

14th International Conference "Europe-INBO 2016"  
Lourdes - France - 19 - 22 October 2016

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



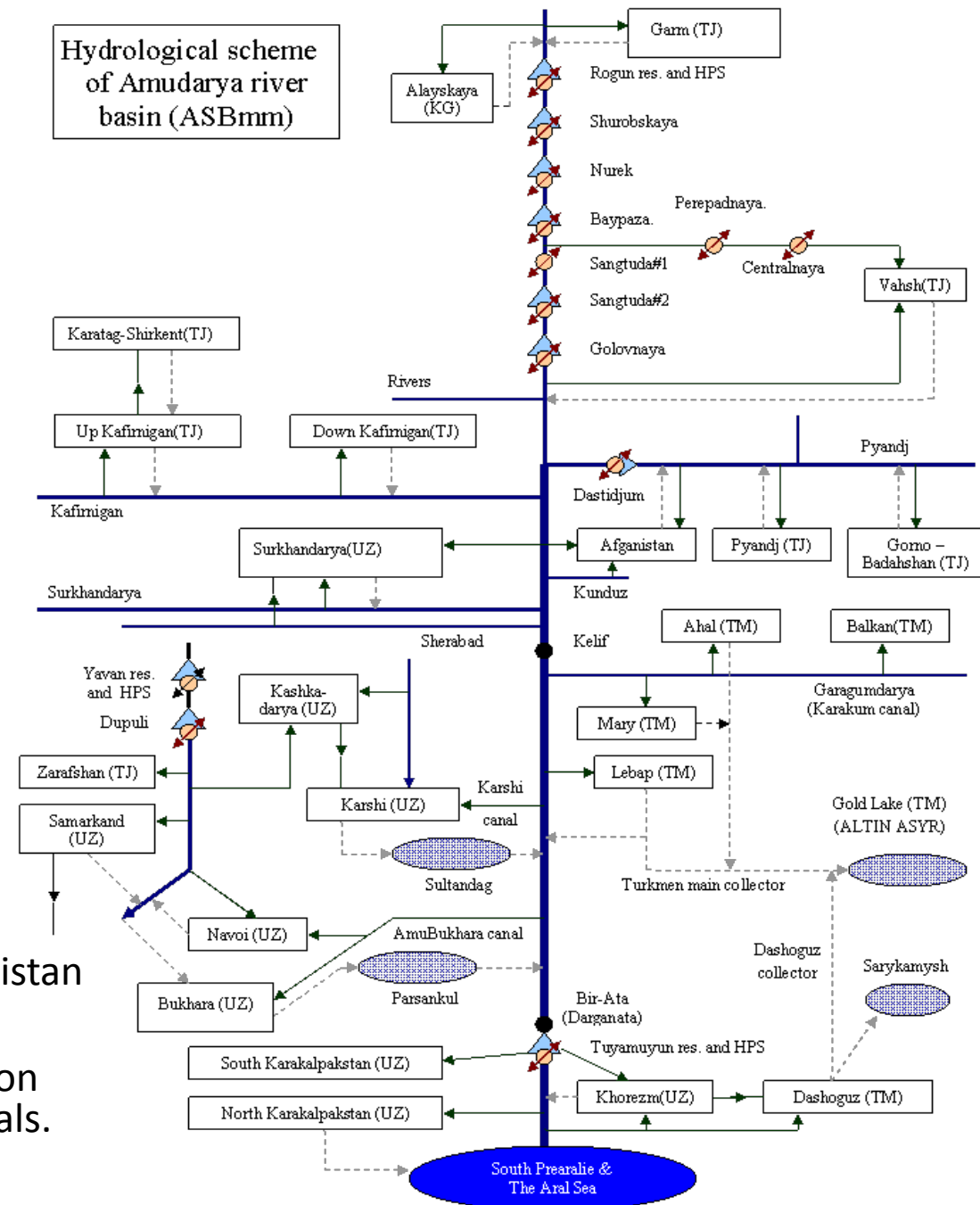
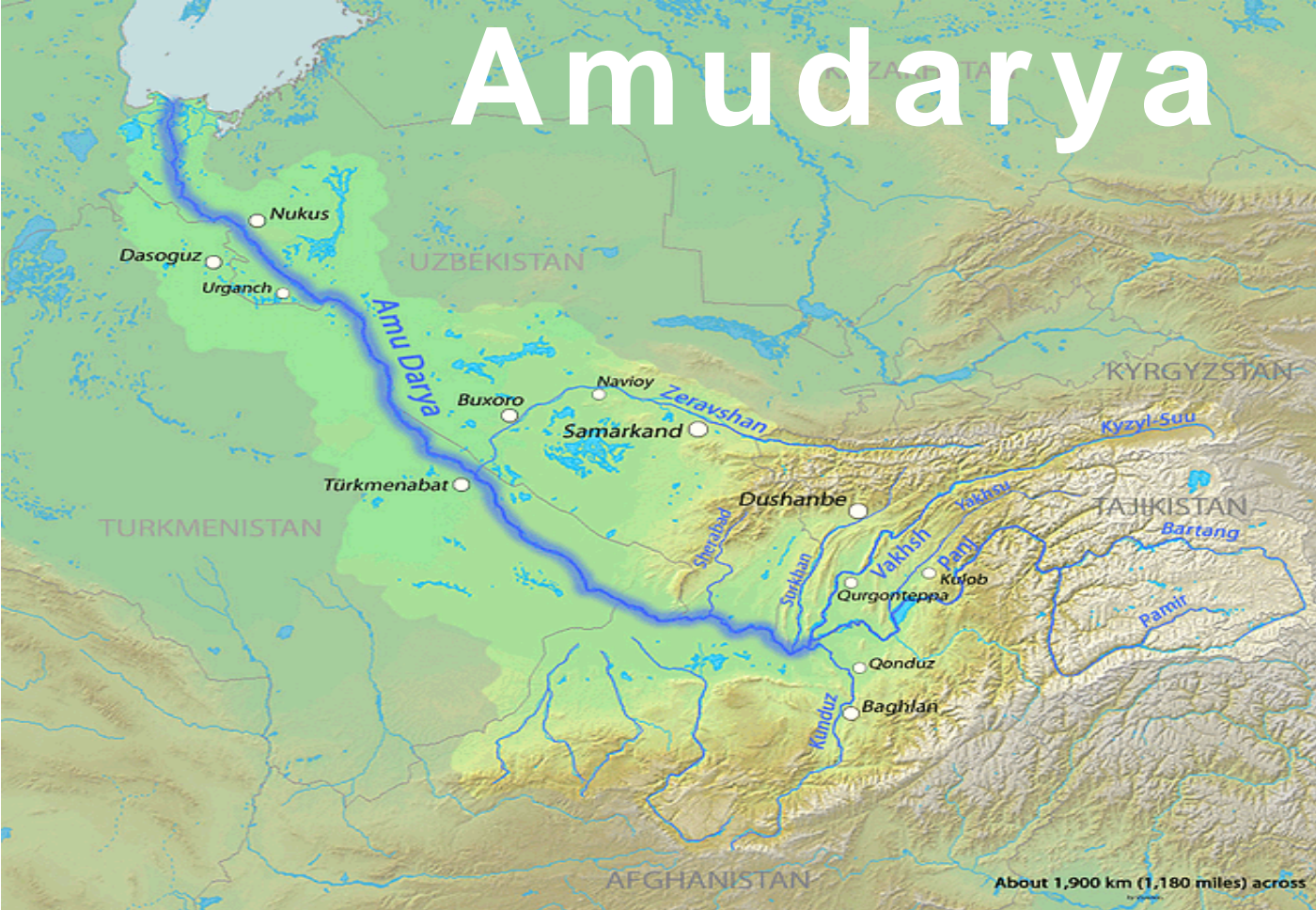
## Dinara Ziganshina, PhD

Scientific Information Center of Interstate  
Commission for Water Coordination in Central Asia  
Member of the Implementation Committee under  
the UNECE Water Convention



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

# Amudarya



**Annual runoff:** 79.4 km<sup>3</sup>/year. **Catchment area:** 309,000 km<sup>2</sup>.

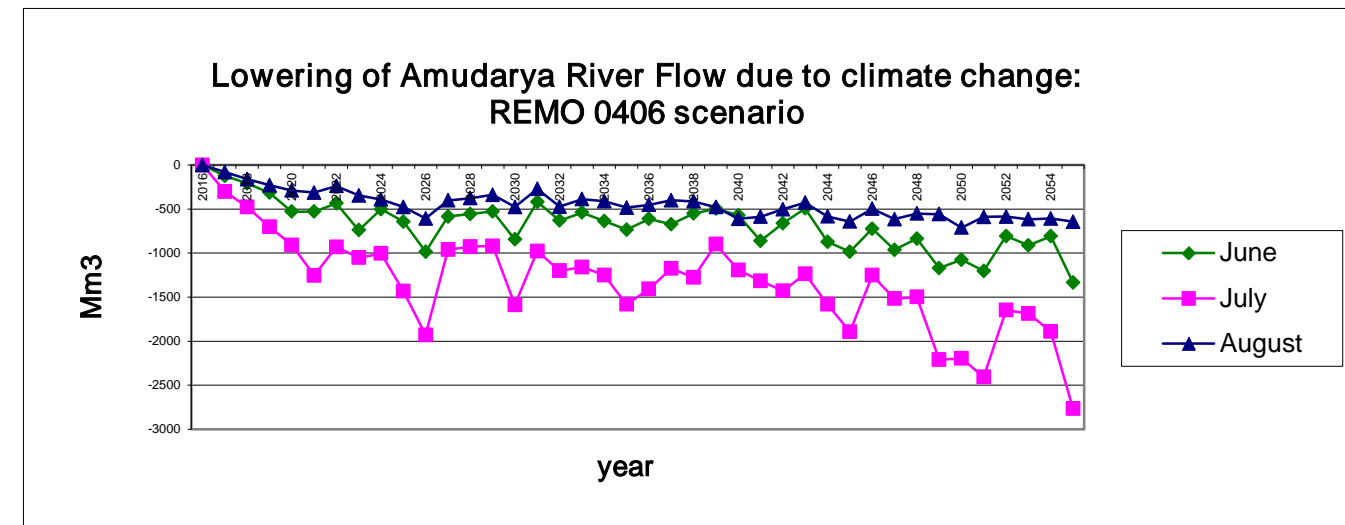
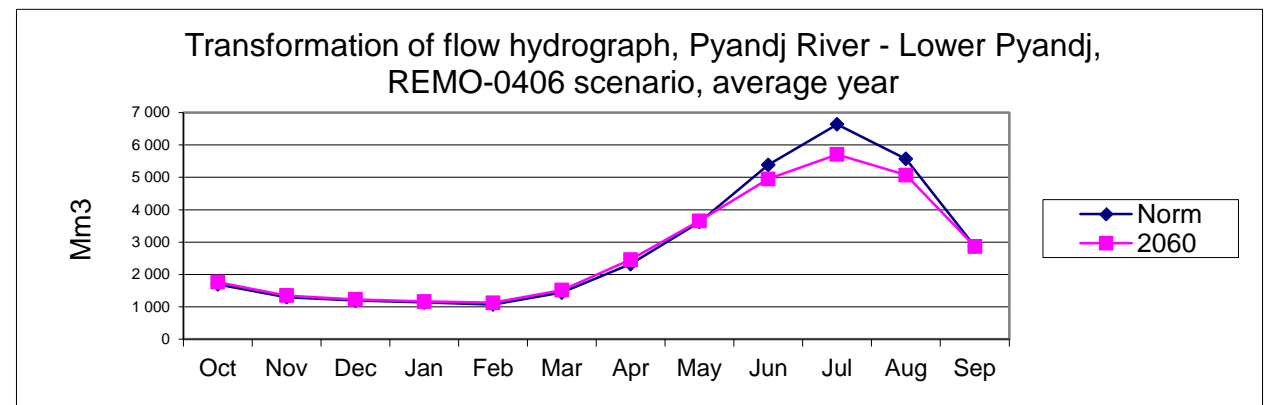
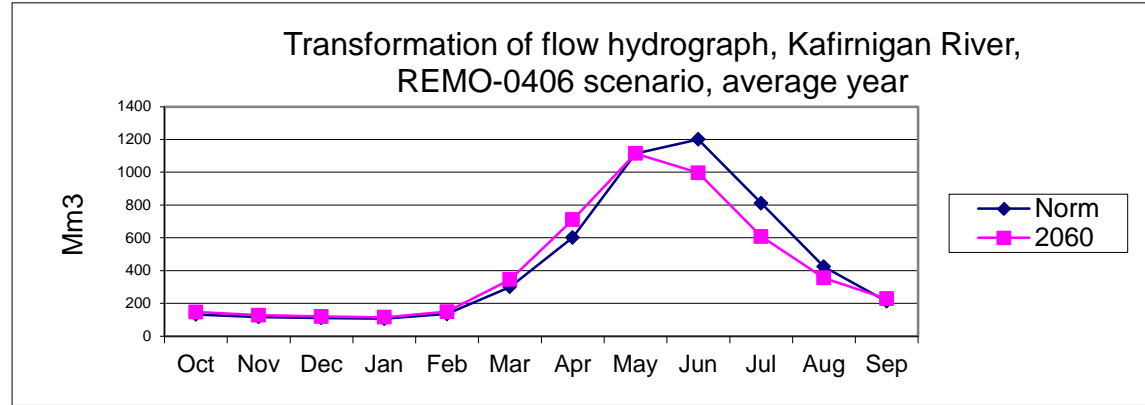
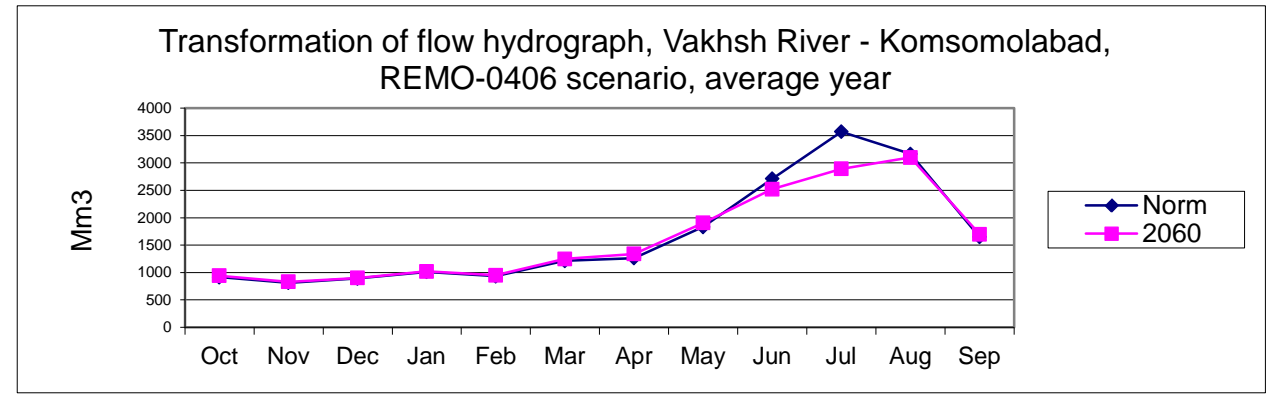
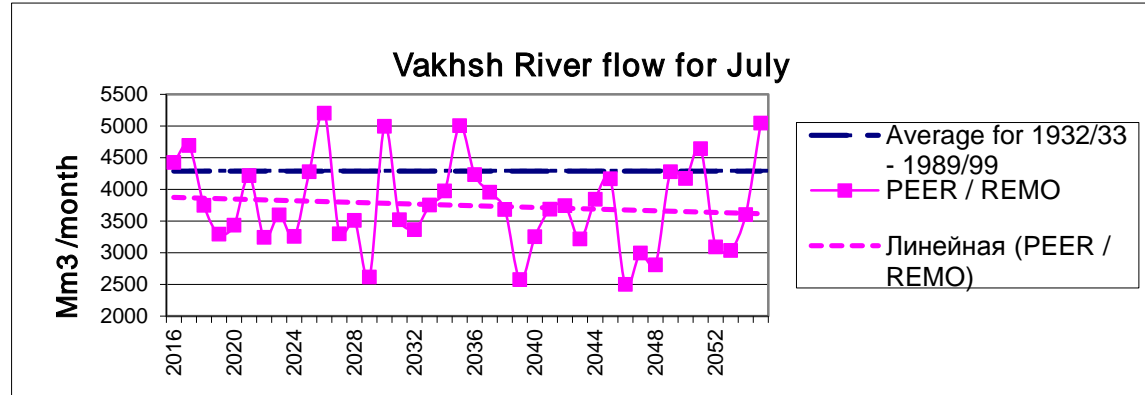
**Riparians:** Afghanistan (~13%), Kyrgyzstan (2%), Tajikistan (74%), Turkmenistan (1.7%) & Uzbekistan (8.5%).

**Flow regulation:** Nurek on Vakhsh (total capacity 10.5 km<sup>3</sup>), Tuyamuyun on Amudarya (total capacity 7.3 km<sup>3</sup>), a network of small reservoirs & canals.  
**Proposed large facilities:** Rogun on Vakhsh & Dashtidjurn on Pyandzh.

# Climate change impacts in the Amudarya



Sources: Second National Communications on climate change of Tajikistan, Turkmenistan and Uzbekistan; Climate Change in Central Asia: A visual synthesis report (2009); Environment and Security in five regional consultations in Ashgabat (Sep 2007) and Kabul (Nov 2007) and regional field missions (May 2008).



**Assessment of climate change effects on river flow and flow hydrographs according to PEER/ASBmm – REMO 0406 for 2016—2055**

# Droughts in the Amudarya

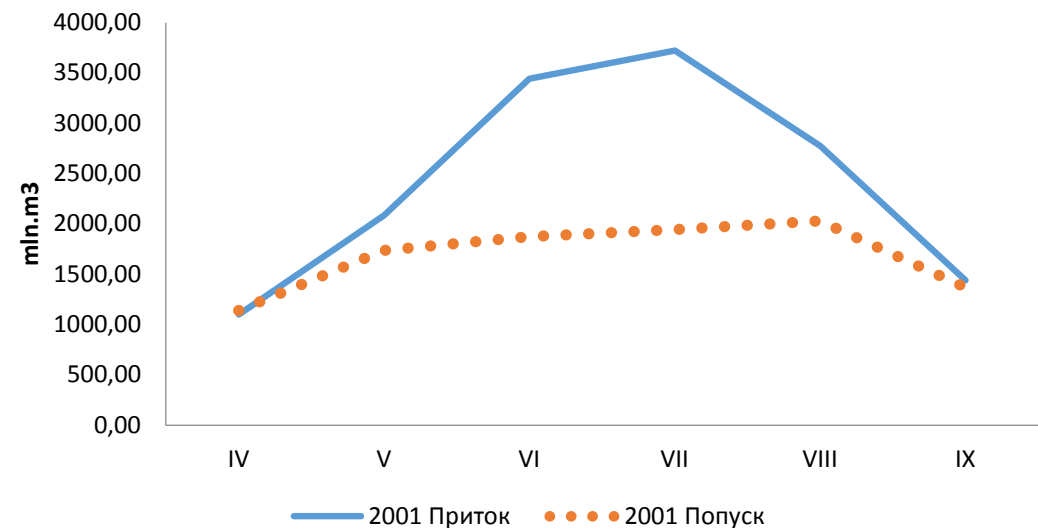
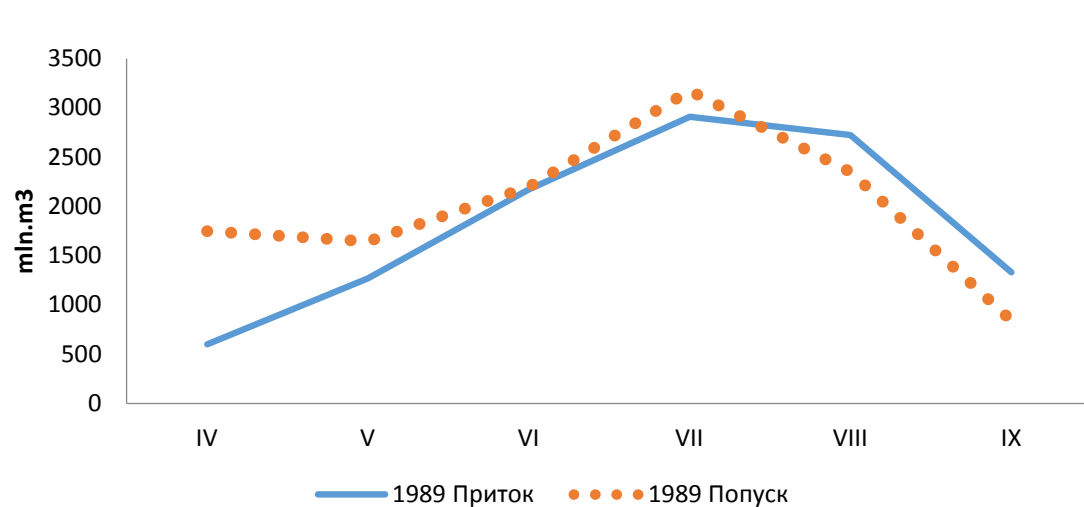
Droughts are increasing in frequency, severity & duration:

- **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



# Water allocation in the driest growing seasons

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

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

## **% 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](http://cawater-info.net/projects/peer-amudarya/about_e.htm)