Adaptability of the Water Allocation System in the Amudarya River Basin to Changing Conditions

POLICY BRIEF

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The basin of Amudarya, one of the largest rivers in Central Asia, is a transboundary basin shared by Afghanistan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan (Figure 1). It is located in the arid zone and impacted by demographic growth, agricultural development, and climate change. The Amudarya River is the source of livelihoods for about 27 million people.

An increased frequency of extremes (droughts and floods) over the last fifteen years and the wider range of their peak values have been identified among the major effects of climate change in the Amudarya basin by SIC ICWC research in 2008.

In this context, it is crucial to adapt national and transboundary water management to operate efficiently under continuously changing conditions.

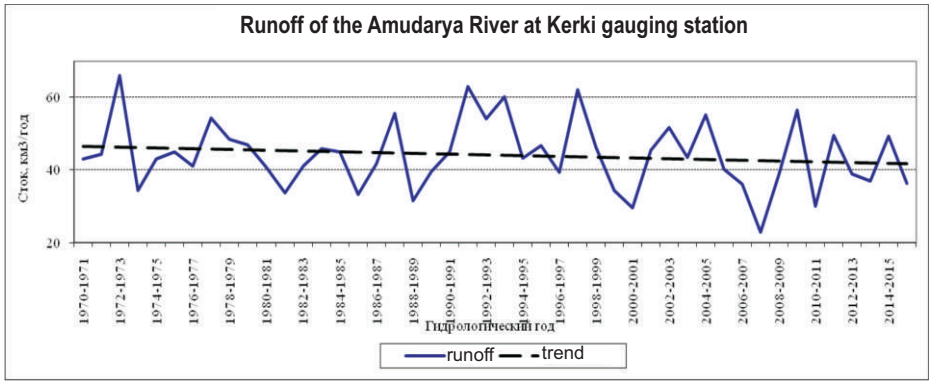
Adaptive management implies rules and procedures that are flexible enough to make decisions in unusual situations or under changing conditions but also clear and specific to ensure that those decisions are made in a timely and non-confrontational manner.

Adaptability comprises a number of engineering, managerial, social, legal, and economic measures but this policy brief will focus only on legal and institutional framework of water management in the Amudarya basin, with particular attention to water allocation aspects.

Source: Second Assessment of transboundary rivers, lakes and groundwaters UNECE, 2011

Fig. 1. Amudarya River basin

Box 1



Runoff of the Amudarya River over 1991- 2008 averaged 69.2 km^3 a year.
This is 1 km^3 lower than the average long-term glacial runoff over 1950-1990.

Project “Transboundary water management adaptation in the Amudarya basin to climate change uncertainties ”

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A degree of adaptability of the water allocation system in the basin to work under continuously changing conditions will be analyzed through key elements that include:

1) Availability of treaties and institutions mandated to deal with water allocation;
2) Flexibility of water allocation principles;
3) Availability of provisions and procedures providing for modifications and revisions of the water allocation system in operational management practices and in the long-term;
4) Emergency response.

The key findings of the analysis are summarized below.

The water allocation structure and principles are agreed upon in regional treaties

The fundamentals of the current water management in the Amudarya basin were laid by the Agreement on Cooperation in the Field of Joint Management of the Use and Conservation of Water Resources in Interstate Sources (Almaty, 1992). By this Agreement the Central Asian countries have agreed to be guided by "existing regulatory documents on allocation of water resources in interstate sources" (Preamble). Also the countries "are committed to ensure strict observance of the agreed procedure and established rules for water use and conservation" (Article 2). In 1995, the above provisions were again confirmed by the Heads of State in the Nukus Declaration: "The Central Asian states recognize the earlier signed agreements, treaties and other legal instruments in force that regulate relations between the states in the area of water in the Aral Sea basin and cause them to be executed."

Thus, the current structure and principles of allocation of water resources in the Amudarya are enshrined in Protocol 566 of the meeting of the Scientific-Technological Council at the USSR Ministry of Land Reclamation and Water Resources (Minvodkhoz) of September 10, 1987, which was approved on December 3, 1987 by the Minister Mr. N.F.Vasiliev.

Regional institutions mandated to deal with water allocation in the basin are established and operate

Establishment of joint institutions promotes higher stability and flexibility of the water management system. Such institutions were created in the Amudarya basin as well. For efficient inter-republican distribution and use of water resources in the Amudarya basin, the Minvodkhoz established an Amudarya Basin authority for inter-republican allocation of water and operation of water intakes and hydroschemes (named Uprvodkhoz "Amudarya" and later as Basin Water Organization or BWO Amudarya) in September 1987.

In 1992, the Interstate Commission for Water Coordination (ICWC) to deal with the issues related to regulation, rational use and protection of water resources in interstate sources (Almaty Agreement, Article 7) was established, and BWO Amudarya became an executive and interdepartmental control body of ICWC (Article 9).

ICWC is comprised of the heads of Central Asian country water agencies that must meet quarterly.

One of main objectives of ICWC is elaborating and approving annually water use limits for each republic and the region as a whole, schedules for reservoir operation regimes, correcting the former according to updated forecasts, depending on actual water availability and current water-related conditions (Article 8).

BWO Amudarya is responsible for routine management and regulation of water resources among the riparian states, timely and reliable allocation of water, according to the agreed limits, to users, and provision of sanitary and environmental flow for the Prearalie (former Aral Sea coastal zone) and the Aral Sea (Article 10). BWO Amudarya - based in Urgench, Uzbekistan - has four territorial divisions in Tajikistan (Kurgan-Tyube), Turkmenistan (Turkmenabad) and Uzbekistan (Urgench, Takhiatash). These territorial divisions have communication with provincial and basin organizations in the three riparian countries (Fig.2).

The water allocation principles are relatively flexible

The current distribution of the runoff of the Amudarya among the riparian countries is set on the basis of their historical and present water use, irrigated land in use, and estimated unit water use against the level of full water exhaustion. In addition, Protocol 566 particularly notes that "Further development of irrigation is admitted only within the established limits at the expense of the reduction of unit water use, which can be achieved by improving the water use practices, i.e. modernizing irrigation systems, reconstructing drainage, re-using return water in irrigation schemes, and improving irrigation technique and technology" (para.8).

Since 1992, ICWC has been approving the water withdrawal limits with account of nature demand in the Amudarya lower reaches, sanitary flow, and water to be discharged into the Aral Sea, while BWO has been ensuring supply of these limits. This established practice sets relatively flexible system for approval of the water withdrawal limits and the water releases for the delta and the Aral Sea in a hydrological year, separately for growing and non-growing seasons. This process is based on the forecasts made by hydrometeorological services depending on expected flow probability for given period of time and the current water-related conditions (including water storage).

Since the runoff of the Amudarya is shared by the riparian countries on a percentage basis, with possibility to reduce it proportionally depending on flow probability, the allocation of water is flexible (percentage shares) and, at the same time, specific (actual water availability). Basically, such allocation provides certain guarantees of water supply for each country and accounts changes in hydrological conditions.

Management response to changes deals only with operational matters of water allocation adjustment

The following mechanisms for rapid response to occurring changes serve as examples of flexibility embedded into the water allocation system in the basin:

- Mandating BWO to make on-the-spot adjustment if the water-related conditions or actual water availability in the basin change: at its 16th meeting on 22 April 1997 ICWC authorized BWO to adjust the water withdrawal limits and operation regimes of reservoir cascades provided that the above changes are within 10% of the total available water resources; however, if such changes are more than 10%, BWO must immediately submit proposals on adjustment of the limits to ICWC for consideration at its extraordinary meeting;
- Increase of water withdrawals to pass water through canals in case of catastrophically excessive flow, which, e.g. took place in 1998 (ICWC Meeting Minutes 21 of 23-24 October 1998), as emergency-environmental releases of water;
- Additional agreement signed between the Heads of national water authorities of Turkmenistan and Uzbekistan (May 2007) "On joint use of water between Turkmenistan and Uzbekistan in the Amudarya lower reaches". Based on this Agreement, it was decided to hold, every 15 days, a technical meeting of the representatives of the two countries

together with BWO to consider the matters of river water distribution, which was to be approved within twenty-four hours by relevant ministries of the both countries.

Provisions of Article 4, Agreement 1992 on "setting the limits of sanitary flow for every given year, bearing in mind water content in interstate sources" are very important for understanding of flexibility of the ICWC activity regarding operation of the whole river water management system.

At the same time, the existing legal instruments do not frame particular mechanisms and conditions for modification or correction of the water allocation criteria and principles and the reservoir operation regimes under the longer timeframe. They also do not require any periodical review of water allocation systems as a whole to detect and timely address its possible deficiencies. This complicates making effective and unbiased decisions for adaptation to changing conditions.

ICWC practices under extremes (droughts and floods) are reactive rather than proactive

Measures to be taken under extreme situations received little attention in regional treaties. In fact, the ICWC bodies have to be guided by two instructions only that address high and low water level situations:

- "In case of extremely low-water years, a specific decision shall be made on water supply for the areas suffering from severe water scarcity." (Article 4, Almaty Agreement)
- "If water availability in the Amudarya River is above the estimated one, excess water, i.e. above the established quantities of water withdrawal must be primarily accumulated by reservoirs, and if flow is very high, a portion of excess water must be delivered to the lower reaches for improvement of sanitary and epidemiological conditions in the area of Prearalie. If water availability is below the estimated one, water withdrawals of the Republics are to be cut proportionally" (Para.7, Protocol 566 of 1987).

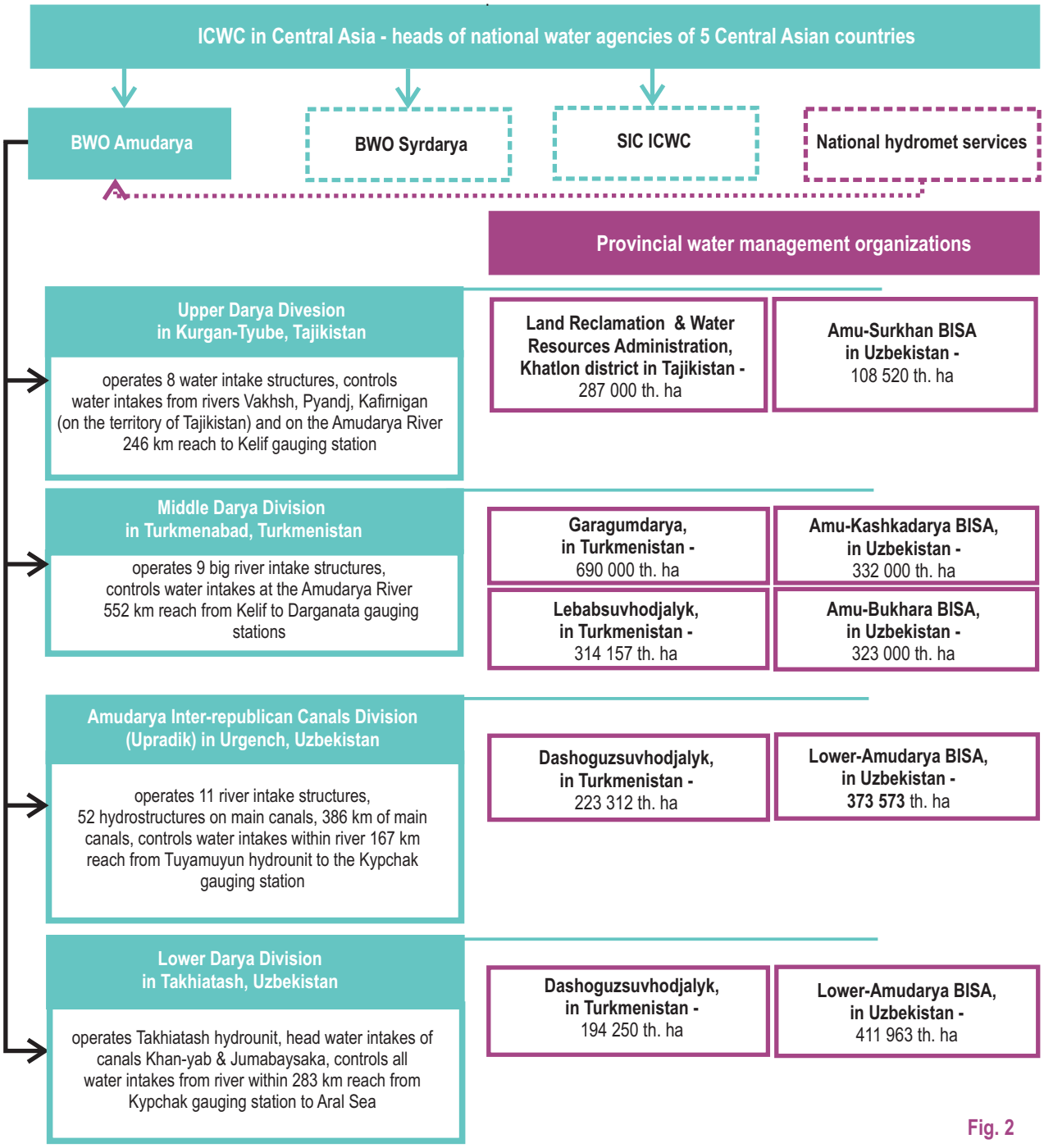

Fig. 2

Over 25 years of its operation ICWC has developed reactive measures as a response to extreme hydrological conditions occurring spontaneously; however, the general level of preparedness to such extremes is rather low and has been further deteriorated due to low reliability of water forecasts and assessments and the lack of the long-term (or, at least, annual) water use planning at the basin level. In this context, the early warning system and clear cut guidelines on appropriate response to expected drought or floods are needed.

Conclusion: way forward

The system of water allocation in the Amudarya basin comprises, on the one hand, elements of flexibility, which is a positive sign for adaptation to climate change, and, on the other hand, is also characterized by rigidity and specificity that, under otherwise equal conditions, should ensure predictable regulation.

The main positive aspect of water management in the Amudarya basin is the availability of the legal instruments and joint organizations mandated to deal with water allocation. This helped the system, which was set up in the Soviet period, to transform without a conflict and adapt at the extent possible to new conditions since independence. The water allocation mechanism of ICWC is far from ideal; nevertheless, over the last 25 years, it has been ensuring water for the Central Asian states, while adapting to changing conditions as far as possible, in particular by on-the-spot adjustment of water allocation depending on "actual water-related conditions".

For the enhancement of adaptability of the water allocation system in the Amudarya basin to changing conditions, there is a need to:

1. Improve compliance with the established water limits in some of river reaches for stable and equitable water supply of the lower reaches and the delta, especially in the years when flow conditions are below the average.

2. Revive the practice of attendance of ICWC meetings by representatives of Karakalpakstan and Kzyl-Orda province, Kazakhstan as those who defend the interests of the Aral Sea and Prearalie that were defined as independent water users at the ICWC meeting of June 8-9, 1993.

3. Increase reliability of forecasts, the low quality of which is the main factor of uncertainty and poor preparedness to droughts and floods. The analysis of reliability of Amudarya flow forecasts since 1991 till 2001 showed that the forecasts for the growing season were true in 4 out of 10 cases, whereas those for the non-growing season have never been correct!

4. Develop and put into action concrete mechanisms and conditions for modification or correction of water allocation criteria and principles and of reservoir operation regimes, as well as the requirements for periodic review of the water allocation procedure. Lack of such provisions complicates decision making for adaptation to changing needs.

5. Aim cooperation on water sharing in the basin at the balanced use of water in the long-term on the basis of ecosystem approach, besides solution of short-term tasks. Water accounting and water saving are still not the priorities of regional cooperation. Moreover, no clear cut restrictions are available concerning operation regimes, water delivery, equitability of water distribution and quality of water monitoring. In April 2014, a Plan on strengthening ICWC activities was adopted. This Plan included four key directions, such as water saving, integrated water resources management as a tool of green growth and adaptation, better quality and accuracy of water accounting, and building capacities of regional and national institutions through information system development and training. However, till now the implementation of these activities has not been started due to lack of financing by the states and development partners. Moreover, in order to ensure "climate resistance", performance of the water management system should be concentrated also on the long-term regulation for compensation of flow variations resulting from climate change.

This Policy Brief is prepared as part of the Project "Transboundary water management adaptation in the Amudarya basin to climate change uncertainties".

The Project objective is studying in a holistic manner transboundary water management issues in the Amudarya basin for the long run under conditions of climatic and other changes along with the national plans on irrigated agriculture and hydropower development.

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Contact information

Scientific-Information Center ICWC

Address: 11, Karasu-4, Tashkent, 100 187,
Republic of Uzbekistan
Phone: (998 71) 265 92 95, 266 41 96
Fax: (998 71) 265 27 97
vdukhovniy@gmail.com
sic.icwc-aral.uz www.cawater-info.net