Adapting to climate change in the Amudarya basin: dealing with droughts...
Amudarya

**Annual runoff:** 79.4 km³/year. **Catchment area:** 309,000 km².

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

**Flow regulation:** Nurek on Vakhsh (total capacity 10.5 km³), Tuyamuyun on Amudarya (total capacity 7.3 km³), a network of small reservoirs & canals. **Proposed large facilities:** Rogun on Vakhsh & Dashtidjumn on Pyandzh.
Climate change impacts in the Amudarya
Assessment of climate change effects on river flow and flow hydrographs according to PEER/ASBmm – REMO 0406 for 2016—2055
Droughts in the Amudarya

Droughts are increasing in frequency, severity & duration:
- Frequency of dry years increased by **1.3 times** from 1991 to 2008
- Severity of highly dry years increased by **1.5 times** (deviation of the average flow in dry years from the average flow for the given period)

Runoff during the dry years in Amudarya may **decrease for 25-40%** by 2050

Intensified by **uncoordinated flow regulation**

**The Nurek Reservoir operation in dry growing seasons of 1989 & 2001**

[Graph showing flow variations in 1989 and 2001]
**Water allocation in the driest growing seasons**

% of actual water allocation against agreed limits – along river reaches

<table>
<thead>
<tr>
<th>Dry years</th>
<th>Upstream (TJ/UZ)</th>
<th>Middle stream (TM/UZ)</th>
<th>Downstream (TM/UZ)</th>
<th>River Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 (72%)</td>
<td>84</td>
<td>83</td>
<td>48</td>
<td>20</td>
</tr>
<tr>
<td>2001 (69%)</td>
<td>97</td>
<td>92</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>2008 (58%)</td>
<td>92</td>
<td>91</td>
<td>45</td>
<td>21</td>
</tr>
</tbody>
</table>

% of water received by countries against agreed limits

Kyrgyzstan – 2.2%  
Tajikistan – 94%  
Turkmenistan – 72%  
Uzbekistan – 63%
Response to droughts reactive, not proactive

Lack of institutional flexibility, low level of preparedness → higher vulnerability:

• Countries & regional institutions react to droughts when these occur (awareness seminars, strict water discipline, etc) but do little at regional scale to prevent them;

• Poor forecasting accuracy is the main cause of poor preparedness & uncertainty;

• Lack of long-term planning reduces climate-resilience of the whole system;

• Lack of sanctions or other provision for violation of agreed water allocation regime.

Need for drought management plan or strategy under ICWC:

• No concerted efforts at the regional level to initiate a dialogue on the adoption of drought management plans that would provide a framework for a proactive, risk-based management for dealing with droughts, including comprehensive monitoring, information & early warning systems, impact assessment procedures, risk management measures, etc
Research project under «Partnerships for enhanced engagement in research (PEER)” Cycle 4: Transboundary water management adaptation in the Amudarya basin to climate change uncertainties

Learn more on the project that seeks to build adaptive capacity of the countries sharing the Amudarya basin to manage effectively their transboundary waters under climate change and other uncertainties at http://cawater-info.net/projects/peer-amudarya/about_e.htm