

# Key Cross-border challenges in the region toward SDGs

Talaibek Makeev, expert





# Definition and citations



Transboundary - moving or having effect across a boundary or boundaries.

<https://www.lexico.com/en/definition/transboundary>



Results show that trade liberalization and cooperation are useful for dealing with transboundary pollution in a shared waterway.



Transboundary water pollution concerns water-borne waste that crosses international political boundaries as a result of natural water flow.



Transboundary projects are also likely to be funded since they provide benefits to both countries

<https://dictionary.cambridge.org/dictionary/english/transboundary>

# Transboundary

---

## Move and objects

## Effects

### Water flow

Main transboundary water bodies:  
Caspian Sea with Kura-Araks and Ural,  
Aral Sea Basin with AmuDaria and  
SyrDaria, Chu-Talas, Balkhash with Ile

Water quantity and quality, water born diseases, degraded ecosystems, floods or drought, swamping or desertification, irrigated agriculture and its area and productivity

### Air mass move

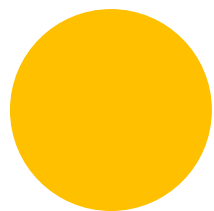
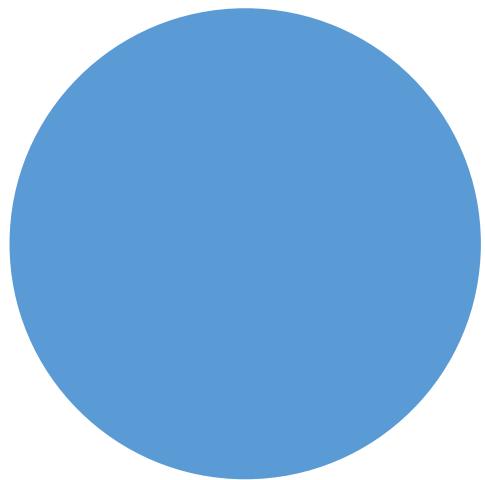
Precipitations, dust and sand storms, long-range air pollution, including by hazardous industrial pollutants, air born diseases

### Ecosystems (habitats and eco corridors, migration routes)

Network of the protected territories, eco corridors and migration routes, increased fragmentation of the ecosystem by fenced boundaries

### Infrastructure – roads, transmission lines, pipelines (oil and gas)

Trade, transit, supplies, travels&tourism and their turnover



# SDG relevant interactive data sources

Transboundary waters'  
case



The <https://www.worldometers.info/>  
is my favorite reference interactive live source today



## Aral Sea Basin



### Geography

Total drainage area (km <sup>2</sup> )	1,218,514
No. of countries in basin	9
BCUs in basin	Afghanistan (AFG), China (CHN), Jammu and Kashmir (CHN/IND/PAK), Kazakhstan (KAZ), Kyrgyzstan (KGZ), Pakistan (PAK), Tajikistan (TJK), Turkmenistan (TKM), Uzbekistan (UZB)
Population in basin (people)	50,052,293
Country at mouth	Kazakhstan, Uzbekistan
Average rainfall (mm/year)	277

### Governance

No. of treaties and agreements <sup>1</sup>	12
No. of RBOs and Commissions <sup>2</sup>	4

### Geographical Overlap with Other Transboundary Systems (No. of overlapping water systems)

Groundwater	
Lakes	26
Large Marine	
Ecosystems	0

## Kura-Araks Basin



### Geography

Total drainage area (km <sup>2</sup> )	190,033
No. of countries in basin	6
BCUs in basin	Armenia (ARM), Azerbaijan (AZE), Georgia (GEO), Iran (Islamic Republic of) (IRN), Russian Federation (RUS), Turkey (TUR)
Population in basin (people)	14,462,042
Country at mouth	Azerbaijan
Average rainfall (mm/year)	519

### Governance

No. of treaties and agreements <sup>1</sup>	5
No. of RBOs and Commissions <sup>2</sup>	1

### Geographical Overlap with Other Transboundary Systems (No. of overlapping water systems)

Groundwater	
Lakes	6
Large Marine	
Ecosystems	0



- by using a common risk categorization narrative for all indicators, the results profile of a basin can be analysed across the full suite of indicators.

The assessment has defined categories of relative risk to be applied to all indicators as follows:

**Table 2.3 Risk Categorization Approach**

Relative Risk Category
1 - Very low
2 - Low
3 - Moderate
4 - High
5 - Very high

The principle of *relative* risk is used here since the assessment is intended to be not a detailed basin-by-basin study but an overarching assessment which allows for the direct comparison of the situation between basins. Risk here refers to the risk to either humans or ecosystems for the particular issue the indicator represents within the transboundary basin context.



TWAP RB Assessment Results: BCU and Basin Relative Risk Category per Projected Indicator

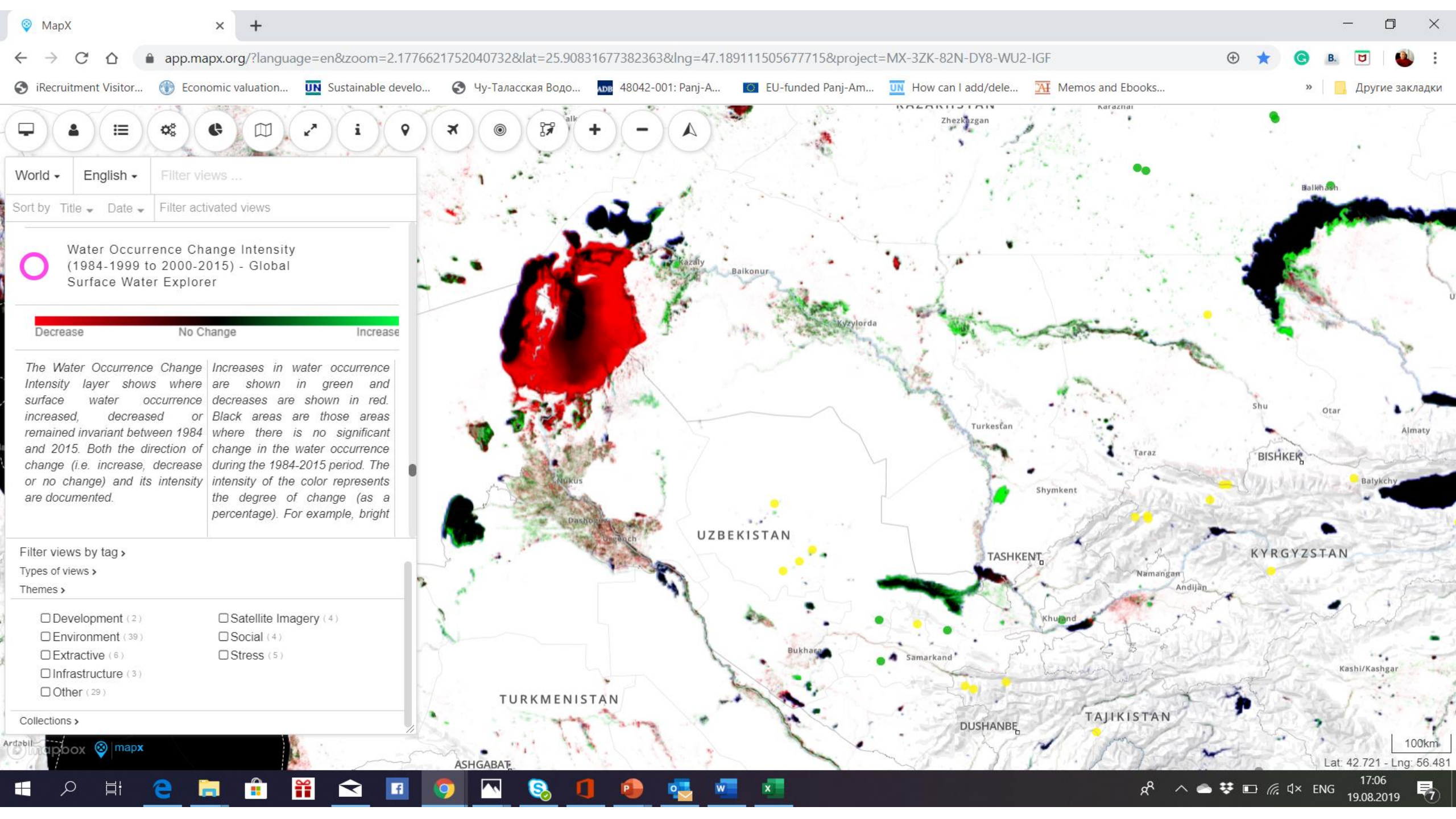
Projected Indicator	1.Environmental water stress		2.Human water stress		4.Nutrient pollution		16.Change in population density		11.Hydrological tension
	P-2030	P-2050	P-2030	P-2050	P-2030	P-2050	P-2030	P-2050	Projected
Basin BCU									
ARAL_AFG	5	5	4	5			3	5	4
ARAL_CHN							1	2	3
ARAL_CHN/IND/PAK									3
ARAL_KAZ	5	5	4	4			1	2	3
ARAL_KGZ	5	5	3	3			2	2	1
ARAL_PAK									3
ARAL_TJK	5	5	3	3			2	3	2
ARAL_TKM	5	5	5	5			2	3	2
ARAL_UZB	5	5	5	5			2	3	3
River Basin	5	5	5	5	2	2	2	3	3

TWAP RB Assessment Results: BCU and Basin Relative Risk Category per Projected Indicator

Projected Indicator	1.Environmental water stress		2.Human water stress		4.Nutrient pollution		16.Change in population density		11.Hydrological tension
	P-2030	P-2050	P-2030	P-2050	P-2030	P-2050	P-2030	P-2050	Projected
Basin BCU									
KURA_ARM	5	5	5	5			1	1	3
KURA_AZE	5	5	5	5			1	1	3
KURA_GEO	3	4	3	3			1	1	4
KURA_IRN	5	5	5	5			1	2	2
KURA_RUS									4
KURA_TUR	5	5	4	4			1	2	3
River Basin	5	5	5	5	3	4	1	1	3

TWAP RB Assessment results: Water System Linkages

Thematic group	Lake Influence Indicator	Delta Vulnerability Index
----------------	--------------------------	---------------------------







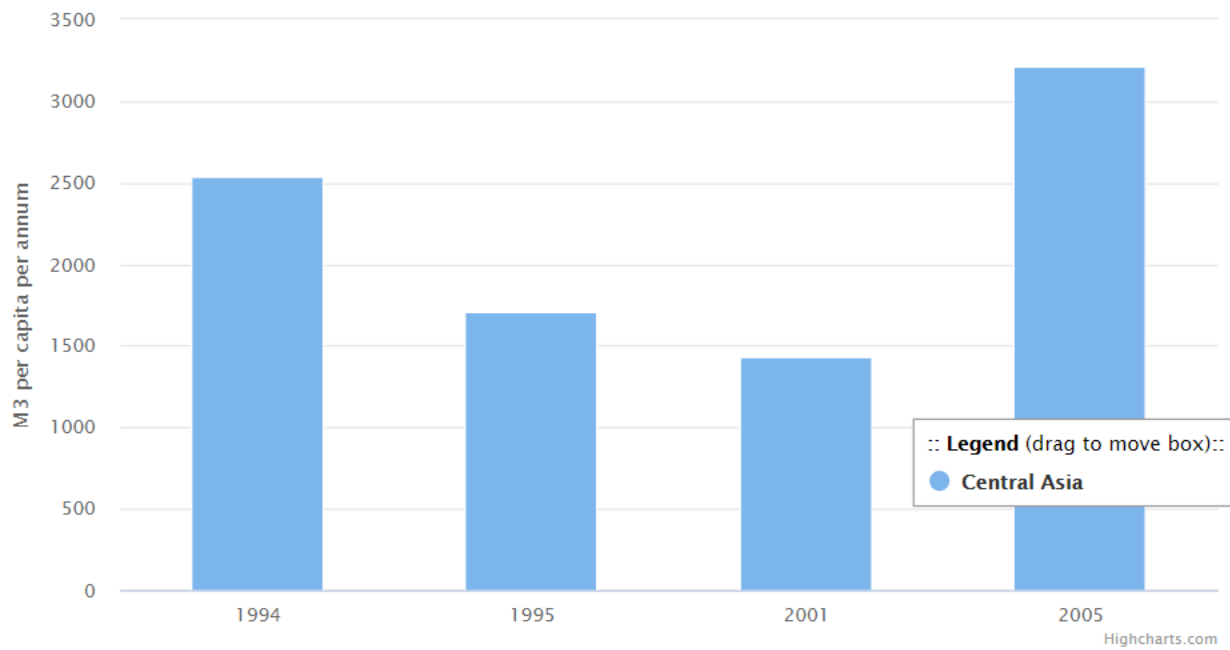


# Central Asia

Maps ▾ Data Regional Data

## Total freshwater withdrawal, per capita

Data Source: [FAO ,AQUASTAT Information System on Water and Agriculture](#)



This data series was updated from the original source on: 2005

### Definition:

The gross amount amount of water extracted, either permanently or temporarily from surface water or groundwater sources minus those produced from non-conventional water sources, such reused treated wastewater and desalinated water. This indicator is expressed in cubic meter per capita per annum.

**Aggregation:** The sum is calculated as the total of all non-missing values plus values which are extrapolated or interpolated for up to 4 years. The sum is only computed when 30% of Population size are represented by non-missing data and data estimates (either from non-missing data, extrapolation or interpolation) are available for 75% of Population size. A full description of the aggregation methods is available [here](#).

Select Country/Region/Global

### Analyze one indicator across regions

#### Select regions

#### Select countries

#### Select indicator

#### Select year(s)

from:

to: (optional)

Graph options »

#### Graph type:

☐ Area

☐ Bar

☒ Column

☐ Line

☐ Spline

Draw graph

# Online resources

Transboundary waters assessment programme (TWAP)	<a href="http://twap-rivers.org/#global-basins">http://twap-rivers.org/#global-basins</a>
MapX	<a href="https://www.mapx.org/">https://www.mapx.org/</a>
Global Surface Water Explorer	<a href="https://global-surface-water.appspot.com/">https://global-surface-water.appspot.com/</a>
Kura-Aras TDA	<a href="http://kura-aras.iwlearn.org/Updated_TDA.html">http://kura-aras.iwlearn.org/Updated_TDA.html</a>
Chu-Talas TDA	<a href="http://chui.at.kg/ru/tda">http://chui.at.kg/ru/tda</a>
UNEP LIVE	<a href="http://uneplive.unep.org/region/data/CT#charts 929">http://uneplive.unep.org/region/data/CT#charts 929</a>
Worldometers	<a href="https://www.worldometers.info/">https://www.worldometers.info/</a>



## **Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture**

### **Status**

- Current agricultural practices are based on irrigation and rather unsustainable toward natural ecosystems (Aral Sea). The challenge is in still high or increasing water withdrawal for irrigation. Degraded land and soil and increase of their area is a proof of it.

### **Outlook**

- Most of forecasts foresee water runoff cut due to the climate change effect by 2030 and beyond, which will further impact water resources, agriculture and food security in the region. High environmental and human water stresses would feature 2030 and beyond, at the extreme scale downstream countries.

### **Challenge to:**

- 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

### **Solutions**

- 2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment
- 2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round





## **Goal 3. Ensure healthy lives and promote well-being for all at all ages**

### **Status**

Quality of surface waters are poor these days and main source for that are excessive use of water in agriculture, causing poor quality return waters, poor treatment of municipal waste waters, poor sanitation and leakage of wastes to the ground sources and watersheds. West – East air masses move from the deserted planes to the mountainous upstream, extractive industries development in the catchment areas, worsening air quality in a growing urban areas increase the pressure to the human health.

### **Outlook**

Increased water scarcity will add on to the human water stress and worsened water quality in the region, specifically in Central Asia with high population growth rate.

### **Challenge to**

- 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

### **Solutions**

- 3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks
- Improve environmental monitoring, access to data and information and raise awareness



## Goal 6. Ensure availability and sustainable management of water and sanitation for all

### Status

- Excessive use of water in midstream areas of most of river basins for irrigation are the main cause of the degraded ecosystems and disappearing water bodies in downstream areas. Excessive use of water drastically worsens water quality and affects population.

### Outlook

Very high risks under environment and human water stresses by 2030 and beyond. Increased hydro policy tension in some cases to the high risk level.

### Challenge to

all targets, with higher risk to

6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

### Solutions

6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies

6.b Support and strengthen the participation of local communities in improving water and sanitation management

The set of region and country specific measures and agreements, including on cost efficiency of water use

## 7 AFFORDABLE AND CLEAN ENERGY



**Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all**

### Status

Hydropower generation by upstream countries considered as a priority in ensuring their energy security. Water as utility and water for agriculture are cross-subsidized by the Governments in order to keep lower cost of agricultural production via covering the cost of government owned water operators. Therefore, low salary rates and no interest in efficient supply and end use of waters are typical for most of the countries of the region.

### Outlook:

High pressure for all goals and their targets, requiring economic incentives/fiscal regulations for promotion circular practices in water related utilities us in industrial development as well as in consumption

### Challenges to

7.1 By 2030, ensure universal access to affordable, reliable and modern energy services

8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead

9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

### Solutions

7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support

9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States

## 8 DECENT WORK AND ECONOMIC GROWTH



**Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all**

## 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



**Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**



## 11 SUSTAINABLE CITIES AND COMMUNITIES



### Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

## 12 RESPONSIBLE CONSUMPTION AND PRODUCTION



### Goal 12. Ensure sustainable consumption and production patterns

#### Status

Economic incentives/fiscal regulations are not in the place for promoting circular practices in water related utilities us in industrial development as well as in consumption and in municipal water use

#### Outlook

High pressure for all goals and their targets, requiring economic incentives/fiscal regulations for promotion circular practices in water related utilities us in industrial development as well as in consumption

#### Challenge to

11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries

12.2 By 2030, achieve the sustainable management and efficient use of natural resources

12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

#### Solutions

11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels

12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production

12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products

12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

**13** CLIMATE ACTION



## **Goal 13. Take urgent action to combat climate change and its impacts**

**15** LIFE ON LAND



## **Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**

### **Status**

Climate change affects water resources considerably. Frequent weather change caused by changing climate already influence water resources and their use. Water ecosystems are highly affected and degraded. Transformation of landscapes and loss of habitats caused disappearance of species

### **Outlook**

High environmental water stress across the entire region. Climate change by 2030 would cause full disappearance of glaciers and it would influence considerably water quantity at the high irrigation season

### **Challenge to**

13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

13.2 Integrate climate change measures into national policies, strategies and planning

15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements

15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world

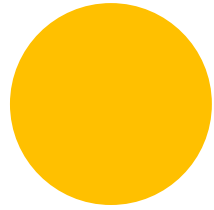
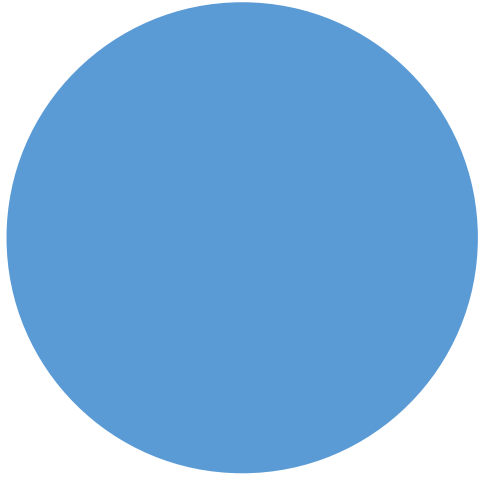
15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

### **Solutions**

13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities

15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems

15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation



Thank you for your  
kind attention!

[talaibek.makeev@gmail.com](mailto:talaibek.makeev@gmail.com)