

CAWAMNET Workshop - Central Asian Water Conflict and Migration Network
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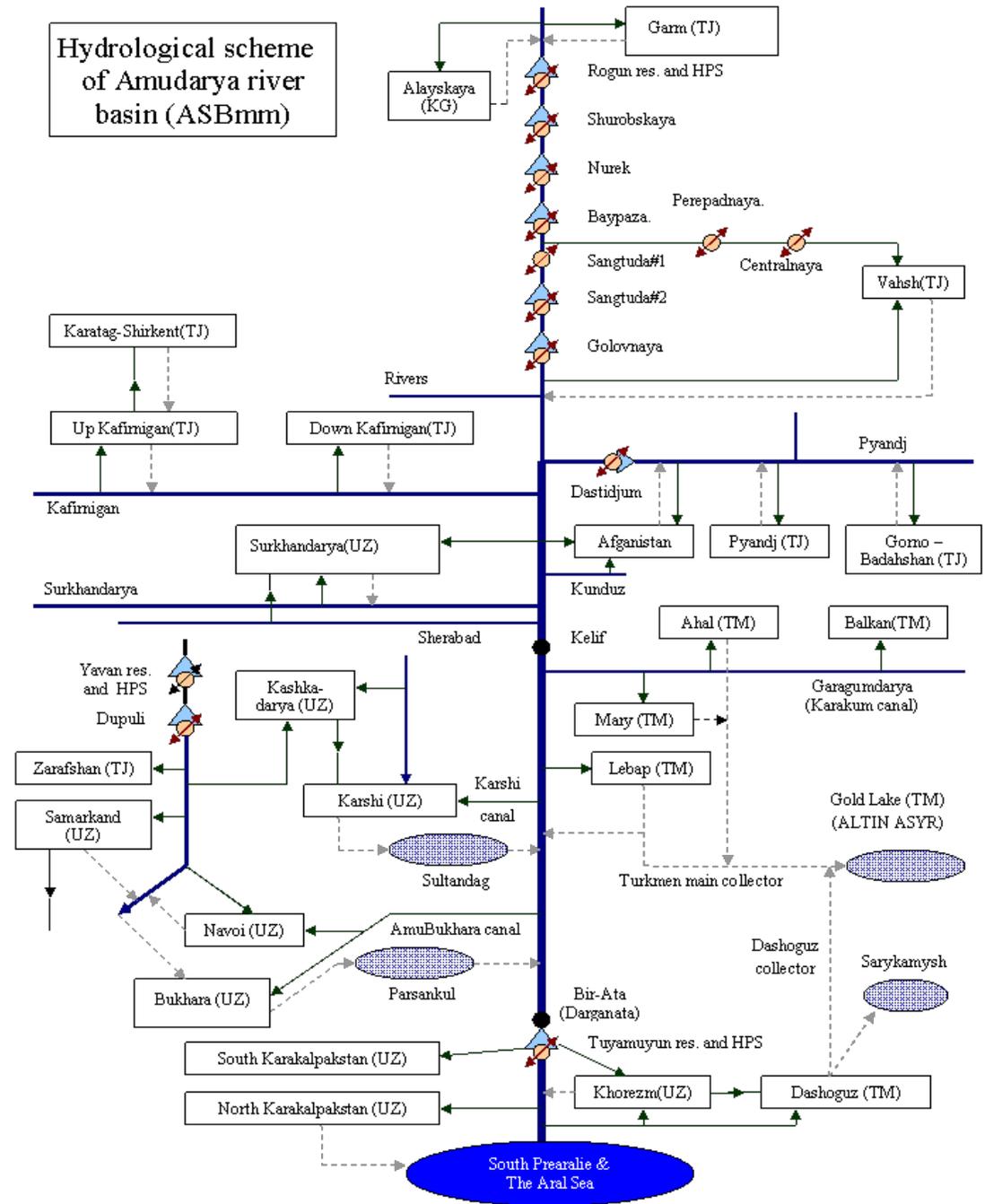
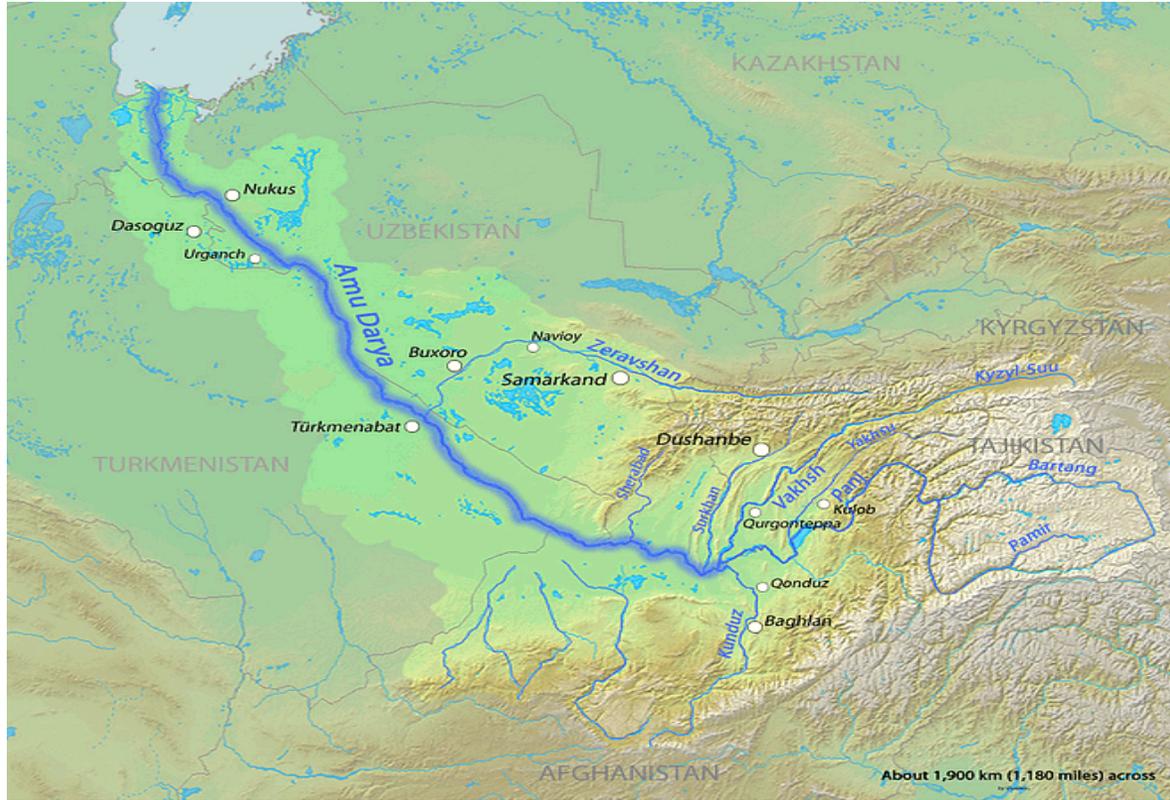
Lessons for adaptation policies from 30 years of transboundary water allocation in Amudarya



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Small Amudarya basin



Annual runoff: 52. 8 km³/year (2016-2022) - Amudarya River and its major tributaries (Vakhsh, Pyanj, Kafirnigan, Kunduz, Syrhandarya)

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

Flow regulation: Nurek, Tuyamuyun, small reservoirs.

Construction: Rogun in TJ, Kush-Tepa in AFG

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%**.
- Decrease 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 (*average 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 framework

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

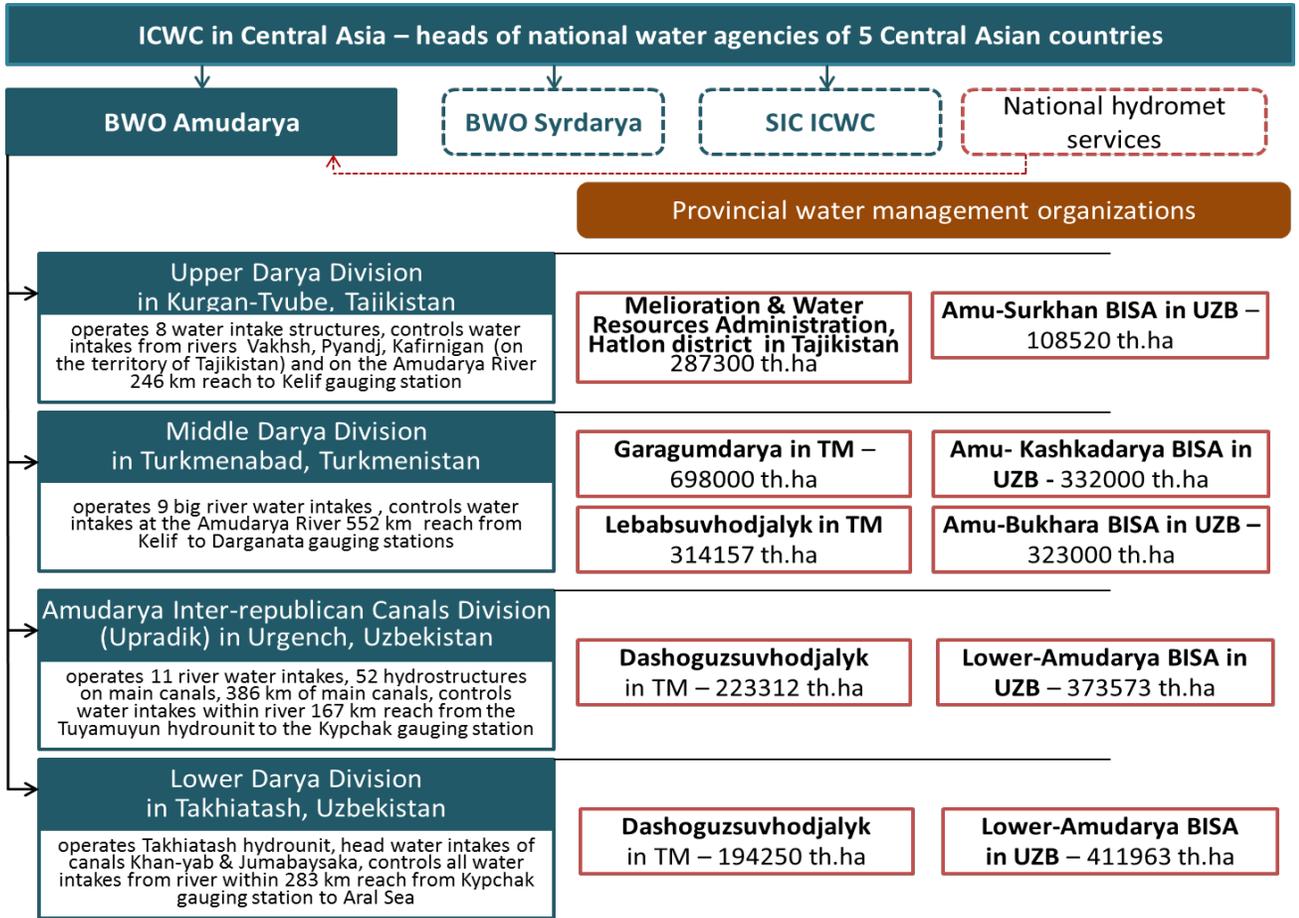
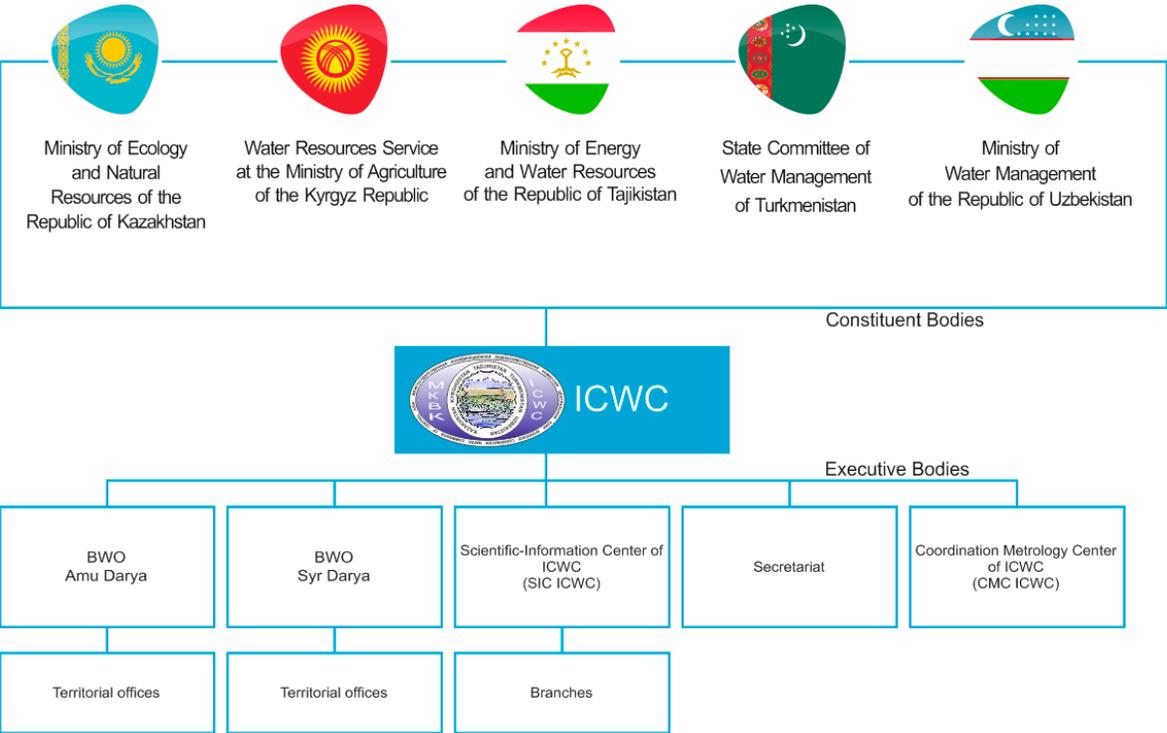
Institutions:

- 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, 2022)
 - AFG & TJ (2004, 2010)

Institutional framework



System adaptability

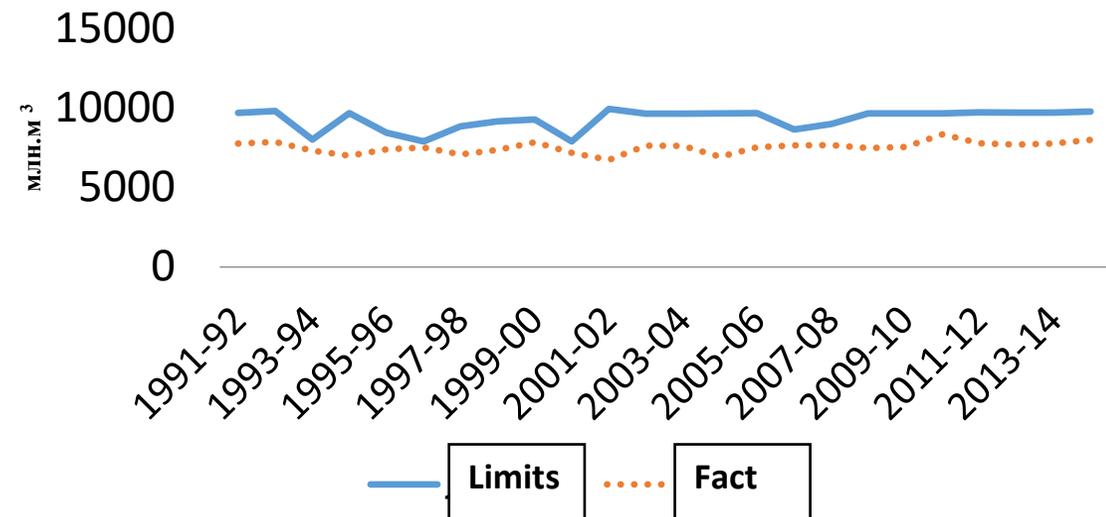
- Flexibility and rigidity
- Operational responsiveness
- Modifications and revisions
- Emergency response

Transboundary water allocation features

A mix of Flexibility and Rigidity in the system can provide for predictable and adaptable regulation

- Water allocation set in percentages and changed proportionally based on actual water availability and hydrological conditions provides **security of water supply for all countries**
- 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.
- Allocation criterion is **fixed** (irrigation priority), revision uncertain, no periodic review - hindered resilience and raised equity concerns.

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



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)

Operational responsiveness

- **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.
- **Better forecast, water accounting and automation** could improve its responsiveness
- **Responses to extreme events (high/low water years) reactive rather than preventive**
 - The ICWC practices exhibit **high ad hoc adaptability** to changing conditions but lack a long-term coordinated strategy to deal with variability and changes.
 - Reactive actions include on-the spot adjustment of limits and regimes, awareness raising seminars, 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

Proportional division along river reaches was a challenge

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

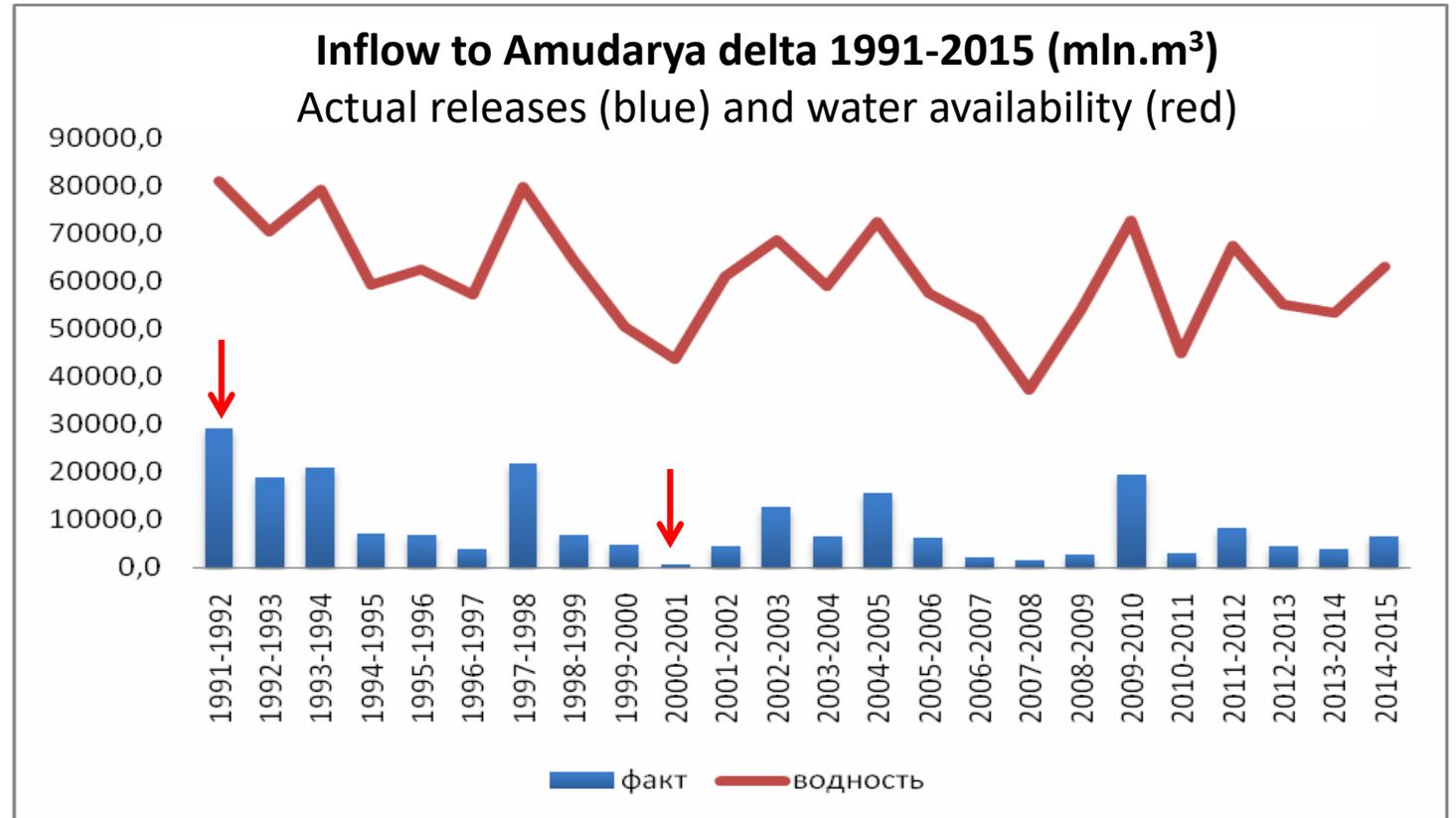
Allocation in 1991-2015

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

Ecosystems receive low priority

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



- Joint bodies and cooperative arrangements provided for the **continuity and stability** of transboundary water management in times of dramatic political, social and economic transformations.
- The **resilience** of the system is supported by a **treaty-based** flexible and specific water allocation formula (percentage of flow) and by the operation of **joint bodies** mandated to deal with water allocation, taking into account actual water availability and water-related conditions.
- But they but were not perfect, signaling the need to better prepare for the future.

The key areas for improvements:

- joint vision and strategic planning
- enhanced legal frameworks and institutions toward a whole-basin approach and improved multi-year flow regulation
- data, information and capacity
- promote evidence-based decision-making
- enable multi-sectoral and participatory governance arrangements,
- harvest the possibilities offered by infrastructure, technology and innovation
 - Nature-based solutions (wetlands) and sustainable infrastructure (88% of all adaptation costs - 54% in the water sector)
 - Advance irrigation and energy efficiency technologies. Renewables. Partnerships. Remote sensing technologies. Use of collector-drainage waters
 - **Financial measures.** Water saving incentives, independent energy audit system. Attractive bank loans. Tax policies, PPPs. Attract climate smart investment
- more prominent attention to water quality and environmental degradation and recognizing multiple facets and values of water.