CLIMATE CHANGE AND IMPACT ON WATER RESOURCES
CASE OF UZBEKISTAN

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CLIMATE CHANGE moved to forefront of global challenges of the XXI century, it goes beyond the limits of purely scientific discourse and poses an interdisciplinary problem that affects all key aspects of sustainable development – environmental, economic and social.
Intensive climate warming is observed throughout Uzbekistan, the average rate of warming is 0.29°C per decade.

- Increase in the duration of the dry hot period.
- Increased number of days with heavy precipitation and high variability of precipitation.
- Reducing snow cover in the mountains and degradation of glaciation.
- Increased occurrence of extreme events.
- Increasing mudflow hazards.
- Increased frequency of droughts and extreme water shortages.
CLIMATE-RELATED RISKS IN UZBEKISTAN

Industrial and social infrastructure
- Decreased wellbeing of vulnerable communities

Agricultural production
- Increased impact on local communities
- Increased losses in agricultural production

Health and wellbeing of people
- Increased risk to human health and wellbeing

Prioritization of hazards in Uzbekistan

Growing deficit of water resources and its consequences

Increased recurring droughts

Increased frequency and expansion of the area of floods and mudflows

Increased frequency of high temperatures, heavy precipitation, hails, heat waves

Growing probability of mountain lake outbursts

National
Regional
WATER RESOURCES OF UZBEKISTAN

Glaciers are located in the upper reaches of rivers, mainly in the basin of river Pskem, with an average area of one glacier 0.29 km².

More than 500 lakes are located in mountain river valleys, the largest is lake Arnasay.

Main factors impacting water resources and key water flow generation:

- Increased precipitation variability;
- Increase in air temperature;
- Glaciation degradation, reduced snow cover;
- Increased evaporation in river basins.

17777 natural watercourses, out of which
In Amu Daria basin – 9930,
In Sir Daria basin – 4926
A complex set of environmental, socio-economic and demographic problems that has emerged in the Aral Sea today have global significance due to their root-causes and level of impact.

- Increased duration of a dry, hot periods
- Water scarcity and further shortages
- Increased drought frequency
- Increased water demand by irrigated agriculture
- Intensification of all types of land degradation (salinization, erosion, salt and sand transfer from the dried-up Aral Sea bed)
- Accelerated desertification, expanding desert areas
By 2050, water resources in Amudarya basin may shrink by 10-15%; in Sirdarya basin by 2-5%.
significant increase in air temperature is expected, on average by 0.051 °C per year. Precipitation will change insignificantly, only their variability is expected to increase.
Response of water resources to climate change within the framework of REMO climate scenarios will be manifested, firstly, in a reduction in melting snow and glacial inflows to water collection, as well as in a change in the ratio of the main types of inflows per a catchment area of a mountain basin.

By 2050, runoff of rivers Pskem and Kashkadarya reduction is expected to reach 6 and 15% during the crops growing season (April - September), respectively, while melting snow inflow will decrease by about 1 and 0.6 km³ for every ten years.

The southern rivers of Uzbekistan are more sensitive to climate warming and the entire Amu Darya basin is characterized by more intensive processes of reduction of glacial and snow reserves in the mountains and runoff in general.
Extreme climate scenario based assessment shows that growing season flow for some years may decrease by 25-40%.

Software tool for forecasting water shortage and drought in Uzbekistan
87 stations carry out meteorological observations
133 posts conduct hydrological observations
63 stations and 33 posts conduct agro-meteorological observations
12 meteorological stations monitor evaporation from the water surface
6 meteorological stations monitor solar radiation
Uzhydromet radar network - 3 Doppler type radars
3 meteorological stations are included in the GOS WWW
12 weather stations are included in the ROCS
21 international exchange stations monthly compile and transmit reports to VNIIGMI-WDC Roshydromet.

Uzhydromet conducts research and assessment of climate change based on climate monitoring data.
The main objective of monitoring is to provide users with hydrometeorological, climatic, analytical and forward looking information prepared on its basis.
Climate change adaptation measures must be taken immediately. Lack of certainty should never be the cause of inaction. Practical adaptation activities and necessary research should be carried out simultaneously. Adaptation measures must be flexible. Development and implementation of adaptation measures must be based on the lessons from “own experience” and “good practice”.

Climate change adaptation options in Uzbekistan are associated with the optimization of the use and management of water resources and are aimed at mitigating water shortages.

- Introduction of an integrated water resources management system through involvement of all relevant stakeholders and establishment of links with land resources management.
- Widespread introduction of water-saving technologies in water-intensive industrial, agricultural and utilities sectors.
- Introduction of drought-resistant high-yielding crops.
- Implementation of water use monitoring systems in all sectors of the economy.
- Reconstruction of water management and irrigation systems.
- Institutional development in the field of water use and water consumption support for a number of agricultural reforms and strengthening the role of WUAs and farmers’ councils.
- Development of legal mechanisms to regulate water-land relations.
The goal of DEWS – to provide decision makers and the public with advance information on possible droughts to minimize their negative impact.
THANK YOU !