

# **RISK (FLOOD AND DROUGHT) MANAGEMENT – CONSEQUENCES FOR THE DOWNSTREAM**

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Dear Ladies and Gentlemen!

Dear colleagues!

At present meeting dedicated to «Implementation of the integrate water resources management for common weal and future development in Central Asia» I would like to focus your attention both on current interstate relations in area of water use in the Syrdarya basin and on annual economic consequences for the downstream zone.

Currently one can literally say that water becomes a crucial tool in the international relations and one of the elements of national economic security. In this context, Kazakhstan is not the exception. National economic development per spatial-industrial system, province and city depends largely on water supply. This is particularly evident in the Syrdarya river basin, where Kyzylorda and Southern Kazakhstan provinces are located.

Many participants know well about the problems related to sharing of this river and the difficulties faced by Kazakhstan recently. First, these are excess releases of water along the channel in winter period and water shortage in the growing season.

Large-scale construction of irrigation and drainage systems in Central Asian republics and in the south of Kazakhstan was started in 1966 after the Plenum of C.P.S.U. Central Committee where a program of large-scale land reclamation in USSR was adopted. According to this program, development of new hundred thousand hectares of irrigated land and construction of hydraulic structures such as reservoirs, river regulating and intake structures, pumping stations, etc. were planned every five years. Necessary fund were allocated to republican and Union's budgets.

In eighties, water use increased in irrigated agriculture since expansion of irrigated areas was maintained at the same rates. As population growth in this region was the highest among other republics in the Soviet Union, new facilities were implemented in industry and other economic sectors and, as a

result, water consumption in non-irrigation sector increased as well. Thus, in the Syrdarya river basin, consumptive water use in non-irrigation sector rose from 2,25 m<sup>3</sup> in 1985 to 2,50 m<sup>3</sup> in 1990.

Under such conditions, a need for regional management of water resources in Amudarya river and Syrdarya river became apparent in the second half of eighties. A decision on adoption of a new management plan was made in 1986 in order to ensure water resources management and strict observance of inter-republican water allocation that are free of local interference. Thus, in 1987, Basin Water Organizations (BWO) were established for the Amudarya river and the Syrdarya river. They became responsible for management of all headworks at these rivers and their main tributaries, with discharge in the structures of more than 10 m<sup>3</sup>/s. BWOs controlled water resources according to rules and schedules agreed among the republics and approved by the Ministry of Water Resources of USSR. Hence, as early as in Soviet period, basic conditions were created for current mechanism of the interstate water management in the Aral Sea basin.

Water use in all economic sectors (especially for irrigation and power generation) was based on centralized control within the united country. Moreover, the former Government of USSR made compensations in form of fuel and electricity supplies to the Kyrgyz Republic.

The establishment of new independent states in Central Asia and the accompanied breach of former economic relations made mutual supplies of energy resources more problematic. Thus, national interests were added to already emerging regional problem, i.e. to the crisis of the Aral Sea and its coastal zone. Moreover, this was accompanied by breach of the coordinated operation of reservoirs in Naryn-Syrdarya cascade that was initially oriented to supply of irrigated lands.

Under such conditions Kyrgyzstan had to increase electric energy consumption due to lack of own fuel resources. Since major power generating facilities in Kyrgyzstan are based on hydropower of Naryn-Syrdarya basin, the country naturally started to use water accumulated in Toktogul reservoir. Thereby, operation of the reservoir shifted from irrigation to power generation mode. Now, power generation by Toktogul HEPS reaches maximum in winter when 6,0–8,5 km<sup>3</sup> of water are released from the reservoir, and to accumulate water releases are reduced to 4,5 – 6,5 km<sup>3</sup> during the growing season.

The specificity of the regional water sector is a multipurpose nature of water use. The main water consumer is irrigated agriculture, which uses more than 90% of the total usable amount. Along with irrigation, an equal component of water sector is hydropower; therefore, all major hydropower works in the Syrdarya basin are multipurpose. Hence, rational linkage of contradictory interests of irrigation and power generation related to different, in terms of

season, demands for river flow forms the basis of basin water management.

The widespread contradiction in the Syrdarya basin is that most regional water resources are formed in upstream, where hydropower interests of water users prevail, and water is mainly used in winter, whereas downstream users need water for irrigation in summer.

The complexity of water management in the Syrdarya river refers to its interstate nature, The river has flown within the boundaries of one country, that is first Russian empire and then the Soviet Union for about 125 years. Since 1991, with the occurrence of new independent states, the Syrdarya river has been flowing through 4 states. Water quantity and quality crisis has been aggravated due to abrupt changes in political and economic conditions in the region.

Since 1995, in order to resolve the contradictions, the Interstate Agreements on Water and Energy Use in the Syrdarya river basin have been signed between the Republic of Kazakhstan, the Kyrgyz Republic, and the Republic of Uzbekistan. Those agreements fixed amounts of water releases from Toktogul reservoir during the growing season for irrigation purposes and set compensation supplies of energy resources (natural gas, electricity, black oil, coal) from Uzbekistan and Kazakhstan to Kyrgyzstan in autumn and winter in exchange for supplied excess of energy generated by HEPS from additional releases in summer.

Despite the Inter-governmental Agreements on rational use of water and energy resources, partial change of operation mode does not solve the problem in general. Without comprehensive approach, seasonal distribution of hydro-resources for energy and irrigation needs steadily leads to reduction of water storage in Toktogul reservoir. So, in 1995 – 1997, by the beginning of growing season 1998, water storage in the reservoir dropped to 7,2 billion m<sup>3</sup> and to 8,6 billion m<sup>3</sup> in 2001 (dead storage is 5,5 billion m<sup>3</sup>). Only partial implementation of the agreements also contributed to the problem. In non-growing seasons 1999-2001, due to additional load on cascade's HEPS, amount of drawdown of Toktogul reservoir increased by 2,7 billion m<sup>3</sup> and caused additional releases from Shardara reservoir to Arnasay depression. These facts prove a need both for observance of annual inter-governmental obligations and for shift to long-term regulation of Toktogul reservoir.

Since 2001, water availability in the Syrdarya river basin has been higher than the average annual one, and the last two years were high-water years. In November 2004, due to high inflow to Shardara reservoir amounting to 1400 m<sup>3</sup>/s (similar to 2003), very tense situation occurred in river downstream related to water releases reaching 700 m<sup>3</sup>/s. According to average annual data, releases from Shardara reservoir to downstream zone did not exceed 380-400 m<sup>3</sup>/s during freeze-up. Numerous negotiations with the

Governments of Kyrgyz Republic, of Uzbekistan and Tajikistan regarding reduction of releases from the reservoirs of Naryn-Syrdarya cascade did not lead to desirable result. In order to prevent emergencies in downstream zones, the Government of Kazakhstan undertakes all possible measures and annually allocates funds for rehabilitation and repair of protection dams along the Syrdarya river in Kyzylorda province: 178 million tenghe in 2003; 200 million tenghe in 2004. Besides, in order to reduce flow, water has to be diverted by irrigation canals and old channels and exported to desert and non-populated areas. As a result, repair and rehabilitation was not undertaken for those canals. Moreover, excess winter flow caused water-logging of adjacent areas and, consequently, complicated timely fulfillment of spring-field works.

Despite a set of preventive measures for flood mitigation, the region has suffered huge damage. Settlements and irrigated land were water-logged, hydraulic structures and road sections were destructed, residents were evacuated from the waterlogged area, and so on. The total damage over two provinces cost about 2 billion tenghe.

In order to prevent such emergencies in the future and avoid forced evacuation of water into Arnasai, as well as to improve environmental conditions in Priaralie, activities under the Project "Syrdarya River Training and the Northern Aral Sea Preservation", First Phase are being finished. The Committee for Water Resources at the Ministry of Agriculture in Kazakhstan has approved investments for the second project phase, which includes: second stage construction of the dam in the Northern Aral Sea to raise water level in the Small Sea up to 46,0 m; construction of hydropower plant within Aklak waterworks to generate annually up to 23 MW; rehabilitation and construction of check dams, 500 km long in total; Syrdarya river-channel straightening; repair-and-renewal operations in headwork of Kyzylorda Left-bank main canal; rehabilitation of Aksai-Kuvandarya lake system; construction of Raim waterworks facility; construction of two bridges across the Syrdarya river instead of existing pontoon bridges. Besides, it is planned to study water balance and develop simulation model of the Syrdarya river.

Another quite contrary problem having the same causes as that of excess winter releases is shortage of water for irrigation during the growing season. The problem of water supply in downstream area is multiplied during the series of extremely dry years, when Toktogul reservoir, under reduced inflow in summer and forced drawdown in winter, loses its value as a long-term regulation reservoir. This case, its water storage is not enough to supply Syrdarya downstream zone with water.

The equally sensitive issue in the downstream zone and the delta system of the river could be construction of additional reservoirs by Uzbekistan to

accumulate 2 billion m<sup>3</sup> of water.

Artificial shortage during the growing season because of reservoir operation in power-generation mode causes big limitations for irrigated agriculture. This implies non-observance of irrigation regimes, leads to drying up and under-irrigation of crops and, finally, to low yields.

In this context, the very important issue for Kazakhstan is water use in the Syrdarya river basin and sharing water with riparian states according to international water law and based on mutual respect, trust and constructive cooperation. Thus, the interstate water use in Central Asia should be based, first, on common international conventions and framework agreements since those, as a rule, are comprehensive and fix general obligations for all state-participants and, at the same time, limit the parties by setting the prohibited actions. Such conventions as "Convention on Protection and Use of Transboundary Waterways and International Lakes of 1992", "Convention on Non-Navigation Use of International Waterways of 1997" should form the basis for regulation of the interstate relations in area of water sharing in the region. Those international law norms set general principles of state's conduct in joint use of transboundary waters and are important for ensuring legal rights of water-user states.

It is necessary to note that Kazakhstan is the only Central Asian country, which ratified the Convention on Protection and Use of Transboundary Waterways in 23.10.2000. Recognition of the Convention by other Central Asian states should be viewed as one of the important steps in the system of interstate relations regulating water sharing. Later on this will allow us to elaborate a common approach to subjects of international law or to parties of agreement in Central Asia. Unfortunately, this step has not been yet made in the regional cooperation. It would be legally justified to follow general norms of the international law in area of joint water use and protection.

Water conservation, water allocation and transboundary water management should get institutional, legal, and financial provision both at interstate level and at national policy level in order to lead to successful regional development. A number of projects are being supported by the Republic of Kazakhstan through the Committee for Water Resources so that to increase the Syrdarya river capacities and improve ecosystems and land reclamation systems.

At the interstate level, we consider as necessary to:

- raise status of ICWC and BVO "Syrdarya", internationalize BVO composition and introduce rotation of its management board in the future;
- revise water balance in the Syrdarya basin based on current conditions, i.e. when Toktogul and Kairakkum reservoirs are operated in power-generation mode for different years, in terms of water availability;

- develop a mechanism of water allocation where water consumption is reduced proportionally in dry years;
- redouble efforts in development and approval of the Agreement on Establishment of Water-Power Consortium, which, through market mechanisms, could resolve contradictions between the main actors of water sector in the Syrdarya basin;
- develop basin water cadastre, general database on all water users so that to ensure transparency and general access to information in the basin;
- implement automation in large intake structures throughout the Syrdarya basin;
- establish central server and connect national water-management organizations to the regional Hydrometcenter established under IFAS;
- develop an optimal legal framework that would ensure liabilities of all parties in the inter-governmental agreements for observance of agreement;
- severe discipline of execution and absolute fulfillment of all interstate agreements; maintain stability in interstate relations.