9th Meeting of the GEOSS Asian Water Cycle Initiative (AWCI)
International Coordination Group (ICG)

Climate Change Impact Assessment and Adaptation in Uzbekistan

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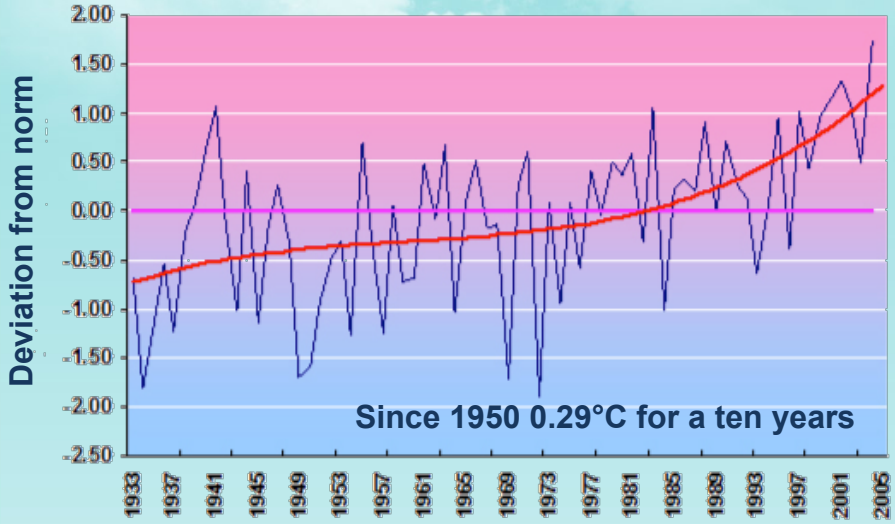
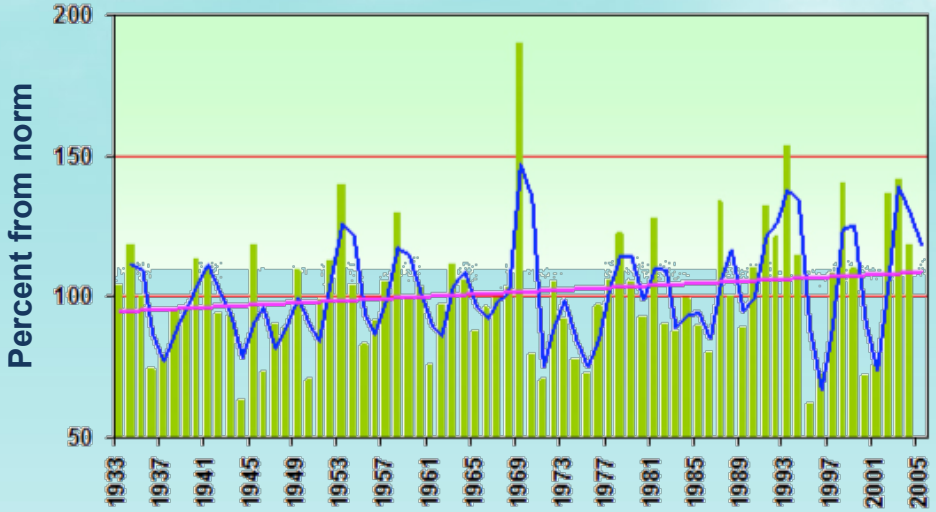
Change of climate indicators on the territory of Uzbekistan

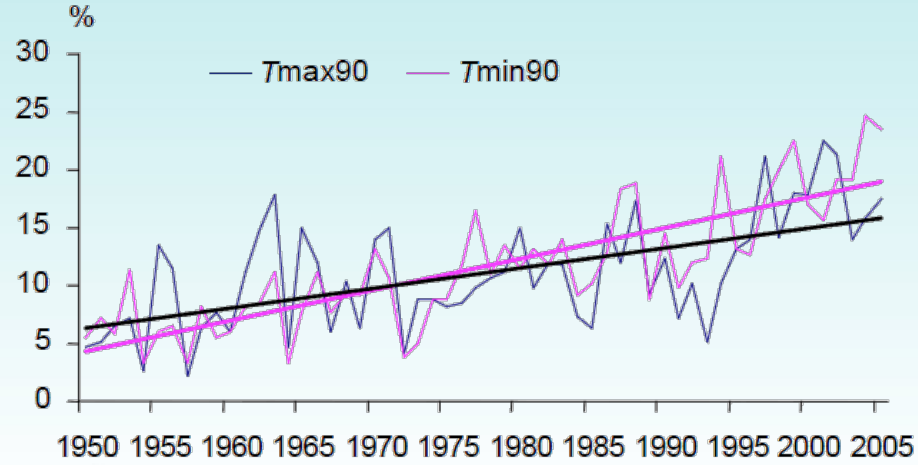
Change of mid-annual temperature across Uzbekistan



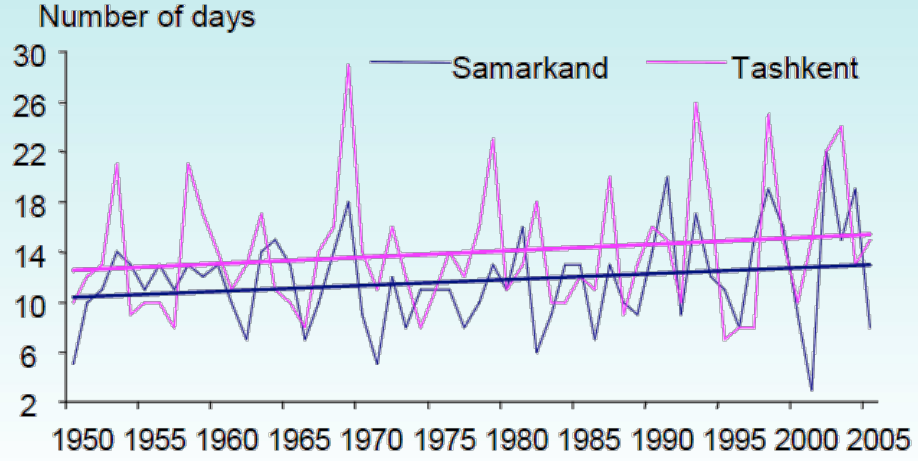
Change of the annual sums of precipitations across Uzbekistan



Change of extreme maximum and minimum temperatures (the Fergana valley)



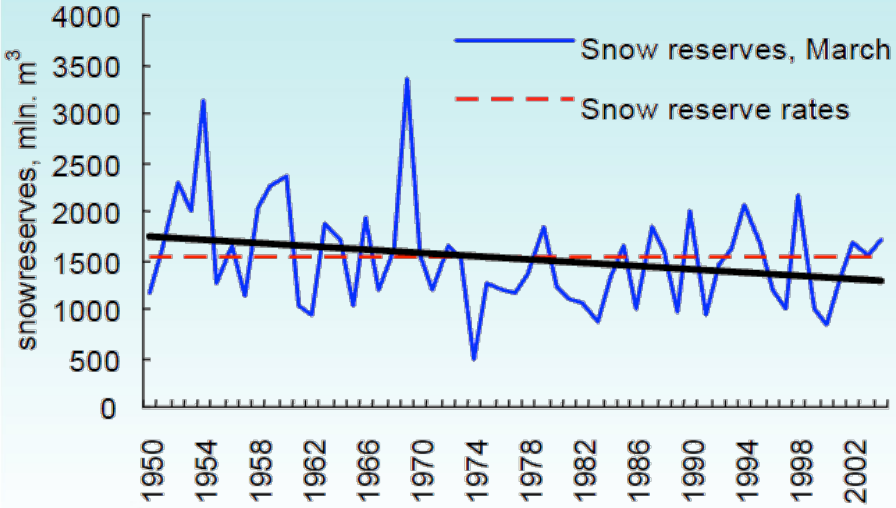
Change in the number of precipitation (>mm) days in certain foothill stations



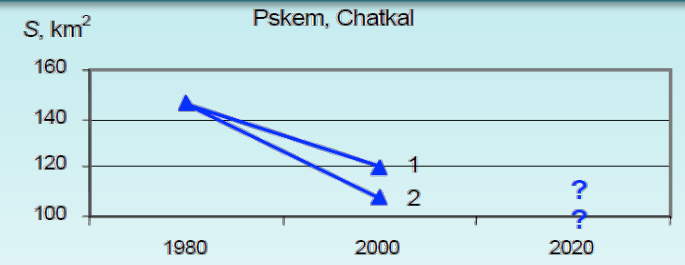
Assessment of maximum and minimum temperatures trends ($\Delta Tr/\sigma$) throughout Uzbekistan since 1938

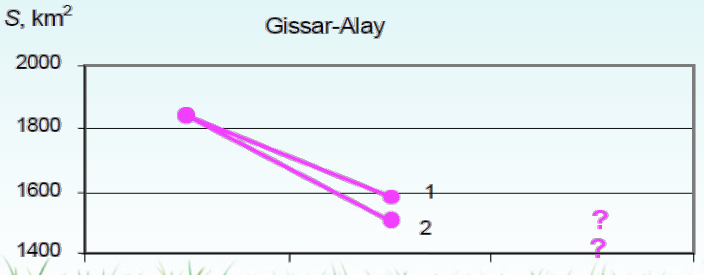
Characteristic	Seasons	Regions of Uzbekistan					
		Northern	Central	Southern	Foothills	Mountains	
						Tyan-Shan Branches	Pamir-Alay Branches
T_{min}	Winter	0.97	0.77	0.51	0.85	0.03	0.02
	Spring	1.46	1.38	1.31	1.16	0.08	0.10
	Summer	2.45	2.25	2.60	1.95	0.31	0.18
	Autumn	1.86	2.23	2.17	1.72	1.50	1.42
T_{max}	Winter	0.13	0.08	0.14	0.13	0.27	0.51
	Spring	0.53	0.41	0.35	0.34	0.29	0.23
	Summer	0.38	0.42	0.22	0.31	0.07	0.00
	Autumn	0.72	0.54	0.72	0.60	0.97	1.03

Long-term changes of the snow reserves estimated for the end March



Changes of the glacier areas (km²), calculated via various methods





Water resources in intensive utilization area: key problems and adaptation measures

Climate Change impact	Factors reducing adaptive capacity	Adaptation measures to Climate Change
Reduction of available water resources Enhancement of runoff variation in time and space Water quality deterioration Change of annual Изменение runoff re-allocation (shift of hydrograph peak to the earlier dates) Runoff reduction in vegetation period Increase of irrevocable losses in irrigation areas Water consumption increase in irrigated farming and the other water use branches (evaporation growth, increase of irrigated rates) Water consumption increase in the industry and public water supply	Inadequate monitoring of water resources in the area of their intensive utilization Low progress of agricultural reforms Limited financial and poor technical capacities Insufficient investment attraction Water use disagreement in transboundary context	***Management and monitoring*** Introduction of the system of water resource integrated management via involvement of all concerned parties and its tailoring with the land resource management *Improvement of* the system of the water recording and quality management Improvement of hydro-ecological monitoring Enhancement of the knowledge and skills of sustainable management ***Introduction of control systems*** Ensuring of the strict recording of the water resource allocation and reporting, control over their utilization in all economic sectors Maintenance of the stable level of the water supply of the country and economic sectors with consideration of transboundary nature of the key water resources ***Institutional development*** Institutional development in the field of water use and water consumption Support in implementation of the number of agricultural reforms and enhancement of the role of WUAs and FAs Improvement of the legal and institutional principles in the private farms' formation and development ***Development of legal mechanisms*** Development of comprehensive system of integrated water-land resource management including formation of organizational-legal, economic mechanisms of the water-land relation control, water and land protection and rational utilization Development of new version of Law RUz "On water and water use" with consideration of transition to the market relations and principles of water use and WUAs development Development of incentive system for the farmers, in particular, in terms of procurement and price formation policy ***Sectoral measures*** Development of the public water consumption system, water pipe-line system rehabilitation and installation of the water flow meters for all users Transition to the closed-recycling water supply system in the industry and power sector

Information needs and gaps

1. Disadvantages ground monitoring network

In Central Asia, is insufficiently developed system of ground observation network of hydrological objects that pose a threat, especially this fact is important to consider the cross-border effects of hazardous hydrological phenomena. For example, the breakthrough of glacial lakes, the occurrences of mudflow occur in one country, but the ***effect is manifested in the neighboring countries*** *and leads to significant damage. At the same time to monitor the country is not economically profitable, since the observing system expensive.*

In this regard, it needs to develop monitoring systems, having a structure of cooperation between the countries. In this regard, regional cooperation under the umbrella of international organizations is of great perspective and desperately needed.

2. Communication links between the countries

In Central Asian countries are now the communication system is based on ***telephone transmission lines****. In this case, the system alerts when a hazard is too slow relative to place hazards. There is great risk that the alert system using a telephone connection may be too late for timely action. Moreover, the very phone lines may be disrupted as a result of the impact hazard. In this regard, it is imperative to establish exchange of information through the satellite system of information exchange with the study of technical issues.*

3. High resolution satellite images with real time access

In Central Asia there are many potentially dangerous and developing objects - glacial lakes and out breaking lakes, and monitoring are difficult because of inaccessibility.

System monitoring of glacial lakes to the Central Asian countries need access to ***high resolution satellite images for early prediction*** *of the risk of a dangerous situation. Satellite imagery has the advantage that they can be used to monitor hazards* ***to neighboring countries.***

The types of activities requiring the gap filling and capacity building

✓**Analysis of the current variability of extreme hydrometeorological phenomena (probability of occurrence, duration of hazardous period by the territory) and their after-effects for vulnerability assessment.**

✓**Future risk assessment in line with the Climate Scenarios and application of the advanced methods and tools.**

✓**Development of the large-scale maps of the current and future risk for individual phenomena in line with the needs of the sectors (construction, transportation, recreation area, etc.) for identification the high risk areas.**

✓**Assessment of potential of the hazardous phenomena risk reduction via improvement of forecasting and warning.**

Thank you for your attention !