingeo, NUUZ, TSTU, TashGAU, UzGIP, Research Hydrometeorology Institute, etc.

3.3. Water Sector Management

According to the Law of Uzbekistan "On Water and Water Use", the public governance in the field of water use is carried out by the Cabinet of Ministers of Uzbekistan, local government authorities, as well as designated state bodies regulating water use directly or through basin (territorial) administrations and other government bodies.

The designated state bodies in the field of water use regulation are as follows (within their mandates):

- Ministry of Water Resources of Uzbekistan (surface water);
- State Committee of Uzbekistan for Geology and Mineral Resources (groundwater);
- State Inspectorate for Supervision of Geological Subsoil Research, Safety in Industry, Mining and Public Utilities Sector under the Cabinet of Ministers of Uzbekistan (thermal and mineral water).

The state supervision over the water use and protection is carried out by:

- Local government authorities;
- State Committee of Uzbekistan on Ecology and Environmental Protection;
- State Inspectorate for Supervision of Geological Subsoil Research, Safety in Industry, Mining and Public Utilities Sector under the Cabinet of Ministers of Uzbekistan;
- Ministry of Health of Uzbekistan;
- Ministry of Water Resources of Uzbekistan.

Department-level control over the water use is carried out by the bodies under the State Committee of Uzbekistan for Geology and Mineral Resources.

Irrigation and drainage systems are managed by the Ministry of Water Resources of Uzbekistan and its subordinate organizations. The Ministry is a governmental body responsible for the overall unified policy in the field of water resources management, as well as coordinating of state bodies, economic management bodies and other organizations in the field of efficient use and protection of water, prevention and elimination of harmful water impacts.

Currently, the MoWR has the following subordinate organizations: Ministry of Water Resources of the Republic of Karakalpakstan, 12 Basin Administrations of Irrigation Systems, 53 Administrations of Irrigation Systems and Main Canals, 152 District Irrigation Departments (DID), 14 Pumping Stations and Energy Departments, 13 Hydromeliorative Expeditions, and others.

Along with the above-mentioned bodies and state authorities, there are other ministries and departments involved in making decisions and endorsements regarding water distribution and use: Ministry of Agriculture, Ministry of Housing and Communal Services, Ministry of Energy, UzHydromet. The Inspectorate for Agricultural Complex Monitoring under the Cabinet of Ministers of Uzbekistan is responsible for compliance monitoring of water legislation.

In recent years, in consequence of large-scale institutional reforms carried out in the country, a number of measures have been taken to enhance effectiveness of state governance in the water sector, to improve the principles and systems of water resources management. Consistent efforts are underway to improve soil reclamation state of the irrigated lands, respond to the needs of the changing agricultural sector, increase efficiency and productivity of water use, improve the system of water accounting, strengthening financial sustainability and technical capacity of water management organizations.

In particular, in accordance with Presidential Decree No. 5418 dated April 17, 2018, the Ministry of Water Resources of Uzbekistan was established. The priority areas and key performance indicators for the MoWR’s management by the end of 2022 were outlined in the Presidential Decree No. 4486 dated October 9, 2019. Uzsvukurilish JSC, and other state unitary enterprises operating within the ministry framework were transformed into limited liability companies, contract-based works are gradually withdrawn from the ministry system, etc.

Currently, agricultural clusters are actively created in the country, some of which have taken own responsibility for managing water resources within their areas. In this regard, it is important to create new mechanisms to ensure operation and maintenance of farm and on-farm irrigation and drainage networks.

The prospects for water availability in the country and the scope of the future tasks necessitate further deepening of reforms in the water sector and improvements of the water infrastructure based on modern governance methods in this area.

It should also be taken into account that Uzbekistan has committed towards the Sustainable Development Goals, some of which are related to water management.

In particular **SDG 6** assumes the following: Ensure availability and sustainable management of water and sanitation for all. It has the following tasks:

Task 6.1. By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

Task 6.2. By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

Task 6.3. By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

Task 6.4. By 2030, substantially increase water-use efficiency across all sectors.

Task 6.5. By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

Task 6.6. By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

Task 6.b. Support and strengthen the participation of local communities in improving water and sanitation management.

CHAPTER 4. KEY ISSUES AND CHALLENGES OF WATER MANAGEMENT

The key medium and long term challenges of water sector are reducing water availability due to climate change, and increasing water demand due to population growth and intensive economic growth.

The key issue of water management system is inefficient water use during water conveyance and use in agriculture. This issue has institutional, technological and capacity grounds.

Radical changes in agricultural policies towards will have significant implications for the way of how water is managed in Uzbekistan. Gradual phasing out of state order for cotton and wheat production and adoption of market mechanisms through related reforms in the agricultural sector are the key areas for changes in this direction. They require the water resources management to be adapted to the new water use model, which will be evolving as long as the reform is implemented.

Water management institutions, working practices and skills will need to adapt to the new challenges of achieving water and food security. These require changes in managing and allocating water resources and creating infrastructure and services that are more efficiently delivered and more responsive to demand. Research, capacity development, training, acquisition of key skills, and retention of experienced staff will all be important for water management to play their part in the country's economic growth.

4.1. Climate Challenges for Water Management and Transboundary Relations

Today, water management in Uzbekistan faces new challenges related to water and food security. These are: climate change, increased demand for food as a result of growth and increased real income of population, development of industry and urbanization, all requiring additional water resources.

The main challenge is climate change, quite visible by now, such as growth of overall ambient air temperature, especially in hot periods of the year, increased frequency of dry years, floods and mudflows due to higher intensity of storm rainfall in certain periods, and other natural phenomena.

Climate change poses a threat to Uzbekistan, the same as to Central Asia, first of all due to melting of mountain glaciers, which feed the region's main rivers. Over the last 50-60 years, glacier areas have shrunk by about 30%. According to projections, with a temperature raise of 2°C, glaciers could lose up to 50% of their volume and by 4°C this value increases to 78%. Such shrinking of the glaciers will cause substantial freshwater shortage. According to some estimates, by 2050, the flow in Syr Darya river basin is expected to be reduced by 5% and in Amu Darya river basin by 15%. In 2015, the total water shortage in Uzbekistan had already exceeded 3 km³. By 2030 it could be up to 7 km³, and by 2050 up to 15 km³/year.

Some assessment made using global climate models prove that the climate change will aggravate water scarcity in Uzbekistan and will result in increased duration and frequency of droughts, as it has been observed in 2000, 2008, 2011, 2014 and 2018. In dry years, meeting water demand for economy needs could be critical for the country.

The situation with water shortage is aggravated by the fact that Uzbekistan is highly dependent on water coming from the neighbouring countries, (as noted above, 80% of water is supplied from abroad). Therefore, Uzbekistan is establishing water relations with its neighbours both at multilateral and bilateral levels – under bilateral commissions and working groups on shared water use issues.

In recent years, water relations between the countries of the region have been substantially improved; a positive trend is observed towards resolving transboundary water use challenges. However, future construction of new large hydropower facilities and reservoirs in the upper reaches of the Amu Darya and Syr Darya rivers, as well as the water-energy nexus in terms of their energy mode operation, may cause a number of problems for water availability in the Central Asian region, including Uzbekistan.

At the same time, taking into account the virtually complete utilization of the existing water resources formed in the Central Asian region, development of new large land areas in the Amu Darya and Syr Darya river basins and additional water diversion for their irrigation could upset the water distribution balance between the countries of the region.

However, it should be noted that the regional legislative framework on water resource use in the Aral Sea basin still needs to be improved.

4.2. Institutional Issues of Water Sector

The key institutional issues of the water sector in Uzbekistan are the lack of effective incentives for efficient water use by the water users (primarily the agricultural producers but also population), persons and entities responsible for water infrastructure, and insufficient financial support of the water sector. Water users, water consumers and the public do not effectively participate in water resources management, do not have free access to data on water use.

Administrative (non-market) methods prevail in the water management system for crop production sector and agriculture as a whole. The main water allocation tools are often discretionary decided water quotas and administrative control of crop pattern. The objectives of fulfilling plans on cotton and wheat production were not linked with the crop optimization tasks with the view of maximizing economic benefits, increasing incomes of agricultural producers, saving water, and reducing water delivery costs.

The major costs of water delivery to agricultural producers are covered by the state budget. Payments of agricultural producers for water delivery services are not directly linked to the volume of water they consume. The payments are not sufficient to encourage productive and efficient water use.

Management of the main and inter-farm infrastructure is carried out mainly by the MoWR entities and is financed by the state budget. There are no proper incentives in these entities to implement water and energy-saving technologies, save costs of maintaining and upgrading the infrastructure. A practice of public-private partnerships has not yet been properly applied in the sector.

Water Consumer Associations (WCAs) designed for efficient on-farm water management and allocation have never become sustainable self-management units of water users.

Due to inefficient WCA activity, the technical condition of on-farm irrigation networks and hydraulic structures have deteriorated, good-quality water management services have not been provided to farms and other agricultural enterprises, and there has been accruals in WCA accounts payable and receivable.[2]

Another institutional problem requiring appropriate attention is treatment and use of return flow (collector-drainage and waste water). Around half of the water withdrawn by industrial enterprises is returned in the form of industrial effluents posing a threat to the environment.

Despite the fact that the MoWR is a state body implementing a single policy on water resources management in the country, at present, responsibility for water resources is split among several ministries and departments, thus leading to inefficient water use. A number of IWRM development and implementation in country remain to be in the area of responsibility of other state agencies. There is a lack of coordination among agencies working in the water sector. More integrated planning and coordination would be beneficial for improved water security and help achieving sustainability of water sector development.

The main legislative act regulating water relations in Uzbekistan is the Law "On Water and Water Use" adopted in 1993, and substantially amended in 2009. However, development of many legal arrangements for water sector is delayed, there are inconsistencies in the existing regulations, and in many instances the Law itself required improvements.

In this regard, adoption of the Water Code is of great importance for regulating relations in the field of water use.

4.3. Technological Issues of Water Management

Technological problems of water use are primarily associated with outdated and worn out infrastructure, and slow implementation of modern water management and water use systems. Deterioration of the irrigation systems and hydraulic structures being operated for decades, high energy intensity and low performance of process equipment and units result in substantial non-revenue water losses and high conveyance costs.

The total length of main and inter-farm canals in the country is 28,400 km, of which 66% do not have watertight protection, in other words they are earth canals. Of the total length of 155,000 km of farm and on-farm network, only 18,100 km or 12.1% are flumes and 14,400 km are lined canals, while the rest are earth canals.

Moreover, 12,000 km or 44% of main and inter-farm canals require repair and rehabilitation, 4,500 km or 16% are to be reconstructed, and 65,200 km, or 42% of farm and on-farm network, which is under responsibility of WCAs and farms, require repair and rehabilitation, and more than 10% should be reconstructed.

A significant part of the existing flume network has been used for more than 30 years with limited maintenance and therefore, technical condition of 70% of the flume network is considered as unsatisfactory, and also requires their reconstruction and replacement.

In such situation, around 35-40% of water taken from the sources with pumps or by gravity is lost from the irrigation systems (networks).^[3]

In addition, the bulk of the hydraulic structures in the water management system are physically worn out and obsolete. Hydro-mechanical equipment of 18 out of 42 existing headworks (with flow capacity of more than 100 m³/s) need to be replaced or modernized, while 5 headworks require a complete reconstruction.

More than 60% of pumping equipment, which is under responsibility of the MoWR have exceeded their lifespan. Both physical and moral deterioration of pumping stations and their components (pumping units, motors and electrical parts) are also becoming the main reason for large power losses. Almost 80% of large, 50% of medium and 30% of small pumping stations under the MoWR were built more than 30 years ago. Today, those pumping stations are mainly maintained only with frequent and costly repairs. Around 10% (or 300 km) of the existing pressurized pipelines going from the pumping stations, require urgent replacement.

Some consistent measures aimed at improving the amelioration state of irrigated lands and rational water use have contributed to higher productivity of land and water resources, as well as agricultural production in the country as a whole over the past few years. Still, despite the measures taken, poor drainage state of the irrigated lands is the key constraining factor for the crop yield growth. Currently, 1,935,000 ha of the irrigated land are saline to a varying degree, of which 520,000 ha are moderately saline, and 87,600 ha are highly saline. In particular, 14,500 km of drainage networks, 93 reclamation pumping stations and 1,530 vertical drainage wells require rehabilitation and construction.

Frequent dry periods in recent years and disabled major part of farm and on-farm irrigation network have resulted in deterioration of the irrigated lands and, consequently, phasing them out of agricultural production. Since 1990, throughout the country more than 298,500 ha of the irrigated land have been abandoned from agricultural production. Currently, the government undertakes certain measures on recommissioning the abandoned lands. However, considering that agriculture highly depends on irrigation, the situation may further worsen with increased aridity due to climate change and on-going inefficient irrigation practices.

Inefficient water use occurs after water is delivered to water consumers. So far, water saving technologies have been introduced on 3.0% of the irrigated lands only.^[4]

One of the important reasons for poor development of water management system is the low technical capacity of water management organizations (WMOs).

At present, the financial and technical capacity of all WMOs under the MoWR, including the District Irrigation Departments, can be assessed as underdeveloped: there is a lack of irrigation and drainage machinery; extremely poor situation is with modern production, transport, laboratory, information, communication and office equipment is recorded.

The issues of water accounting and its equipping are also relevant. The most serious bottleneck remains to be in water accounting at the lowest level, especially at the interface of water consumers. There are 18,142 gauging stations on the MoWR's balance, of which 9,528 or 52.5% require repair, 1,879, or 10.4%, require reconstruction. Besides, there are 41,130 gauging stations on the on-farm irrigation networks, of which 17,955 (43%) require repair, and 2,380 (about 6%) should be reconstructed.

Over the recent years, significant activity has been implemented to provide safe drinking water to the population, primarily in the rural areas. Projects on construction and reconstruction of water supply and sewer networks are going on in a consistent manner. However, despite the measures taken, certain issues in the field of water supply and sanitation still remain. A set of measures to address these issues is provided for in the Presidential Decree No. PP-4040 "On additional measures for development of water supply and sanitation sector in Uzbekistan" dated November 30, 2018, and also in the Presidential Decree No. UP-5883 "On measures to improve water resources management in Uzbekistan to expand water supply coverage and water quality" dated November 26, 2019.

4.4. Key Staffing and Research Issues of Water Management

The national water management organizations are affected by a shortage of qualified personnel. The integration level in the framework of "higher education-research-production" remains to be low. Training and laboratory facilities of educational institutions need upgrading and modernization in moral and physical terms. Innovative and interactive teaching and learning tools are underutilized. There is a need to implement continuous advanced development of research and professional capacity of faculties. The only exception is the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIAME), one of the leading universities in Central Asia, which is widely known in the CIS as the first-class academic and research institute where systematic works have been carried out in recent times. Nevertheless, other measures should be continued and strengthened to turn the TIAME into a prestigious modern university of the international level.

The average monthly salary of WMO staff remains low (UZS 1,495,000) relative to the average monthly salary in the country (UZS 2,320,000). This low salary level leads to a lower social status and attractiveness of the water related professions and constrains retention of high-performing staff. Young and talented people prefer other more prestigious specialties, while the existing good experts opt to moving to other industries.

Currently, there are no permanently functioning and structured system of advanced training for specialists and managerial staff in water sector. It should also be noted that some work has been carried out in this area recently. For example, under the leadership of the MoWR, short-term courses were organized as part of various projects that covered individual groups of sector experts. Nonetheless, short-term and fragmented courses, periodically conducted within the frameworks of various projects and in the absence of modern working procedures and systems do not bring the desired outcomes.

The lack of coordination in the field of research and development, as well as the lack of funding support of research and innovative activities, fragmentation and insufficiency of such specialized institutions do not allow for the effective uptake of targeted research and innovations in the water sector. Such important areas of research as virtual modelling, GIS technology, engineering solutions and design engineering of water facilities, effective materials and water saving irrigation systems, anti-filtration soil coatings, development of water consumption algorithms considering climate change, water accounting, and evidence based support of major development projects, etc., have not yet been properly rolled out and implemented in the water sector.

CHAPTER 5. PRIORITY DEVELOPMENT AREAS IN WATER MANAGEMENT OF UZBEKISTAN

In view of the above goal and objectives, the water sector development will be focused on the following priority areas:

1. Adoption of Market Principles, Improved Water Sector Regulation and Financing Mechanisms
2. Improved Water Policy and Water Management Mechanisms
 - Infrastructure Modernization and Development of Service Delivery in Water Sector
3. Strengthened Professional, Research and Innovative Capacity in Water Sector

These areas are discussed in detail in the following sections.

5.1. Adoption of Market Principles, Improved Water Sector

Regulation and Financing Mechanisms

Adoption of market principles and efficient regulation mechanisms for water resource management, water delivery and water use will facilitate achievement of the objectives related to raising water productivity across all economic sectors, conservation of the water environment, water saving, reducing costs for operation of water assets, increasing investment attractiveness of the sector and progressive reduction of public costs on infrastructure operation and maintenance. The main tools of stage governance in water allocation and management are:

- Principles of water allocation between economic, social and environment sectors through quotas (limits) allocation (please see Section 5.2 for more details);
- Taxation and penalizing system for using water;
- Water delivery charges;
- State expenditures for operation and modernization of irrigation assets;
- State subsidies and tax exemptions in water sector;
- Transfer of economic functions in the areas of management and maintenance of water infrastructure to the third parties under public-private partnerships (PPP) and other forms of outsourcing.

5.1.1 Improvement of Budget Financing Efficiency; Mobilization of Private, Including Foreign Investments in Water Sector

Moving towards financial sustainability and improving the financial support system for the water sector will be based on the following elements:

- Development of the State Investment Plan to target investments to the highest priority projects on irrigation modernization projects to ensure their efficient operation, reducing non-revenue losses and water delivery costs;
- Increased non-state funding of the sector by means of stage-wise transition to charged irrigation services in agriculture, transfer of economic functions on managing inter-farm level of water infrastructure to outsourcing/non-state organizations, including through PPP and other mechanisms;
- Increased financing of investments in the sector through attracting private investments, including foreign ones, loans and grants from International Financial Institutions and foreign countries;
- Increased expenditures on construction of water management facilities and their modernization, research & development and implementation of advanced technologies.
- Increased competitiveness of staff remuneration in state water management organizations by bringing it to the national average level;
- Ensuring labour remuneration to be performance based of the employees for increasing the efficiency of their work, and attracting and retaining qualified professionals in the sector;
- Improved financing mechanisms and self-financing of water management organizations, efficient use of both assets and lands of the water fund on the MoWR's balance;
- Improved system of planning, use and monitoring of financial flows of state water management organizations and financial flow automation using modern information and communication technologies;
- Improved financing system and promotion of applied research & development in the field of water management.

5.1.2. Outsourcing and Public-Private Partnership Principles in Water Management

To improve efficiency of the water sector and to introduce market principles and commercial practices, the following improvements in water management system are envisaged:

- Partial transfer of water management functions to water consumers (farmer associations, WCAs, clusters, etc.) according to the well-defined criteria and guidelines encompassing clear split of responsibilities, economic efficiency, social equity and environmental sustainability;
- Wider introduction of PPP and other outsourcing principles into the water management system.

PPP principles suppose long-term contractual partnerships between public water utilities and the private sector aimed at development, implementation and financing of water infrastructure projects that are currently managed by the public sector and financed by the state budget.

It is planned to transfer to outsourcing (with a possibility of transferring the existing utilities to trust and other forms of property management):

- Operation and maintenance of water assets;
- Rehabilitation, construction and modernization of water assets;
- Other water sector related services.

The transfer of assets and services to public and private partnership should be carried out exclusively on a competitive basis under transparent procedures.

Decentralization of water system management, including outsourcing and PPP mechanisms, has the potential to increase water efficiency through water delivery cost reduction, increased water productivity and use, which will be achieved through optimization of production processes, implementation of modern technologies and creating incentives for efficient water use.

5.1.3. Improved Management of On-farm Irrigation and Drainage Networks

Taking into account diverse agricultural practices in Uzbekistan, the system will move from attempts to create a universal model for managing on-farm irrigation and drainage networks towards a range of more flexible and diverse mechanisms.

Depending on characteristics of the territory, staff capacity of water management organizations and willingness of private sector to take part in public-private partnerships, it is planned to transfer functions of irrigation and drainage network management to the following:

- voluntary associations of agricultural producers and other water consumers;
- private companies (on a competitive basis);
- agricultural clusters (where they are ready to take such responsibility).

The efforts will also be continued on development and implementation of land and water management practices for the best and most effective control of soil salinity, land reclamation, improved water quality in the lower reaches of the rivers and reduced cost of drainage system operation and maintenance.

5.1.4. Stage-Wise Increase in Water Delivery Cost Recovery by Water Users

A fundamental basis for the transition of water management towards market relations is the implementation of irrigation services charges in agriculture, as well as the improvement of water pricing mechanisms for water delivery services in other spheres. At the main system level this will be achieved through increasing and differentiation of the water tax rates. At the level of local networks, the increased participation of water consumers in financing will be achieved through improved payment mechanisms for water delivery.

The basic principles of transition to charged water delivery services are:

- Cost recovery of water delivery by water users (fully or partially);
- Tariffs should stimulate water saving and be based on volumetric metering of water delivered;
- Tariffs should be differentiated reflecting water delivery costs and national social and economic policy priorities.

The tariffs will be determined based on the average water delivery costs to various territories (electricity costs for water pumping, operation and maintenance of canals, etc.). At the same time, the basic element of the tariff will be equal for all agricultural producers.

Water delivery pricing should be transparent and cover (but not necessarily included in the final price for the water consumer) all infrastructure related costs, including capital, operating and administrative costs, as well as costs related to the future water delivery infrastructure modernization. Water accounting and billing mechanisms should provide clear information to water consumers in a way that positively affects their behaviour.

In case of including the water delivery costs in the water tax, a methodology for calculating differentiated water tax rates will have to be developed and approved, depending on the volume of water consumption and delivery costs.

Adoption of charged mechanisms for water delivery services in agriculture should be phased and closely linked with the ongoing agricultural reform. Nothing else but achievement of financial sustainability of agricultural producers will enable creating the basis for a full-fledged system for covering water delivery costs by water consumers.

5.1.5. Optimization of Water Use and Conservation through Taxes and Penalties

An important tool for water policy implementation is the water tax for efficient water use and penalties for water pollution and overuse. Improvement of taxation and penalty system will contribute to more efficient water use and improved water quality.

In this regard, it is planned to improve a methodology for calculating tax and fine rates for different categories of water consumers taking into account their industry and technological specifics and the quality of return flow, including water salinity and other contaminants.

5.2. Improved Water Policy and Water Management Mechanisms

Improved performance of water management organizations is the key to ensure better water management practices and provision of water services. Effective water allocation planning and management facilitate improved water use productivity and reduced excessive water use, raises the resilience of the system to climate variability and provides greater certainty among water users, thus allowing for better risk management, and increasing investment attractiveness of the water sector.

5.2.1. Improved State Regulation in Water Sector

The water management system requires continued reform based on the following principles:

- Clearly defined roles, functions and authority of each state body that will improve mechanisms of water policy development and implementation, greater coordination between different bodies at making sector related decision and help avoiding duplication of their functions and mandates.

To improve performance of state regulation and prevent conflict of interest at decision making it is required to ensure clear delineation of the functions related to: (i) development and enforcement of a policy for managing all types of water resources, including surface, groundwater and return flow; (ii) regulation of water allocation and use in various sectors (agriculture, public utilities, industry, energy, etc.); (iii) functions of operating the water management infrastructure and provision of water services; (iv) compliance control over water limits, as well as procedure and rules of water use and water consumption.

The transition from administrative methods of state regulation towards methods and mechanisms aimed at market economy principles, including development of economic incentives for efficient water use, revival of private initiatives and attracting non-state financial resources to the sector.

The Concept proposes reforms in the water management system in the following areas:

- Development and enforcement of recommendations (based on a functional analysis in accordance with international methodology) on optimizing the water sector of Uzbekistan, define and redistribute functions and authority of state bodies involved in national water resources management and water delivery services;
- Establishment of a single state body to be responsible for development and enforcement of the national water management policy, including surface, groundwater and return flow, but without economic functions - the Ministry of Water Resources;
- Establishment of an agency under the ministry to be responsible for operation and development of irrigation and drainage system and water supply to various sectors, including agriculture - the Irrigation and Land Reclamation Agency;
- Establishment of an inspectorate under the ministry to be responsible for compliance control of water limits as well as procedure and rules of water use and water consumption.
- Improving operation of other working bodies responsible for the water policy;
- Establishment of public consultation bodies (councils) on water management issues at the national, regional and basin levels with participation of water consumers, experts and civil society.

5.2.2. Development and Implementation of Integrated Water Resources Management Principles

To ensure the wider implementation of water resources management principles (IWRM) in Uzbekistan, the following measures are planned:

- Establishment of a National Centre under the Ministry of Water Resources for water accounting, planning and integrated management of all water resources, including surface, groundwater and return flow, and implementation of appropriate arrangements for coordination with relevant basin and district level organizations;
- Improving the system of water planning and management, taking into account the growing demand for water, requirements of market economy, a need to ensure environmental concerns and environmental balance, and climate change impacts;
- Development and implementation of an Action Program for actual implementation of IWRM principles, including through mobilization of technical assistance from international financial institutions and other development partners.

5.2.3. Strengthening Legal Framework in Water Sector

Considering the realities and ongoing reforms in the country, it is crucial to improve the existing legislation and codify the existing legal norms regarding water and water use ensuring consistency with legislation in the field of agriculture, environment, public utilities and industry. In particular, it is envisaged to:

- By the end of 2020, make amendments and additions to the Law of Uzbekistan "On Water and Water Use";
- In 2022, draft the "Water Code of Uzbekistan", which will codify all the norms of the existing legislation related to water delivery, water use and water consumption;
- Ensure further improvement of the regulatory framework aimed at reforming and implementing the goals and objectives of water sector development consistent with IWRM principles.

Adoption of new modern water legislation will ensure development of the required regulatory framework to streamline future water policies and implement integrated water resources management, as well as will provide a legal framework for proper implementation of the main provisions set forth in this Concept.

5.2.4. Development of Interstate Relations on Using Transboundary Water Resources

To improve and ensure further development of interstate cooperation in using transboundary water resources in the region, the following measures are envisaged:

- Continuation of active cooperation and interaction of Uzbekistan with the Aral Sea basin countries and regional interstate water management organizations on sharing water resources in the region and interstate water facilities;
- Development and promotion of mutually acceptable mechanisms for shared transboundary water management in the region, while ensuring the balance of interests among the Central Asian countries;
- Promotion of norms and principles set by the UN Conventions on Transboundary Water Courses (1992 or 1997);
- Establishment of a joint monitoring and open data sharing mechanism to encourage compliance with the existing international legal agreements, including development of a program to improve accuracy of water metering on the rivers – Syr Darya and Amu Darya and other transboundary rivers;
- Development by the countries in the region of a common position regarding construction of large hydraulic structures;
- Exploration of co-financing possibilities in water projects implemented by the parties, taking into account the interests of Uzbekistan and its regional partners;
- Establishment of the regular exchange of information and data on water use among the countries in the region;
- Development of joint Regional Water Management Plans and identification of common tasks for the future, including climate change adaptation actions at the regional level and exchange of experience on issues of shared interest.

5.2.5. Setting Water Allocation Priorities

While defining priorities among water sector participants (all sectors and the environment), decisions should be based on the main goal of the society - "ensuring the improved living standards through efficient use of the available natural resources". Based on this:

- Number one priority is to meet basic human needs and provide the essential public goods for people;
- Determine subsequent priorities among sectors that are leading and determine the economy of a particular region (irrigated agriculture, industry, energy generation, fishery, recreation, water transport etc.) and the environment (including leaching saline land and aquatic ecosystems) for each major river basin reflecting development priorities of that particular region and through a cross-sector consultative planning process with the key stakeholders.

5.2.6. Development of Flexible Water Allocation Mechanisms Between Economic Sectors and in Irrigated Agriculture

Criteria for allocation of water quotas and limits should consider the needs of people and economy of Uzbekistan, including irrigated agriculture, and taking into account the diversity of regional contexts and needs, in accordance with the procedure established by the law of Uzbekistan, priorities determined in Section 5.2.5, and international best practice.

Transparent regulatory principles of water planning and allocation will take into account trends in water availability and demand, economic, social and environmental priorities of the country.

The water allocation system^[5] should be based on transparent and implementable water entitlements in the form of long term water quotas and permits on special water use based on accurate water balances and hydrological boundaries. The entitlements will be informed through formal notifications to the water users. Water users should understand their rights and responsibilities in the process of water allocation.

Water allocation plans based on available water in storage (including snowpack) should be developed through a transparent, clear and equitable approach taking into account variability of the situation through years and seasons. They should be responsive to uncertainties in the mid and long-term related to climate variability, economic and social situations.

Any changes to entitlements, for example due to water shortage, should be applied in accordance with agreed and clearly articulated procedures and processes in order that water users including other sectors, private investors and farmers could assess their risks and take appropriate adaptation measures. Regional or basin level drought management plans will be developed as part of this process.

5.2.7. Formalizing a System for Exchanging Water Entitlements

To satisfy demands to further increase agricultural productivity through cost-efficient water use, a fair and transparent system for exchanging water entitlements or parts thereof is envisaged.

The first step for such a system development is the creation of formal mechanisms for transfer of any water entitlement or part thereof (limited by the established quotas) within a canal system taking into account a feasibility of such a transfer. The parties to the transfer of such entitlements do it directly or may involve a state water management organization as an intermediary. Mechanisms to determine the transfer price of water entitlements will be determined taking into account the promotion of efficient water consumption by including in the cost of water reallocation of full cost coverage of water delivery, including investment costs.

In the future and after successful local pilots, a resale of water entitlements on a wider scale may be considered according to broader market principles. A prerequisite for this will be a fully functioning information system about the water status and use and flexible water allocations system. A feasibility study with due consideration of all these factors and the transparent and effective rules of water allocation and selling water entitlements will be undertaken in the second half of the Concept period.

5.3. Infrastructure Modernization and Development of Service Delivery in Water Sector

The issue of inefficient water use stems from outdated and worn-out water infrastructure resulting from lack of capital resources. One of the main cost item in water sector is pumped irrigation, particularly due to high electricity costs for pumping representing a significant burden for the state budget. Accordingly, the sector needs modernization of the infrastructure and technology, improvement of services and asset management system. Reliable and detailed information on surface and groundwater and costs of water delivery is also important to support effective water management, build trust amongst water consumers, investors and the public.

At the same time, participation of water users and water consumers, as well as agricultural producers in the planning of construction and reconstruction of irrigation and drainage assets is important. In this regard, it is proposed to establish a system for review and approval of these plans by the district and regional Councils of Parliament Members in the process of drafting state programs for construction and reconstruction of irrigation and drainage assets.

5.3.1 Modernization, Automation of Water Assets and Assurance of their Safety

To improve the physical condition of water assets and hydraulic structures, reduce water losses during conveyance, and improve ability of the irrigation system to respond to changing crop water demand, as well as to improve quality of irrigation services, the following measures are planned:

- Reconstruction, repair and rehabilitation of main, interregional, inter-farm and on-farm canals, including concrete lining and waterproofing works with the phased transition towards closed water conveyance and distribution systems using pipelines and other modern methods suited to demand water management;
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- Reconstruction and repair of headworks and hydraulic structures, replacement and rehabilitation of hydromechanical and electrical parts, provision of automated control and water metering systems on large canals and headworks;
- Rehabilitation of flume networks to be manufactured of composite and polymer materials meeting local climatic conditions of Uzbekistan;

To ensure safe and reliable operation of the existing water reservoirs and mudflow reservoirs (debris basins), it is envisaged to:

- Replace and rehabilitate hydromechanical and electrical parts, along with instrumentation and control system of reservoirs, their automation using modern ICT;
- Provide water reservoirs and mudflow reservoirs with automatic control and safety systems, along with emergency warning systems;
- Strengthen security and safety measures of the reservoirs.

In view of changing and variable river hydrology and more frequent mudflows and floods, there is a need to construct new water storages and mudflow reservoirs to increase efficiency of water resources management and mitigate risks of emergencies due to flooding.

5.3.2. Modernization and Reconstruction of Pumping Stations

In order to increase energy efficiency at the pumping stations managed by MoWR, reduce operational costs and increase performance factors of the pumps, the following measures are envisaged:

- Stage-wise upgrade and replacement of obsolete inefficient pumps and power equipment of pumping stations with modern energy-saving pumps and electric motors with high energy efficiency, including rehabilitation, overhaul and replacements of pressurized pipelines;
- Stage-wise replacement and upgrade of the existing transformers, control cabinets, cables and other power equipment of the old models with modern energy-saving equipment;
- Addressing the identified problems of energy efficiency and energy saving at pumping stations by conducting energy audits;
- Stage-wise equipping pumping stations with capacitors compensating reactive power, and modern frequency converters;
- Development of an automated monitoring and control system of electricity consumption at pumping stations in real time;
- Development of alternative energy sources, including solar panels at pumping stations;
- Implementation of efficient monitor control methods for operation of pumping stations.

5.3.3. Water Metering and Improvement of Water Accounting System

A single information system for water resources will be developed using modern accounting methods for water allocation and consumption, collecting and analysing information on water volumes and reserves of water, collecting data on water resources, demand and supply.

The following measures are envisaged to improve water accounting and the collection and processing of relevant information:

- Approval of data standards for all water resources;
- Development of measurement accuracy standards for accurate water measurement in rivers and canals, as well as at water consumer level;
- Development and improvement of information systems designed to collect and process information regarding water resources of rivers and mountain streams, lakes, reservoirs, canals and drains, pumping stations and other important water bodies based on modern technologies;
- Stage-wise implementation of automated systems to allow online monitoring of water flow and volume, water quality and other indicators of water bodies;
- Improvement of maintaining the state water cadastre through its automation, creation of a single information system on the national water resources, including surface, groundwater and return flow;
- Improvement of water metering system through equipping all water distribution stations with water management and water metering devices, including their improved operation and maintenance, and development of hydrometry;
- Establishment of local manufacture of modern measuring devices designed to measure flow rate, water volume and other indicators.

5.3.4. Improvement of Land Reclamation Status

The following measures are planned to increase irrigated land productivity, improve land reclamation status and drainage system:

- Improving the physical condition of collector-drainage networks and other land reclamation facilities, their modernization, consistent implementation of large-scale land reclamation measures within the framework of state programs;
- Assessment of the irrigated land conditions, monitoring of groundwater levels, keeping records of collector-drainage water, as well as improving the system of managing water-salt balance with broad use of information and communication technologies;
- Strengthening the strengthening financial sustainability and technical capacity of Hydromeliorative Expeditions providing them with modern equipment and mobile laboratories to perform rapid tests;
- Effective management of activities aimed at reducing salinity and leaching irrigated lands, research activities aimed at maintaining optimal groundwater levels and their salinity, studying advanced international technologies in this field and their implementation.

5.3.5. Capacity Building of Design Institutes and Improvement of Design Quality

In order to upgrade capacity of design institutions and skills base for engineering and implementation of modern irrigation systems, development of detailed design and procurement documentation, the following is envisaged:

- During sector-wise design reviews, pay special attention to engineering surveys in line with urban planning regulations and norms (ShNK), environmental impact and mitigation requirements according to the relevant construction regulations and norms (SNiP);
- Update and fundamentally revise the current regulatory and methodological documentation (SNiPs, rules, guidelines, etc.), taking into account the modern engineering science and practice;
- Further expand using of modern construction materials in hydraulic construction, conduct research and apply their results for drafting department-specific regulatory documents to regulate innovative structures and materials;
- Improve the regulatory and legal framework and regulatory and engineering framework for modern irrigation systems, in accordance with international and technical standards;
- Develop advanced training system for lead engineers, with involvement of international experts and research staff from research and educational establishments of the sector, using easily accessible online courses, trainings and seminars, including in foreign languages.
- Establish a system for learning advanced international experience both by individual experts and design institutes, through participation in design & engineering tenders, training programs, advanced training courses, and internships at the leading foreign universities and companies of the countries with developed water management system.
- Establish and create conditions for active functioning of engineering units and design supervision teams to support project engineering surveys and contact works on construction and reconstruction of water facilities at the TIAME, with participation of the leading experts and scientists of the Research Institute of Water Problems and Irrigation, SIC ICWC, and other relevant institutions;
- Organize professional capacity development of design institutions at the leading manufacturing and educational institutions of foreign countries with the aim of mastering international standards and modern engineering practices.

5.4. Strengthened Professional, Research and Innovative Capacity in Water Sector

There is a significant demand for highly qualified and experienced personnel in water management organizations possessing modern knowledge, skills and professional qualifications. Along with systematic training, vocational and advanced training on and off the job, it is important that they had the opportunity to work in favourable working conditions, strengthen their sector knowledge and skills, and finally had career development opportunities.

5.1. Capacity Development for Staff in Water Management

Skills development and training of engineering and technical staff in water management should be aimed at developing professionals capable to effectively address tasks of sustainable water management and efficient water use in all spheres of water management sector, reclamation of irrigated lands, as well as implementation and wide use of modern water-saving technologies. To achieve that the following is envisaged:

- Improve training efficiency at higher and vocational specialized educational institutions by introducing modern teaching & learning methods along with the maximum approximation of the training process to production realities and need for a greater focus on management and delivery of quality services;
- Develop special short-, mid-, and long-term training modules in various water management subjects for new and existing staff;
- Sequentially open regional specialized higher education institutions in the form of TIAME branches - first in the Ferghana Valley, and later in Khorezm-Karakalpakstan region;
- Create the sustainable advanced training system for lead water experts and top managers with involvement of recognized national and international scientists and specialists and develop modern teaching technologies and distance learning;
- Raise awareness and build capacity for incorporating climate change mitigation and adaptation into water resource planning and management and development of early warning systems.

5.4.2. Strengthening Water Sector Research Activity and Broader Extension of Research Results

To ensure high performance and extension of research activity, the following is envisaged:

- Strengthen financial sustainability and technical capacity and capacity building of research and educational institutions in the water management system, including TIAME, Research Institute of Water Problems and Irrigation, and other relevant institutions;
- Increase financing of research and development activity on relevant issues of water sector;
- Implement a practice of securing additional funds for design and engineering in the amount of 10% of the total design and engineering budget in order to support research and engineering activity;
- Create favourable conditions for research teams to conduct applied research of water-saving technologies at trial and demonstration sites;
- Enhance research activity at research institutes, centres and stations, educational institutions with strengthened applied focus of the activities and their results;
- Encourage closer cooperation between international research institutes with national research institutes, including staff secondment to the international institutes;
- Establishment of research trial and demonstration plots for water and energy-saving technologies, as well as alternative energy sources;
- Secure incentive mechanisms and financial support from broader range of sources for research and consultancy activity focused on implementation of modern water-saving technologies.
- Conduct research involving inclusion of climate change modelling into the water planning process and applied research to support development of adaptation plans;
- Research and development activity to support development of efficient water data gathering and water accounting systems.

5.4.3. Widespread Use of Information and Communication Technologies (ICT) in Water Sector

To enhance implementation of information and communication technologies and innovations in water sector, the following measures are envisaged:

- Development and implementation of a single water management information system integrated with databases of ministries and departments, including the Single Portal of State Services and interdepartmental automated on-line information exchange system;
- Automation of control process at hydraulic structures, water monitoring and accounting, development of on-line information monitoring system on water flow rates and volumes at water facilities;
- Development of a cadastre management system for water assets using geographic information system;
- Wide application of unmanned aerial vehicle (UAV) technology in water sector, including for geoinformation support for MoWR;
- Broader use of ICT, GIS, remote sensing applications and UAV technology to assess and monitor the reclamation status of irrigated lands and avoiding soil salinity;
- Development of an information system on the reclamation status of irrigated lands, level and salinity of groundwater;
- Further extended application of remote sensing technology using satellite tools to assess water conveyance uniformity to the irrigated lands, crop pattern and desertification processes, and assess water productivity;
- Development of an effective hydrological modelling platform for supporting planning and integrated water resources management, and for assessment of human and environmental impacts;

- Optimization of water allocation and canal operation regimes, diversification of crop production during periods of low water availability, and through this widespread use of software designed for effective irrigation management.

5.4.4. Wider Application of Water-Saving Technologies and Increasing Water Use Efficiency

For further wide application of water-saving technologies and increased water productivity and water use efficiency in agriculture, the following measures are expected:

- Further development of state support system for agricultural producers, who apply water-saving methods and technologies;
- Widespread implementation of water-saving technologies with water delivery using pumping stations and pumping units, including in the cultivated areas irrigated with irrigation wells and vertical drainage wells;
- Improvement of incentive mechanisms for research and development on using water-saving methods and technologies, taking into account soil, climatic and other regional characteristics of the country and incorporating lessons from previous pilots, including developing highly efficient systems that require lower maintenance costs;
- Improvement of the mutual cooperation between industrial sectors in manufacture of components and spare parts for water-saving irrigation systems, including drip and sprinkler irrigation technologies;
- Awareness raising of water saving technologies including highly efficient surface irrigation methods;
- Development of guidelines for the design, implementation and application of water-saving technologies, as well as criteria for evaluating their performance based on specifics of irrigated areas, crops and varieties;
- Organization of training, retraining and advanced training of experts on implementation and use of water-saving irrigation practices and technologies;
- Expanding the technology for crop pattern development using automated laser planners, as well as an underground closed irrigation system using modern flexible pipes;
- Development and implementation of evidence-based water rotation standards in industry and municipal services;
- Use of remote sensing systems for monitoring and targeted water productivity improvement;
- Implementation of water rotation and other arrangements, as well as technologies to control field level water losses and non-revenue water.

CHAPTER 6. EXPECTED RESULTS OF CONCEPT IMPLEMENTATION

As a result of the Concept implementation, achievement of following targets is envisaged until 2030:

1. Adoption of the law of Uzbekistan "On Water and Water Use" in its revised version by the end of 2020 and the "Water Code of Uzbekistan" by the end of 2023.
2. Achievement of water related Sustainable Development Goals of Uzbekistan by 2030.
3. Conducting the functional analysis of the water sector management system in accordance with international standards and practices, development and implementation of a new management system based on the following principles:
 - clear definition of the tasks, roles and authority of each state body;
 - clear delineation of roles related to (i) development and implementation of water policy, (ii) regulation of water allocation and use in different sectors of the economy, (iii) operation of water infrastructure and provision of water services; (iv) compliance monitoring over water limit, procedures and rules for water use and water consumption.
 - transition from the use of mainly administrative state regulation towards market economy methods and mechanisms;
 - integrated water resources management covering the overall use and consumption of water resources of Uzbekistan and their allocation between sectors and the environment.
4. Establishment of a comprehensive national system for water accounting, planning and management linked to the national cadastre database ensuring greater transparency and data availability.
5. Implementation of a new water quota allocation system in the irrigation sector meeting demand of agriculture and principles of productive and efficient water use in irrigation.
6. Increasing the performance factor of irrigation systems from 0.63 to 0.73 and increasing water productivity by reducing the specific volume of water use per hectare of irrigated area in agriculture by 20%.
7. Reduction in irrigated land area with low water availability from 560,000 ha to 190,000 through development and implementation of plans aimed at improving water supply of the irrigated land.
8. Bringing the share of modernized and concrete main and inter-farm canals from the current 34% to 66%.
9. Replacement of 1,750 pumping units and 2,100 electric motors with modern energy-saving ones.
10. Reduction in the annual volume of power consumption at pumping stations managed by the Ministry of Water Resources to 7.0 billion kW/h by 2025, and to 6.0 billion kW/h by 2030.
11. Expansion in the total area covered by water-saving practices and technologies from 127,000 ha to 1.0 million ha by 2025 and up to 2.0 million ha by 2030, including drip irrigation technology - from 77,000 ha to 300,000 ha by 2025 and up to 500,000 ha by 2030.
12. Implementation of water-saving methods will allow for ensured water supply to population and various sectors in the future by means of water saving.
13. Reduction in the total area of saline irrigated lands from 1,935,000 ha to 1,722,000 ha, and that of medium- and highly saline lands from 607,000 to 430,000 ha.
14. Reduction in the area of irrigated lands with a critical groundwater level (0-2 m) from 1,051,000 ha to 773,000 ha.
15. By 2025, recommissioning of 298,500 ha of abandoned irrigated land into agricultural production.
16. Adoption of new methods and techniques, including ICT and other innovative technologies, for determining irrigation water demand, monitoring of water allocation and water productivity and feeding into management decisions, particularly in the periods of water shortage.

Increase in the number of water facilities equipped with an automated water accounting system - Smart Water - from the existing 61 units to 151 units in 2020, 560 units by 2025, and 1,000 units by 2030. Automation of the water management process at 100 large water facilities.

17. Equipping the reclamation observation well with automated monitoring system - 2,000 wells by 2020, 8,500 wells by 2025, and 27,279 wells 2030.
18. Installation of an on-line electricity consumption monitoring system at pumping stations managed by the Ministry of Water Resources - 100 units in 2020, 450 units by 2025 and 887 units by 2030.
19. Achieving water quality standards to the level specified in national legislation and according to the commitments taken by the country on environmental sustainability.
20. Implementation of public-private partnership projects in the water sector - 5 projects in 2020, 25 projects by 2025 and 50 projects by 2030.
21. Ensuring that water consumers cover part of the water delivery cost for irrigation, at least up to 15% by 2025 and up to 30% by 2030.
22. Following the administrative reform, the state water management organizations will have sufficient capacity to move towards more modern and sustainable water management system.
23. Training systems responsive to the challenges of modern water management will be implemented resulting in the share of water sector employees with higher education to achieve from the existing 42% to 50% by 2025 and to 65% by 2030; and a sustainable national system for advanced training of experts and management staff on water management subjects will be developed.
24. Salaries of employees of water management organizations will be made equivalent to the average monthly salary in the country.
25. Measures will be taken to conserve natural water sources and water ecosystems and their sustainable supply with water resources.
26. Through the conjunctive management of surface, groundwater and return flow, a system for conservation and sustainable use of strategic groundwater resources, primarily suitable for drinking, will be being created.

CHAPTER 7. CONCEPT

MONITORING

The activity on ensuring complete, timely and high-quality implementation of the Concept, constant compliance monitoring of the indicators and development of a program of required measures, addressing all challenges that impede sustainable and integrated development of the water sector in the country will be carried out by a special Commission created with participation of international experts under the Ministry of Water Resources of Uzbekistan.

At the same time, the measures will be developed and taken to implement the Water Resource Management and Irrigation Sector Development Strategy to implement reforms and priorities in the water sector as stipulated in the Concept.

[1]The water conveyance network in open water systems consists of the main canal, inter-farm, farm and on-farm distributing canals (distributors). The main canal conveys water from a river, reservoir, well, etc. to inter-farm distributors. The inter-farm canals convey water to individual farms or crop rotation fields. Farm canals convey water to every farm, and when a farm is large - to individual large irrigated sites. On-farm canals (distributors) convey water to crop rotation fields or irrigated sites.

[2]As of 2019, WCAs had UZS 67.1 billion of receivables and UZS 153.1 billion payables, of which UZS 20.99 billion for paying salaries.

[3]The average performance factor of all irrigation systems in the country is 0.63, including of inter-farm irrigation network - 0.83, farm and on-farm irrigation network - 0.79. Moreover, in some regions of the country, in particular, in the Republic of Karakalpakstan and Bukhara region, the performance of irrigation systems does not exceed of 0.53 and 0.55, respectively.

[4]According to the "Agriculture Development Strategy of Uzbekistan for 2020-2030", this indicator is planned to be brought up to 30% by 2030.

[5] The water allocation system comprises the following elements: water entitlement; seasonal allocation; water requests; control and regulation of water delivery; volumetric measurement of water delivery; enforcement of the plan and imposing fines for water misuse; accounting of actual water use per year as compared to allocation.

**Annex 1 to the Concept of Development of the Water Sector of
Republic of Uzbekistan for 2020-2030**

Key Targets and Indicators to be achieved as a Result of Implementation

Concept for Development of the Water Sector of the Republic of Uzbekistan for 2020-2030

№	Indicator	Unit of Measurement	As of today (2019)	Indicators to be achieved	
				2020	2021
I. Rational Use of Water Resources					
1.	Improving the efficiency rate of irrigation networks	%	0,63	0,64	0,65
1.	Reduced proportion of irrigated areas with limited water availability	Thousand hectares	560	526	492
		%	13	12	11
1.	Modernization of primary and inter-farm canals and increased share of canals with lining	km	9 675,7	9 960,3	10 52
		%	34	35	36
1.	Replacement of existing pumping station units with energy-saving pumping units	units	732	163	163
1.	Replacement of obsolete electric motors of pumping stations with new electric motors	units	1 627	214	219
1.	Energy savings at pumping stations	Billion kWh	8,0	7,6	7,3
II. Scaling up Utilization of Water-Efficient Technologies					
III. Scaling up the use of Water-Saving technologies					
1.	Implementation of water-saving irrigation technologies	Thousand hectares	127,5	250	350
		%	3	5	8
1.	Increased share of areas with drip irrigation technologies implemented	Thousand hectares	77,4	125	200
IV. Improvement of Meliorative Condition of Irrigated Lands					
1.	Reduced proportion of salinized irrigated areas	Thousand hectares	1 935	1 926	1 906
		%	45,7	45	44,6
1.	Reduced proportion of areas with critical level of groundwaters (0-2 m)	Thousand hectares	1 051,1	988,1	945,2
		%	24	23	22
1.	Reduced proportion of areas with strong and medium salinity in relation to total irrigated areas	Thousand hectares	607	581	559
		%	14	13,5	13
1.	Reclamation of land plots where cultivation was previously discontinued	Thousand hectares	48	58,2	41,5
V. Implementation of Modern Information and Communication Technologies in the Water Sector					
1.	Implementation of the Smart Water system for real-time monitoring and control of water accounting at water facilities	unit	61	151	251
1.	Automation of management processes at waterworkcilities	unit	-	10	20
		unit	66	2 000	4 022
1.	Upgrading groundwater measurement wells with automated monitoring system	%	0,25	7,3	30

№	Indicator	Unit of Measurement	As of today (2019)	Indicators to be achieved	
				2020	2021
1.	Implementation of online monitoring system of electricity use at pumping stations	unit	-	100	250
		%	-	6	20
VI. Improving Research Activities and Introducing Market Mechanisms in the Sector					
1.	Expanding the scope of research and development efforts in the water sector, developing scientific and innovative potential, introducing R&D products and know-how	unit	15	25	28
1.	Implementation of public-private partnerships projects in the water sector	project	-	5	15
1.	Reduced share of budget funds allocated for water management through introduction of market mechanisms in water management	%	-	-	3
VII. Provision of Human Resources in the Sector					
1.	Providing human resources with higher education to the sector	person	297	400	400
1.	Increasing availability of personnel with higher education in the sector	%	42	45	47
1.	Increasing the size of the monthly salaries of water sector workers up to the average monthly salaries in the country (in comparison with the average monthly salaries)	%	64	75	85

**Annex No. 2 to the Decree No.of the
President of the Republic of Uzbekistan
issued on 2020**

ROAD MAP

on the implementation of the Development Concept of Water Resources in 2020-2030

n/n	Activity	Mechanism of Implementation	Implementation Timeframe	Responsible Executive
I. Improving Legal and Regulatory Framework				
1.	Formulation of a draft law of the Republic of Uzbekistan "On changes and amendments to the Law on Water and Water Use of the Republic of Uzbekistan".	Law of Uzbekistan	July 2020	Ministry of Water Ministry of Agricu Ministry of Water State Committee
1.	Systematization and codification of legislative acts in the area of water and water use. At the same time, implementation of new effective mechanisms for managing water resources, water use and water consumption.	Water Code of Uzbekistan	January 2023	Ministry of Housir State Committee Ministry of Agricu
1.	Drafting of the Strategy for Development of the Water Management and Irrigation Sector, envisaging: Specifying the functions and tasks of the Ministry of Water Resources in the area of water resources management, including the use of surface, underground and return waters, as well as oversight of water facilities; development of mechanisms for monitoring of the compliance with the rules of water consumption and water use;	Decree of the President of Uzbekistan	September 2020	Ministry of Water Ministry of Agricu Ministry of Financ Environmental Pr Mineral Resource
	identification of new mechanisms for the operation of irrigation and land reclamation systems, their restoration and repair, water supply to sectors of the economy;			Ministry of Housir
	establishment of quotas for water, consistent with the new principles of efficient and rational use of water;			
	determination of the goals and objectives of the reform and development of the water sector in accordance with the principles of IWRM			
II. Integrated Water Resources Management, Improving the System of Water Accounting and Reporting, as well as the Establishment of Water Use Standards				
1.	Improving the mechanisms for obtaining information related to the water cadastre, data exchange between departments, including the integrated management of surface, ground and return waters.	Comprehensive measures	September 2022	Ministry of Water Ministry for Deve Communications, Ministry of Emerg State Committee Committee of Ecc Uzbekhydroenerg

п/н	Activity	Mechanism of Implementation	Implementation Timeframe	Responsible Executive
				Ministry of Water
				Ministry of Agricu
1.	Setting-up public advisory bodies (councils) on water management at the national, regional and basin levels with the participation of civil society representatives.	Organizational event	March 2021	State Committee
				State Committee
				Davyergeodezkac
				Ministry of Emerg
				Ministry of Water
1.	Creation of database at the Ministry of Water Resources for sectoral reporting and accounting of water resources.	Comprehensive measures	2021-2023	Ministry of Agricu
				State Committee
				State Committee
III.	Scaling-up Implementation of Water-efficient Irrigation Technologies			
	Across-the-board introduction of water-saving crop irrigation technologies.			Ministry of Water
	In particular, expansion of areas with the introduction of water-saving technologies up to 1.0 million hectares by 2025, and 2.0 million hectares by 2030;			Ministry of Agricu
1.	expansion of areas with the introduction of drip irrigation technologies by 2025 - up to 300,000 hectares, and up to 500 thousand hectares by 2030.	Comprehensive measures	2020-2030	Ministry of Financ
				Ministry of Econo
				Ministry of Water
1.	Development of criteria for determining the areas of priority implementation of water-saving technologies. At the same time, inclusion of factors such as the cost of water delivery, water availability, economic efficiency of the crop, etc.	Regulatory act	January 2021	Ministry of Agricu
				Council of Farmer of Household Plot
				Ministry of Water
				Ministry of Agricu
1.	Establishment of a system of mutual cooperation between industrial sectors in the production of components and spare parts for water-saving irrigation systems, including drip and sprinkler irrigation technologies.	Comprehensive measures	Recurrent	Ministry of Financ
				Ministry of Econo
				Chamber of Comi
				Ministry of Water
				Ministry of Agricu
1.	Formation of annual targeted programs for the introduction of water-saving technologies, including drip irrigation.	Comprehensive measures	Recurrent	Ministry of Financ
				Council of Farmer of Household Plot
				Ministry of Water
1.	Development of guidelines for the design, implementation and application of water-saving technologies	Comprehensive measures	2020-2022	Ministry of Agricu
				TIHIMSH and its r
IV.	Modernization of Water Facilities, Prevention of Water Losses in Canals and Introduction of Energy-efficient Technologies			
	Repair and modernization of primary, inter-farm canals and their hydraulic structures, concrete lining and other measures to prevent seepage.			Ministry of Water
1.	At the same time, the annual growth in the efficiency of irrigation networks by 1% and increasing it up to 0.73 by 2030	Comprehensive measures	Recurrent	Ministry of Financ
				Ministry of Investr
				Ministry of Agricu
				Ministry of Water
1.	Phased implementation of modern canal water management systems, including closed irrigation network systems.	Comprehensive measures	2023	Ministry of Financ
				Ministry of Investr
				Ministry of Agricu
				Ministry of Water
1.	Forming the list of promising projects aimed at managing water resources, enabling efficient use of water and improving the technical condition of hydraulic structures (waterworks) and their safety.	Targeted (Special) Programme	September 2022	Ministry of Investr
				Ministry of Financ
				Ministry of Water
1.	Rehabilitation and repair of waterworks, large hydraulic structures and their hydromechanical and electrical parts.	Comprehensive measures	Recurrent	Ministry of Financ
				Ministry of Energy

п/н	Activity	Mechanism of Implementation	Implementation Timeframe	Responsible Executive
1.	Phased modernization of pumping stations, including the replacement of obsolete pumps and electric motors with modern energy-saving pumps and electric motors with high energy efficiency.	Comprehensive measures	Recurrent	Ministry of Water Ministry of Finance Ministry of Investment Ministry of Energy Ministry of Water Ministry of Finance Ministry of Energy
1.	Replacement of transformers, control stands, cables and other power equipment of obsolete models and low energy efficiency at pumping stations.	Comprehensive measures	Recurrent	Ministry of Finance Ministry of Energy
V. Improvement of Ameliorative Condition of Irrigated Lands				
1.	In order to improve the reclamation state of irrigated lands and their sustainable conservation, construction and rehabilitation of reclamation facilities, as well as the implementation of repair and restoration works	Comprehensive measures	Recurrent	Ministry of Water Ministry of Agriculture Ministry of Finance Ministry of Investment Ministry of Water Ministry of Agriculture Ministry of Finance Ministry of Investment
1.	Stage-by-stage procurement of portable mobile measuring devices for monitoring the reclamation state of irrigated lands.	Comprehensive measures	2021-2025	Ministry of Finance Ministry of Investment
1.	Reclaiming 298,500 hectares of agricultural land where farming was previously discontinued	Comprehensive measures	2021-2025	Ministry of Agriculture Ministry of Water Ministry of Finance
VI. Development of Interstate Relations in the Use of Transboundary Water Resources				
1.	Development of mutually acceptable mechanisms for joint management of transboundary water resources of the region between Central Asian states.	Organizational event	October 2022	Ministry of Water Ministry of Foreign Affairs Uzbekhydroenergy Ministry of Agriculture Ministry of Energy Ministry of Water Ministry of Foreign Affairs Uzbekhydroenergy Ministry of Agriculture Ministry of Energy Ministry of Water Ministry of Foreign Affairs Uzbekhydroenergy Ministry of Agriculture Ministry of Energy Ministry of Water
1.	Development of activities aimed at promoting the norms and principles of UN conventions on the use of transboundary waters.	Comprehensive measures	November 2022	Ministry of Foreign Affairs Uzbekhydroenergy Ministry of Agriculture Ministry of Energy Ministry of Water Ministry of Foreign Affairs Uzbekhydroenergy Ministry of Agriculture Ministry of Energy Ministry of Water
1.	Establishment of a joint monitoring and open data exchange mechanism for the implementation of a program to improve flow measurement on the scale of the Syrdarya, Amudarya and other transboundary rivers	Comprehensive measures	December 2024	Ministry of Foreign Affairs Uzbekhydroenergy Ministry of Agriculture Ministry of Energy Ministry of Water
Introduction of Market Principles in Water Management, Raising Foreign Investments into the Sector, Introduction of Public-Private Partnership mechanisms in Water Management				
1.	Jointly with the World Bank and other international financial institutions, design of the State Investment Program aimed at raising investments for the top priority projects for modernization of water facilities.	Targeted (Special) Programme	July 2021	Ministry of Water Ministry of Agriculture Ministry of Foreign Affairs Ministry of Finance Ministry of Investment Ministry of Water Ministry of Agriculture Ministry of Foreign Affairs Ministry of Finance Ministry of Investment
1.	In order to widely raise private investments, including foreign investment, as well as grants and loans from international financial institutions and foreign countries, development of investment and grant projects.	Targeted (Special) Programme	Recurrent	Ministry of Agriculture Ministry of Foreign Affairs Ministry of Finance Ministry of Investment

п/н	Activity	Mechanism of Implementation	Implementation Timeframe	Responsible Executive
				Ministry of Water
				Ministry of Agriculture
				State Committee
1.	Development of mechanisms for transferring part of the management functions of water resources to water users (farmers, clusters and others) based on specific criteria.	Comprehensive measures	Май 2022	State Committee Housing and Utilities
				Ministry of Finance
				Ministry of Water
1.	Development of proposals for implementation of outsourcing services in the use of water facilities, their operation and water delivery.	Organizational event	December 2021	Ministry of Finance Center for Rental
				Ministry of Water
				Ministry of Agriculture
1.	Development of a methodology for determining the level of water pollution and calculating water tax rates and fines for water users, taking into account their industry-specific and technological features and the degree of quality of return water, including mineralization and other pollutants.	Regulatory act	December 2021	State Committee Committee on Geology
				Ministry of Housing
				Ministry of Finance
				Ministry of Water
				Ministry of Finance
1.	Development of mechanisms of economic incentives for raising non-government financial resources into rational use and management of water resources, as well as for introducing innovative ideas into the sector.	Comprehensive measures	December 2022	Ministry of Agriculture State Committee Committee on Geology
				Ministry of Housing
VIII. Introduction of Modern Information and Communication Technologies in the Water Sector				
				Ministry of Water
1.	Creation of a database of ministries and departments, including single portal of public services, as well as a single information center for water resources management, integrated with interdepartmental automated system for rapid exchange of information	Organizational event	November 2022	Ministry for Development Communications, National Agency for
				Ministry of Water
1.	Automation of the processes of management, control and calculation of water at water facilities, including upgrade of 100 hydropower plants to an automated control system by 2030.	Organizational event	Recurrent	Ministry for Development Communications, Ministry of Agriculture
				Ministry of Finance
				Ministry of Water
1.	Implementation of the Smart Water system for real-time control and monitoring of water at water facilities, including growth in the number of facilities with the installation of Smart Water devices up to 1000 units by 2030.	Comprehensive measures	Recurrent	Ministry for Development Communications, Ministry of Innovation
				Ministry of Water
1.	Creation of an information system on the reclamation status of irrigated lands, as well as on the level of groundwater and their salinity.	Organizational event	2021-2030	Ministry for Development Communications, Ministry of Finance
				Ministry of Finance
				Ministry of Economy
				Ministry of Investment
				Ministry of Water
1.	Creation of a hydrological modeling platform with integrated management of water use and planning.	Organizational event	2021-2025	Ministry for Development Communications, Ministry of Innovation
				Ministry of Water
				Ministry of Energy
1.	Upgrading pumping stations to integrated automated system for monitoring and accounting of electricity and pumped water	Comprehensive measures	2020-2030	Ministry for Development Communications, Ministry of Innovation
IX. Further Strengthening of Research Activities, Staff Development, Promoting R&D and Innovative Potential and Building-up the Capacity of Design Orga				

п/н	Activity	Mechanism of Implementation	Implementation Timeframe	Responsible Executive
1.	и исследовательскими центрами зарубежных стран, а также международных организаций по вопросам of Water Resources. Facilitating cooperation between the Information, Analytical and Resource Center and the Scientific Research Institute of Irrigation and Water Problems with the information and analytical and research centers of foreign countries, as well as international organizations on issues of Water Resources.	Organizational event	July 2020	Ministry of Water Ministry of Foreign
1.	Improving the infrastructure and facilities of the Research Institute of Irrigation and Water Problems, equipping with modern laboratory equipment.	Organizational event	December 2021	Ministry of Water Ministry of Finance Ministry of Water
1.	Development of mechanisms of incentives and better funding for research and consulting efforts focused on the introduction of modern water-saving technologies.	Regulatory act	December 2022	Tashkent Institute of Agriculture, Ministry of Higher Ministry of Finance Ministry of Water
1.	Conducting research, including modeling of climate change trends in the process of water resources planning, as well as conducting practical research on the development of adaptation plans for climate change.	Comprehensive measures	2020-2025	Tashkent Institute of Agriculture, Ministry of Higher Ministry of Innovation
1.	Setting-up regional specialized higher education institutions in the form of campuses of TIEIA in the Ferghana Valley, the Khorezm oasis and Karakalpakstan.	Resolution of the President of Uzbekistan	July 2021	Tashkent Institute of Agriculture, Ministry of Water Ministry of Construction
1.	Updating and radical revision of existing regulatory and methodological documents (SNiP (building codes), regulations, guidelines and others) taking into account the current stage of development.	Regulatory act	October 2021	Uzstandard Agency Ministry of Water Ministry of Agriculture

Annex No. 3
to the Decree of the President of the
Republic of Uzbekistan
No. UP -... dated ... April 2020

MEMBERSHIP OF THE COORDINATION COUNCIL
on the implementation of the Concept for Development of Water Sector
of the Republic of Uzbekistan for 2020-2030

1.	A. Aripov	–	Prime Minister of the Republic of Uzbekistan, Chairman of the Coordinating Council
2.	A. Vakhabov	–	Advisor to the Prime Minister of Uzbekistan on the Development of Agrarian and Food Sectors, <i>Deputy Chairman of the Coordination Council</i>
3.	S. Hamraev	–	Minister of Water Resources, <i>Deputy Chairman of the Coordination Council</i>
4.	J. Kuchkarov	–	Minister of Finance
5.	A. Sultanov	–	Minister of Energy
6.	B. Khojaev	–	Minister of Economics and Industry
7.	J. Khodjaev	–	Minister of Agriculture
8.	S. Umurzakov	–	Minister of Investments and Foreign Trade
9.	B. Kuchkarov	–	Chairman of the State Committee for Ecology and Environmental Protection
10.	B. Islamov	–	Chairman of the State Committee for Geology and Mineral Resources
11.	B. Nishonov	–	First Deputy Director General of the Center for Hydrometeorological Service
12.	M. Saliev	–	Minister of Housing and Public Utilities
13.	A. Khayitov	–	Chairman of the Council of Farmers, Dekhkan (Smallholders) and Household Plot Owners
14.	Sh. Sadikov	–	Minister for the Development of Information Technologies and Communications

15. A. Sanginov – Chairman of the Board of Uzbekhydroenergo JSC
16. A. Shadmanov – Minister of Health
17. A. Abdullaev – Chairman of the State Committee for Land Resources, Geodesy, Cartography and the State Cadastre
18. M. Esanov – Head of the Inspectorate for Oversight of the Agro-Industrial Complex under the Cabinet of Ministers
Head of the Presidential Administration of the Republic of Uzbekistan
19. A. Kasimov –
20. A. Ravshanov – Head of the Secretariat of the Cabinet of Ministers, *Secretary of the Coordination Council*