

Water allocation in transboundary basins: A global workshop on the status and good practices
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Historic water allocation in the Amudarya basin: achievements and challenges



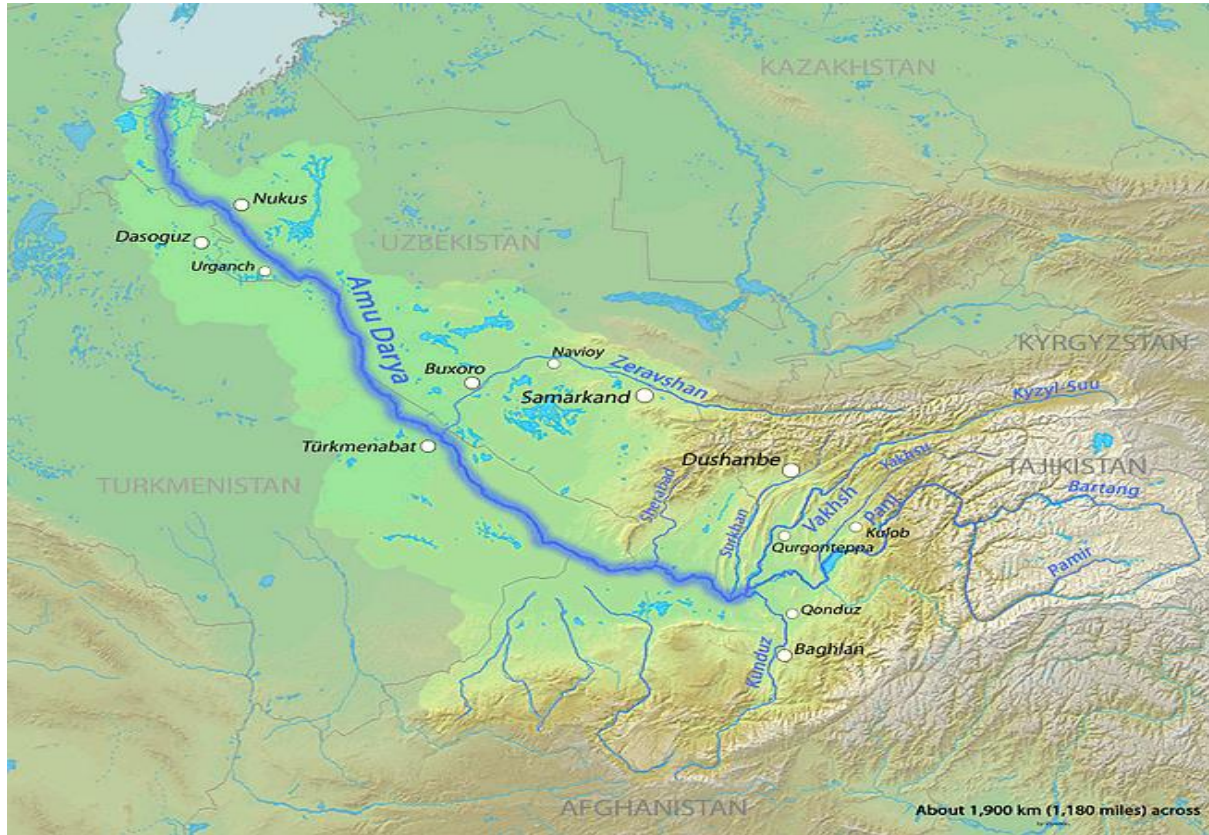
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Water Coordination in Central Asia



Research project under «Partnerships for enhanced engagement in research” Cycle 4: Transboundary water management adaptation in the Amudarya basin to climate change uncertainties

Amudarya basin and its key challenges



Annual runoff: 74.2 km³/year. **Catchment area:** 309,000 km².

Riparians: Afghanistan (~13%), Kyrgyzstan (2%), Tajikistan (74%), Turkmenistan (1.7%) & Uzbekistan (8.5%).

Flow regulation: Nurek, Tuyamuyun, small reservoirs.

Construction: Rogun.

Diminishing supply

water quality & climate change (10-15% in Amudarya)

Increasing demand

population growth, economic development, ineffective water use & lack of capital investments, projected water use by Afghanistan

Conflicting interests

agriculture/hydropower/ecosystem; upstream/downstream; geopolitics

Ensuring water for all

Changes in river flows in the basin

OVER LAST 15 YEARS

- Runoff of rivers in the Amudarya basin **declined** by 2% from average annual flow observed
 - Pyandzh runoff decreased by **7%**
 - Vaksh runoff increased by **5%**.
- Increase in **frequency** of
 - low water years (об. 75% & higher) **1,3** times
 - high water years (об. 25 % & lower) **1,2** times
 - extreme high water years (об.10 % & lower) **2,5**.
- **Severity** of extreme dry years increased by 1.5 times (deviation of the average flow in dry years from the average flow for the given period)

TREND TILL 2050

- Decrease of water availability in **growing** season (*moderate warming scenario*) :
 - Vaksh – by 5%,
 - Surkhandarya – by 6%,
 - Kafirnigan – by 8%
 - Zarafshan – by 11%
- Decrease in water availability in **summer** months up to **15..35%**

Legal and institutional basis for water allocation
in the basin

Legal basis

1992 Almaty Agreement

'respects the existing pattern and principles of water allocation'
'be governed by current regulations for water allocation'

1987 Protocol No 566

Scientific-Technical Council of the Ministry of Land Reclamation & Water Management of the USSR approves "Revised Scheme of Integrated Use & Protection of Water Resources in the Amudarya basin"

1987 - Water Management Administration for the Amudarya established (later BWO)

Rules:

- **Status quo** on water allocation
- Water resources of interstate sources are common & integral
- Equal rights & responsibilities

Institutions:

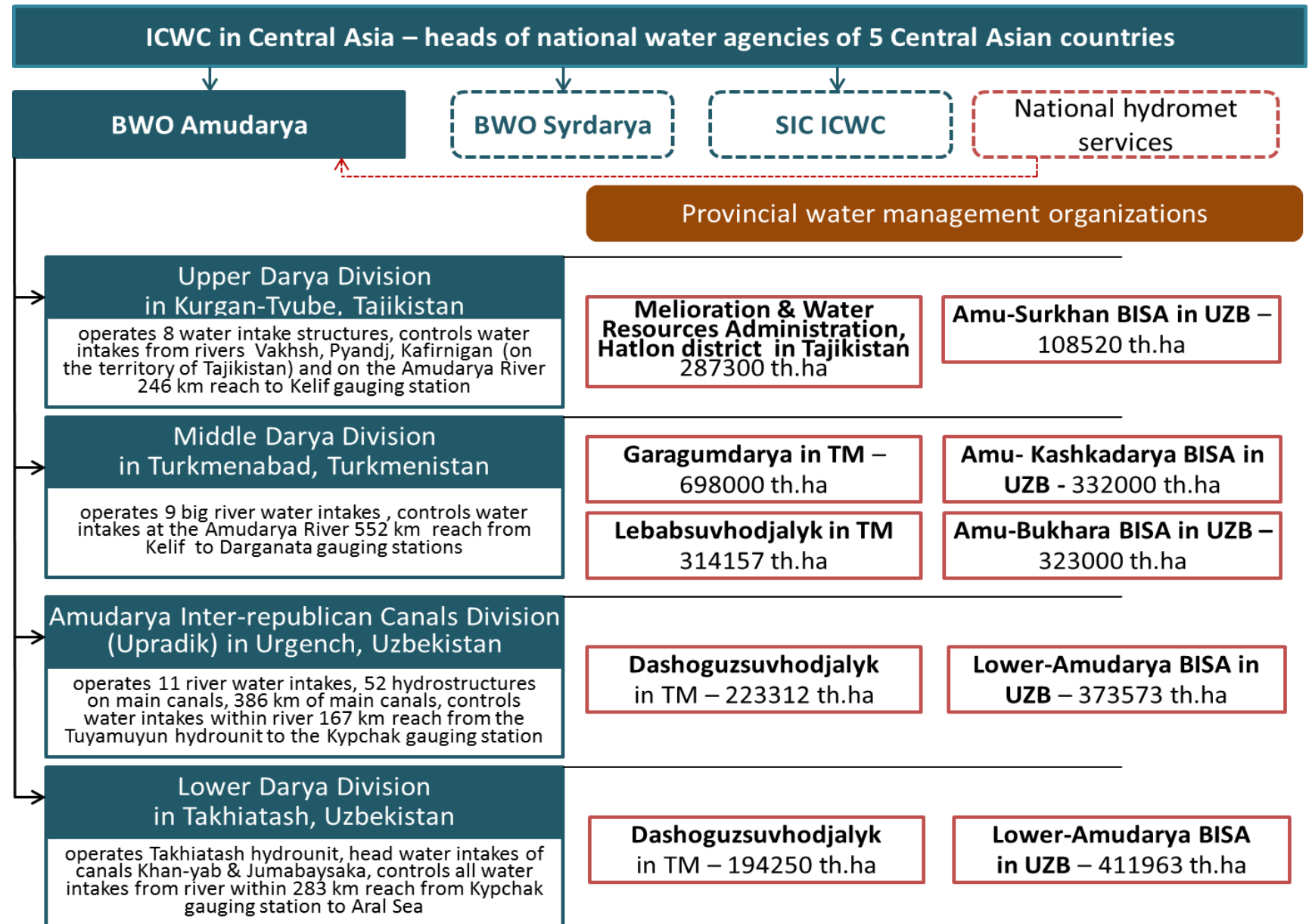
- Interstate Commission for Water Coordination in CA
- BWO Amudarya

Other arrangements

- 1993 Kzyl-orda Agreement
Inflow to the Aral Sea to 'sustain its ecologically acceptable levels +IFAS'
- 1999 IFAS Agreement
- Bilateral instruments:
 - TM & UZB (1996, 2007, 2008, 2017)
 - AFG & TJ (2004, 2010)

Institutional framework

ICWC
BWO
territorial units



Agreed water allocation

Water allocation set on the basis of the countries' historical and present water use, the area of irrigated land in use, and estimated unit water use against the level of full water exhaustion (Protocol 566)

Withdrawal limits for basin countries

Kyrgyzstan – 0,6%
Tajikistan – 15,4%
Turkmenistan – 35,4%
Uzbekistan – 48,2%

Reservoir operation regimes

Growing & non-growing seasons

Inflow to the Aral (deltas) and the Priaralie

Sanitary flow - 3.15 км³/year

Afghanistan's share (2.10 км³/year) taken from 'available water resources'

Allocation practices (1/3)

Withdrawal limits for basin countries

% of actual allocation vs limits along reaches in the driest years

Dry years	Upstream (TJ/UZ)	Middle stream (TM/UZ)	Down-stream (TM/UZ)	River Delta
2000 (72%)	84	83	48	20
2001 (69%)	97	92	50	5
2008 (58%)	92	91	45	21

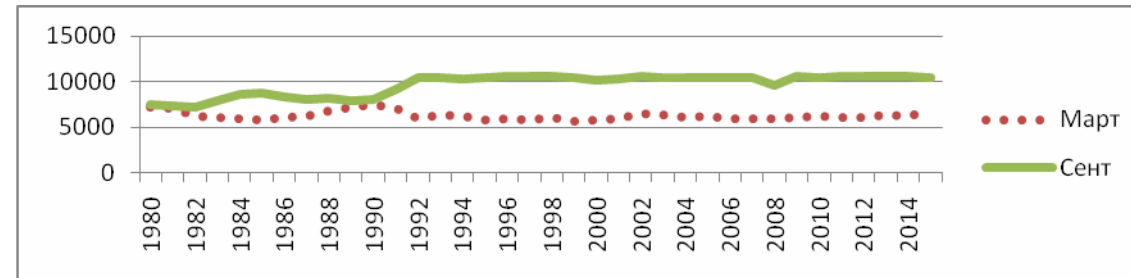
Allocation in 1991-2015

Country	Plan	Fact	Over limit (>1-2km ³)	Below limit (>4km ³)
Tajikistan	9,3	7,5 ↓	-	
Turkmenistan	21,5	20,2 ↓	1995-6, 2001-2	1999-00, 2000-01, 2007-08, 2008-09, 2010-11
Uzbekistan	22,5	21,5 ↓	1995-6, 1997-9 (winter)	1999-00, 2000-01, 2007-08, 2008-09, 2010-11

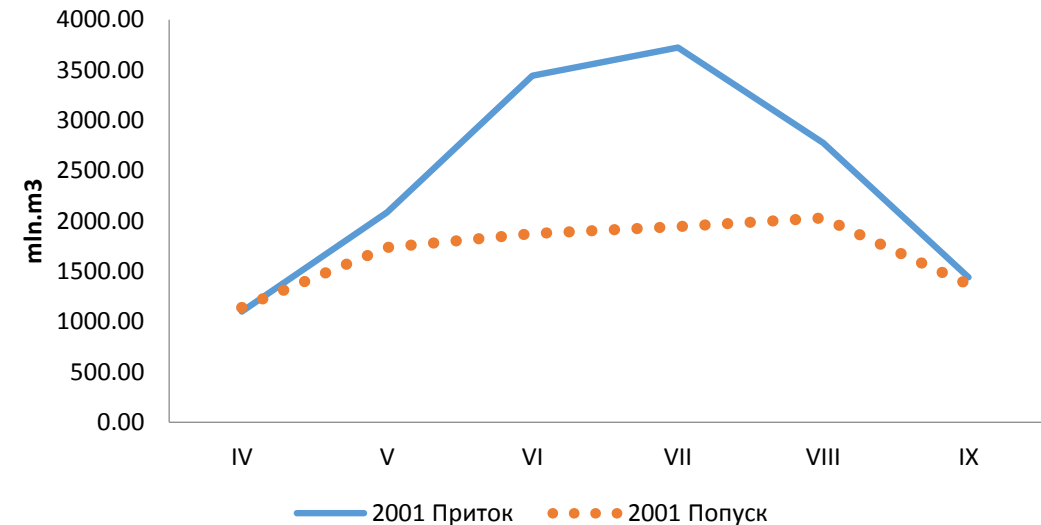
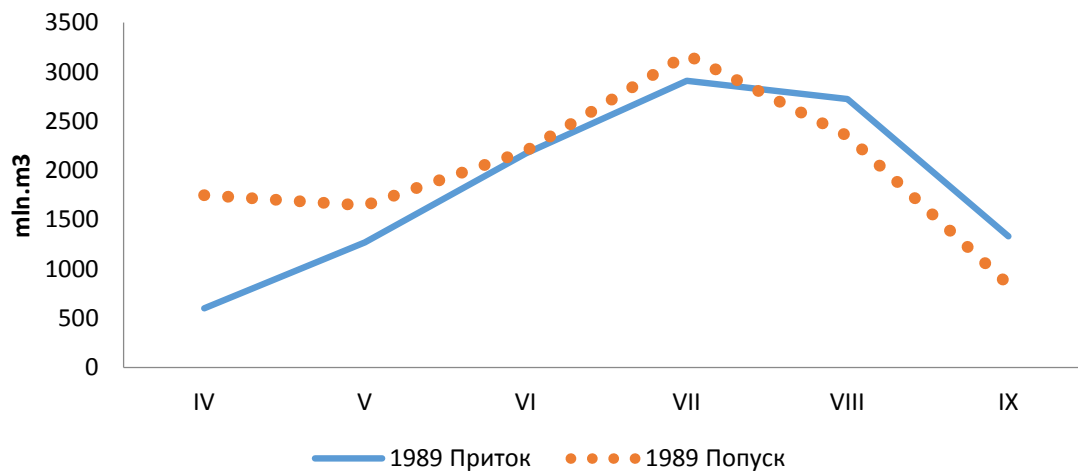
Allocation practices(2/3)

Reservoir operation regimes

Water volume in the Nurek by start (March) and end (September) of growing season, 1980 - 2015



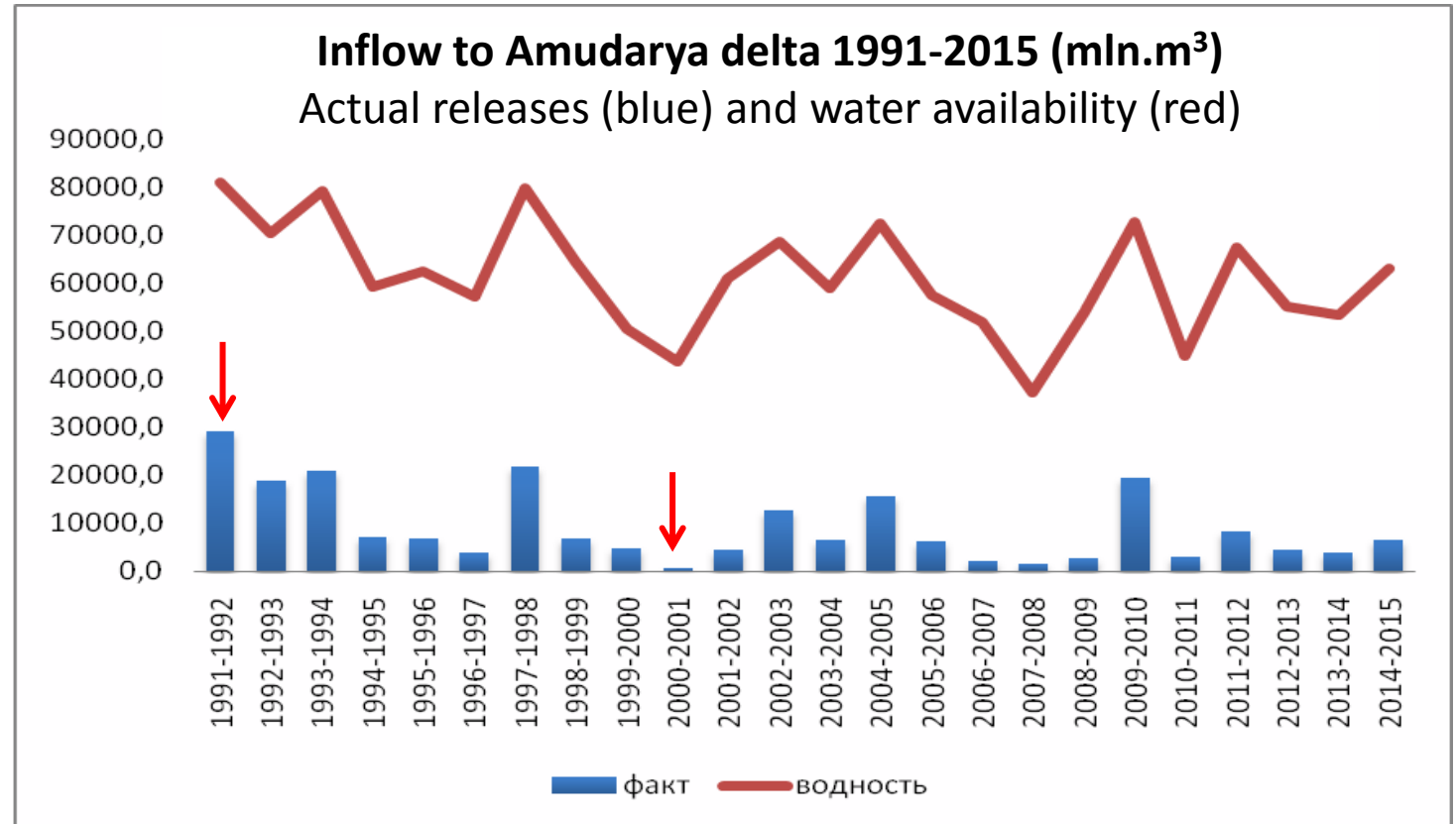
The Nurek operation in dry growing seasons of 1989 & 2001



Allocation practices(3/3)

Inflow to the Aral (deltas) and the Priaralie

- 8 km³ in average – **good**
- No stability:
 - 1991-92 -29,1 km³
 - 2000-01 – 0,5 km³
- Min. flow (3.1 km³) was not provided in 2006-09



1. Flexibility of principles
2. Operational responsiveness
3. Modifications and revisions
4. Emergency response

Is the water allocation system in the Amudarya adaptable to changes?

Adaptability to changes: key findings (1/2)

1. **Availability of agreements & institutions to deal with water allocation**

- Helped the system, that was set up in the Soviet time, peacefully transform and operate 25 years despite all difficulties

2. **Allocation is flexible (shares in %) and specific (proportional reduction)**

- Guarantees water supply for each country and accounts changes in hydrological conditions.

3. **Allocation criterion is fixed (irrigation priority), revision uncertain, no periodic review**

- Hinder responsiveness in decision making.

4. **BWO adjusts allocation, $\pm 10\%$ within the agreed limits, under certain conditions (changed water availability, water mgt situation, extreme events)**

- Helps react on-the-spot
- Implementation challenge to ensure proportionality at river reaches, esp. in low water years.

Adaptability to changes: key findings (2/2)

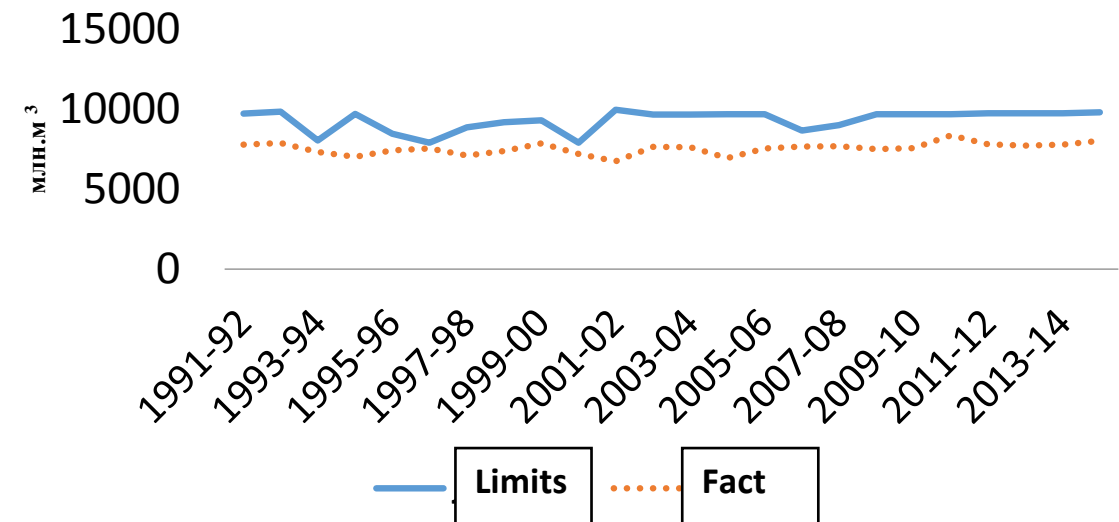
5. Water limits are guaranteed even if not used (stability), no provisions for possible suspension or transfer

- Essential for long-term investment and possible reduction in water withdrawals.
- The system would benefit from more clarity in cases when water limits are not used.

6. Responses to extreme events (high/low water years) reactive rather than preventive

- Reactive actions include on-the spot adjustment of limits and regimes, awareness raising seminars, strict water discipline, regular meetings of special technical groups, joint monitoring and control at gauging stations
- The system would benefit from improved forecasting and early warning system, annual and long-term planning, coordinated multi-year flow regulation, sound strategies and procedures to deal with droughts and floods

Annual withdrawals of Tajikistan (limits & fact) 1991-2015



Lessons learned

1. Joint **institutions** help to overcome even dramatic political changes in a peaceful and practical way (*25 years of cooperation*)
2. Everyday **technical interactions** between riparians are instrumental
3. A mix of **flexibility & rigidity** in the system can provide for predictable *and* adaptable regulation
 - *Rules and procedures should be flexible to allow for swift response in unusual situations but also clear and straightforward to avoid misinterpretations*
4. Clearer provisions for **modification, adjustment and revision** of the water allocation could improve its responsiveness
5. Reliable **forecasts** and timely **information** exchange are the key (*Shared information space*)
6. More attention to basin-wide (long-term) **planning** and **stakeholder engagement** is needed
7. Looking **together into the future** – scenario, modeling, research, action plans
 - *Action plan to strengthen ICWC has 4 directions: 1) Water saving, 2) IWRM, 3) Water measurement, 4) Capacity development*
8. Improvement of the system should build on **what is working** and rely on **homegrown** institutions and **international law**



International Conference
**Water cooperation in Central Asia marks 25 years:
Lessons learned and tasks for the future**
Tashkent | November 2017

Thank you

Learn more

http://cawater-info.net/projects/peer-amudarya/about_e.htm