



Integrating scientific knowledge on water resources into policy dialogue on climate change

adaptation in Central Asia



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Why integrating science into policy dialogue in Central Asia?

Central Asia is one of the most vulnerable regions to climate change

Climate is warming above global average in Central Asia

Climate variations will impact the way water is formed in Central Asia

What to do?

Adaptation into Climate Change is <u>MUST</u>

But, what is going to change?

Potential change in hydrological regime in Central Asia

Quantity estimation through science is important

Integration of scientific knowledge into policy dialogue is important!



Green Central Asia

- Pamir and Tian-Shan mountains – Water Towers of Central Asia
- Water formation mainly due to snow and glacier melt
- Water mainly used for agricultural and energy production purposes
- Climate change will have negative impacts on water availability and increases DR





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July maximum air temperature at 2 m, Tashkent







Long-term water availability in Central Asia



Forecast of changes in the area of glaciers in the Naryn, Karadarya and Zeravshan river basins.

Predicted changes in the average monthly flow in the three river basins of the Naryn, Karadarya and Zerafshan rivers.









Tipping Point of Glaciers







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A TEMPORAL ANALYSIS OF GLACIAL LAKES

August 13, 1993

18 августа 2018 года









Glacier and Hazard Monitoring for the Purpose of Water Security in Central Asia



- Glaciers in Central Asia can be considered as climate change indicators
- Limited annual glacier mass balance observations in Central Asia
- Glacier mass balance data collection through expedition to Pakhtakor (UZB)
- Policy information about glacier degradation (status quo)











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Regional Water Availability Assessment (Early Drought Forecasting)







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SNOW OBSERVATION IN CENTRAL ASIA

Green Central Asia

Enhancing environment, climate and water resilience



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REMOTE SENSING BASED SNOW OBSERVATIONS



- Spatially distributed information
- Observation in remote areas
- Continuous time series
- Free of charge
- Processing requires certain expert knowledge
- Daily data update is time consuming and unsustainable task
- Data processing requires user-friendly commercial software (e.g. ArcGIS)
- Remotely sensed products are not used widely yet









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MODSNOW – operational water availability assessment model



- Uses MODIS snow cover data as an input
 - Includes cloud cover elimination algorithm (Gafurov et al., 2009)
 - Water availability prior to vegetation period based on remote sensing snow cover data





Naryn snow cover dynamics

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Current Snow Situation in Central Asia



Amudarya_Kerky snow cover dynamics





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Implementation of MODSNOW in Central Asia

Uzbekistan

- BWO Amudarya
- Uzhydromet
- Uzbekhydroenergy

Tajikistan

- Tadjikhydromet
- Institute of Water Problems Tadjikistan



Kazakhstan

- Kazhydromet
- Institute of Geography

Kyrgyzstan

- CAIAG (Bishkek)
- Kyrgyzhydromet

Turkmenistan

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Thank you for your attention!



