



National Stakeholder Consultations on Water: Supporting the Post-2015 Development Agenda

Tajikistan
May 2013



**Global Water
Partnership**
Central Asia and Caucasus



The Post 2015 Water Thematic Consultation

THE REPUBLIC OF TAJIKISTAN

NATIONAL CONSULTATIONS ON WATER IN THE POST-2015 DEVELOPMENT AGENDA

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Chapter 1. Significance of Water for the National Development

Considerable reserves of water resources and hydropower potential are a key to the Tajikistan's sustainable development.

Tajikistan is a landlocked country located in the south-east of Central Asia, with a territory of 143,100 km². Tajikistan borders Afghanistan to the south (border length is 1,030 km), China to the east (430 km), Kyrgyzstan to the north (630 km), and Uzbekistan to the north and west (910 km).

Glaciers. There are 14,509 glaciers in Tajikistan, with a total glacier area equivalent to 11,146 km² accounting for about 8% of the country's territory and concentrating 845 km³ of water. Affected by global climate changes, the Tajikistan's glaciers decreased in their area by 30% and in ice volume by 20%. Precipitation is a primary source forming water resources. Annually, the Tajikistan's territory receives an average of approximately 98.8 billion m³ of precipitation.

Rivers. Water originates from the formation of small streams the junction of which generates 947 rivers and temporary water courses. The biggest rivers are the Panj, Vakhsh, Syr-Darya, Zeravshan, Kafirnigan, Kyzylsu, and Karatag Rivers. All the Tajikistan's rivers form an average of 64 km³ of water per year, accounting for 55.4% of the mean multi-annual runoff in the Aral Sea Basin.

The Syr-Darya River Basin. The river's major tributaries, such as the Naryn River and the Karadarya River, start on the Kazakhstan's territory. In Tajikistan, the Syr-Darya's small tributaries, such as the Khojabakirgan, Aksu and Isfara Rivers, form only about 1% of the Syr-Darya's runoff with a volume of 0.4 km³ per year. There are numerous small rivers and gullies the runoff of which is insignificant, and many of them dry up in summer. The total runoff formed on the Tajik part of the Syr-Darya River basin is insignificant and amounts to approximately 1.1 km³ per year, Picture 2.

The Amu-Darya River Basin. The Amu-Darya's major tributaries are the Panj, Vakhsh, Zerafshan, and Kafirnigan Rivers, with their share in the total volume of water resources of this basin accounting for 82.5%. The Zerafshan River in the north-west of Tajikistan runs from east to west, and its mean multi-annual runoff is 5.14 km³ per year. Tajikistan uses only 3% of this river's runoff, and the rest goes to the territory of Uzbekistan and is completely diverted for irrigation and other economic needs. For many decades so far, the Zerafshan River does not reach the Amu-Darya. The main Amu-Darya River and its tributaries' runoff (about 83%) is formed on the territory of Tajikistan.

Lakes. 1,300 Tajikistan's lakes concentrate over 46.3 km³ of water, of which 20 km³ is fresh. High altitude lakes have been studied insufficiently due to their inaccessibility. They are primarily fed by glaciers and snow. The biggest lakes are the Sarez, the Karokul, and the Zorkul. Lake Sarez appeared from the earthquake in 1911 and threatens the countries in the Amu-Darya River's basin with a potential outburst as a result of a potential major earthquake. Currently, the lakes' water resources are

not actively used in the economy as they are located in hard-to-reach mountain gorges with underdeveloped road infrastructure.

Underground Waters. Within Tajikistan, the explored and approved useful fresh underground water reserves amount to 8.24 million cubic meters per day, while the potential underground water reserves are estimated at 51 million cubic meters per day. Specific indices for useful fresh underground water reserves stand at 870 liters per capita per day, while those for potential reserves stand at 2,600 liters. This is one of the highest indices in the region.

Water Reservoirs. There are 10 water reservoirs in Tajikistan (the Kairakkum, Farhad, Kattasay, and Daganasay water reservoirs in the Syr-Darya River basin, and the Nurek, Baipazin, Sangtuda-1, Golovnoe, Muminibad, and Selbur water reservoirs in the Amu-Darya River basin) with a total volume of 15.35 km³. They regulate 23.9% of the runoff formed on its territory and 17.5% of the runoff if inflow from the neighboring countries is taken into account. Two of them are complex, for seasonal regulation, i.e. the Nurek (10.5 km³) and Kairakkum (4.1 km³) reservoirs which have regional importance for the Central Asian countries. However, all operation and maintenance costs are borne by Tajikistan. The volume of the water reservoirs in Tajikistan could be increased to 66.8 km³, which would account for 56.6% of the mean multi-annual runoff in the Aral Sea Basin. This is reasonable for protecting the Central Asian and adjoining states from droughts, low water, floods, adverse climate change impacts, and other unwanted water-related environmental and social effects. The existing water reservoirs are exposed to natural silting approximately by 1-2% of their total volume per year. The gradual silting of the water reservoirs will negatively affect the downstream countries which primarily rely on irrigation.

Recreation. The Tajikistan's nature has a huge recreational potential (over 5% of the territory), of which 2,567 km² (about 2%) is water-related. There were identified 162 landscape and natural monuments, 200 sources of natural mineral water, 18 mud and saline lakes in the country. The existing resources represent a potential for the future development of the Tajikistan's recreational base.

Tajikistan's Water Consumption for the near 10-15 years and a longer perspective will depend on the achievement of sustainable economic development, demographic situation, formation and implementation of living standards and consistent improvement of the population's livelihoods, and the development of all economic sectors.

The actual water intake in Tajikistan is about 15% of the volume forming in the country and 12% of the mean multi-annual runoff in the Aral Sea Basin. In Tajikistan, key water consumers are agriculture accounting for 84 to 94% of the entire volume of the waters used, utility and drinking water supply accounting for up to 8.5%, industry accounting for up to 4.5%, and fishery accounting for up to 3%. Water supply is a priority type of water use, and using water for hydropower engineering needs has a high social and economic importance.

Chapter 2. Key National Priorities in the Area of Sustainable Water Resources Development

Key WRM Priorities

Water use and protection governance is based on the combination of the basin and administrative-territorial management principles and is carried out by the Government of the Republic of Tajikistan, local executive authorities (Khukumats) as well as specially authorized government authorities engaged in water use and protection regulation. Overall, Tajikistan has a complicated hierarchical structure with diverse functions in the field of water resources use and protection (regulation, forecasting, use and

protection, planning, analysis, policy, tactics, and strategy) as well as multidisciplinary nature of water use and diverse requirements to water resources in terms of quantity, quality, and regimen. It is therefore needed to soundly improve the water industry management system at the national level.

Hydropower Engineering. The hydropower accounts for 98% of the country's energy balance. Tajikistan has 4% of the global hydropower reserves which is equivalent to 527 billion kWh per year, thus three times exceeding the current electrical power needs of Central Asia which primarily uses thermal power plants with their carbon and other hazardous emissions. So far, only about 3.2% of this potential has been developed. Unfortunately, Tajikistan lacks electrical power in the amount of approximately 5 billion kWh per year and has to limit electricity consumption every year from October through April. Tajikistan entirely relies on the import of oil products and to a large extent on gas imports.

Caused by the insufficient cooperation in the water and energy sector, direct losses of the Central Asian states are estimated at US\$1.750 billion annually. The modern use of hydropower resources allows generating in Tajikistan over 15 billion kWh of clean electrical power per year. Technically potential and cost-effective hydropower resources of Tajikistan which are not used at this development stage are huge and amount to 340 billion kWh per year. The primary potential for creating water reservoirs lies in the Amu-Darya River basin, i.e. the Vakhsh, Panj, Zeravshan, and Kafirnigan Rivers. The Panj River solely has over 10 sections for establishing water reservoirs with HPPs, with a full volume of 36.1 km³. According to the Concept approved by the Government, Tajikistan can increase the total volume of water reservoirs to 67.0 km³, which will account for 58.0% of the mean multi-annual runoff in the Aral Sea Basin. This will enable reliable water management and provision the Central Asian and other regions with electrical power. The Government of Tajikistan is making efforts to develop hydropower engineering and adopted Decree of the Government of the Republic of Tajikistan No.73 dated February 2, 2009, "On Long-Term Small Power Plant Construction Programme for 2009-2020". This Programme envisages the construction of 189 small HPPs with a total capacity of 26,801 kW.

The primary objective of water reservoir construction is to ensure integrated use of water resources for the benefit of hydropower engineering, irrigation, floods protection, fishery, recreation, technical and domestic water supply, with account taken for national and regional interests on a mutually beneficial basis.

Key constraints facing the intention to construct water reservoirs which need to be overcome:

- problems with exploring funds;
- a need to consider environmental, social, and transboundary consequences;
- forming an adequate public opinion at the national and regional levels;

Irrigated Agriculture. In Tajikistan, potentially irrigable lands constitute 1,573 thsd ha, of which 746 thsd ha are currently reclaimed and irrigated, with over 40% of the area supplied with water by pumps and accommodating over 2 million people. To prevent the transformation of this population into environmental refugees, the Government of Tajikistan, while introducing market mechanisms of water use, provides state support to the pump irrigation zones through providing donations from the budget and regulating tariffs for electrical power, irrigation water and land tax since the resolution of the environmental refugees' problem is considerably more expensive. One should also take into account that to compare with the Central Asian nations, Tajikistan has the lowest per-capita availability of irrigated lands. In 2011, it was 0.097 ha, which is 2-3 times less than that in the other neighboring countries which do not have sufficient own water resources. As the population grows, this index tends to decline. The irrigation systems' efficiency factor is 55.2%; and huge water losses on fields, poor efficiency and reliability of regional water recording, inefficient water management system at different

levels, and lack of economic mechanisms of management in the context of deficient water resources aggravate the water problem year by year. The efficiency of water resources use in irrigated agriculture is indicated by the income received per 1 cubic meter of water taken for irrigating agricultural crops or the amount of water used to receive one ton of yields. The productivity of water taken is very low, i.e. US\$0.2/m³. Such a decline in the water productivity is associated with the decline in crop yields caused by the reduced use of mineral fertilizers, wearing-out of the agricultural machinery stock and reduced coefficient of its use, poor technological discipline, and in compliance of the agricultural production organization with market conditions. In general, the Tajikistan's irrigation systems, as well as the pasture watering systems, are over 50% worn-out. The number of unused irrigated lands currently amounts to 15.3 thsd ha, although this figure reduced 13 times to compare to that in 2002. These systems must be completely rehabilitated, which requires about US\$746 million. There are relevant programmes supported by the republican and local budgets, economic entities and foreign investments; however, they are insufficient to ensure the basis for resolving the country's food security problem.

To prospectively reclaim all irrigable lands in amount of 880,000 ha, improve water availability for lands as well as prospectively develop other economic sectors, it is needed to increase the total volume of water reservoirs to 31.0 km³, i.e. the projected increase should be 15.7 km³.

The food problem becomes increasingly severe, and it would have to be addressed through increasing productivity of the existing lands, primarily irrigated ones, and reclaiming new irrigable areas to reach 1.6 million ha. The development of industry, particularly mining and processing industries, will also require additional volume of water. According to the Tajikistan's economic sectors development programmes, the projected water consumption should be at least 19-22 km³.

At the same time, all this is indicative of the huge existing potential for development. An alternative can be only the introduction of new irrigation technologies, integrated water resources management at the national and regional levels, water reservoirs construction, increasing of water conveyance systems' efficiency factor and joint maintenance of regionally important hydro-technical facilities by interested states.

Tajikistan needs substantial strengthening of the economic security which to a large extent determines national security and true sovereignty of the country. The total population will reach 10 million by 2020, i.e. the population growth rate will be 38.6%. The number of labor resources will increase by 40.9% by the end of 2015 and will amount to 4.5 million people, or 51.8% of the total population.

Water Supply and Sanitation belong to key life and economy sustaining systems, and these problems were defined as a priority state policy. The overall capacity of drinking water supply objects is currently 1,834.59 thsd m³ per day, and they are over 70% worn-out. Because of the electrical power deficit and other reasons, water is supplied to the population against the schedule, primarily in the evening and in the morning. Currently, in Tajikistan 53% of the population has access to drinking water, while only 44% of the urban population and 5% of the rural population have access to safe sanitation. About 30% of the republic's water distribution systems do not function for various reasons, with only 60% of the population using piped water and 40% of the population using water directly from rivers, channels, small irrigation network, other water sources which are unsafe in sanitary terms. The sewage treatment plants' performance does not exceed 40%. Water losses in the drinking water supply systems amount on average to 50-60%, i.e. over half of the water taken is lost. This is indicative of the poor water supply systems' performance.

The sanitation covers 23% of the population. It is required to rehabilitate and construct water supply and sanitation systems. The Law "On Drinking Water and Drinking Water Supply" adopted in 2010, the Poverty Reduction Strategy Paper, as well as the State Programme to Supply Tajikistan's

Population with Clean Drinking Water for 2008-2020, contribute to the achievement of Millennium Development Goals in this regard with a view to increase access to drinking water to 97% in cities and to 74% in rural areas and increase access to sanitation to 50% in cities and to 65% in rural areas.

To implement the drinking water supply programme, US\$966.53 million is required, of which 15% should be allocated by the republican budget, 10% by the local budgets, 5% from economic activities and 70% from the attracted investments. Over 2008-2011, only one third of the funds envisaged for that period could have been attracted.

Over the years of independence, **industry** has dilapidated and is recovering at a low pace. As of 1990, 607 million m³ of water was used for industrial needs. The total volume of water used in the industrial sector is currently insignificant, i.e. maximum 3% of the water used in the country, or about 240 million m³. A significant share of water for industrial needs is taken from the underground sources. The efficiency of using water resources in the industrial sector can be estimated on the basis of the output index in the industrial sector per one cubic meter of water per year. So, for instance, US\$50 of the industrial output per one cubic meter of water was received in 1990 (taking into account energy), while currently it amounts to US\$5-6/m³ of water.

In Tajikistan, **fishery** is a special water consumer. Here, aquaculture ponds are constructed in flood plains or very closely to the riverbed, thus, as opposed to the neighboring countries, allowing using water without substantial losses caused by irretrievable water use. Returned water is of quite good quality and is used to irrigate lands within the country and in the neighboring countries. Over 1995-2005, an average of 90 million m³ was taken annually, which is 4 times less to compare with water used in 1990. Over 2005-2011, the approximate amount of water used to fill aquaculture ponds has amounted to an average of 60 million m³ per year.

Ecology and Nature. Water resources play also a great role in the preservation of ecological systems, especially wetlands, protected areas, of which the most important are "Tigrovaya Balka" and the Tajik national park having biosphere significance.

In Tajikistan, floods and landslides occur up to 25 times per a decade. During floods, water velocity in mountain rivers may reach 60-80 km per hour. In particularly high-water years, damage caused by floods and landslides in Tajikistan reaches tens of millions of US Dollars. The potential outburst of Lake Sarez in the Pamirs with a volume of 17 km³ solely may cover 52,000 km² of the territory with the population of 6 million people in Tajikistan, Afghanistan, Uzbekistan, and Turkmenistan. So far, water-related natural disasters have caused a need to immediately resettle 700 families, and in next five years 10,037 families will have to be resettled as potential environmental migrants. To prevent this possible catastrophe and to rationally use waters of this lake for sustainable development, joint efforts of both the Central Asian countries and the global community are essential. Therefore, the Tajikistan's initiative to establish a relevant international consortium deserves utmost attention.

Chapter 3. Outlined Shortcomings, Plans and Proposals

The shortcomings noted during the national consultations are as follows:

Policies. Efficiency and effectiveness of water policies are not consistent with the Government's expectations (in political and economic terms). No adequate political and legislative framework for moving towards the IWRM principles was established.

Legislation. The water legislation has some out-of-date principles and preserves the outdated norms which are not compliant with new conditions and the IWRM principles. The water legislation does not have a direct effect; majority of the Water Code's Articles are applied after the issuance of relevant

Decrees of the Government of the Republic of Tajikistan; and no legal and regulatory acts are developed for many articles.

Water Sector Economy. The applied economic mechanisms for water use do not meet the IWRM principles. During the tariff identification, inclusion of the full cost of water supply services, as well as the infrastructure maintenance costs, is limited; artificially understated tariffs contribute to the wearing-out of water infrastructure elements; low salaries of water sector staff and brain drain of highly qualified professionals in the sector; lack of accurate water billing and control of electrical power consumed; poor economic education of water sector staff.

Governance Structure. Water resources are almost completely managed by public institutions; the basin management principle is not applied for irrigation and drainage; key managerial rights are concentrated at the central level; the principle of integrated management and collaborative participation of water users in the water resources management process is not applied. Weak vertical and horizontal coordination; sectoral and intersectoral problems are observed.

Water Infrastructure. The water infrastructure is worn-out, the equipment is technically and morally obsolete; the worn-out equipment consumes significantly more electrical power than envisaged by the norms; the water infrastructure continues deteriorating.

Ecology. The existing state system for controlling the use and protection of water bodies is unable to perform its functions fully due to technical, economic and staff constraints.

Plans and Proposals:

The dialogue's participants noted the priorities and made proposals as follows:

Regional level:

- Improve partnership relations, *inter alia*, between countries, donors, and civil society to implement the national vision of sustainable development;
- Jointly develop regional water, energy, food and environmental doctrines reflecting the behavior frames and intentions with regard to the rational use and protection of relevant resources;
- Launch the negotiations on establishing an international consortium to make Lake Sarez in the Pamirs safe for the benefit of the Central Asian states;
- In order to reduce greenhouse gas emissions in Central Asia and other countries, it is reasonable to make every possible effort to develop hydropower engineering with a view to increase its share to 45% of the region's total energy balance (recommendation of the SPECA Programme);
- Develop, and enter into, agreements "On Principles of Using and Protecting Water Resources of the Amu-Darya and Syr-Darya Rivers" between the Central Asian countries, including Afghanistan;
- Develop, and enter into, agreements "On Confidence Measures for Joint Management of Water Resources in Central Asia";
- Develop and adopt an agreed Interstate Water Apportioning Strategy and economic mechanism of water use in the Amu-Darya and Syr-Darya Rivers' basins;
- Accelerate the completion of the Rogun HPP construction to improve power supply and water availability for irrigation, compensate adverse climate change impact in the Amu-Darya downstream countries;
- Develop a regional Programme on introducing state-of-the-art water-saving technologies for irrigation of agricultural crops;
- Improve the economic mechanism of joint use of water and energy resources, hydro-technical facilities of interstate significance.

National level:

- Continue regional and international water policies based on the principles of fair, equitable and sound use of water resources with no substantial damage to the riparian countries;
- Strengthen the economic base and enhance the performance of water resources management institutions, upgrade staff skills;
- Rehabilitate and develop the water infrastructure, enhance the water use efficiency and productivity in various economic sectors;
- Improve the system of forming the public opinion in the country and in the region on transboundary hydropower projects being implemented or planned;
- Develop close cooperation with international governmental and non-governmental organizations, financial and political institutions in order to develop the national water sector and strengthen Tajikistan's regional and international position.

IWRM:

- Transition towards the hydrographic method of water resources management;
- Step-by-step implementation of the institutional reforms, integration of the strategy and water management;
- Public administration, introduction of democratic principles, economic mechanisms of water use and legislation meeting the IWRM principles;
- Introduce the principle of incentivizing water saving and increasing productivity of water and land use;
- Consider ecological and environmental requirements (sanitary and environmental releases, as well as water resources, for protecting the natural complex);
- Undertake a unified recording and planning of the use of surface, underground and returned waters;
- Build capacity via the educational process. Establish information systems, disseminate information...;
- Monitor and evaluate the IWRM implementation process;
- Carry out integrated scientific and research works on the implementation of the key IWRM principles.

Irrigation and drainage priorities:

- **Organizational and institutional priorities** (moving to IWRM; establishing WUAs; water saving and productivity enhancement programmes; improving the water records systems; enhancing specialists' skills, information base, etc.);
- **Rehabilitative/technical priorities** (enhancing water availability; repairing, rehabilitating, and upgrading the systems; reclaiming new lands; constructing water reservoirs...);
- **Economic priorities** (differentiated tariff system; investments, limitations, fines, incentives, taxes...);
- **Legal priorities** (improving the water legislation, normatives, by-laws...).

Water supply and sanitation:

- Construct, rehabilitate, reconstruct and widen the existing centralized water supply systems in cities, settlements and rural areas;
- Reform the water supply and water removal sector, implement effective tariff policies;

- Raise the population's awareness and its responsibility for water use and compliance with sanitary and hygiene requirements;
- Enhance the quality of drinking water disinfection in accordance with the requirements of state norms; provision and protection of sanitary zones of water sources and head water intake facilities used for water supply.

Also, the following was noted:

- Priorities on water-related disasters management;
- Priorities on improving the water resources protection system;
- Priorities on climate change and measures on water sector adaptation;
- Priorities on water tourism development.