Regional G-WADI Workshop

on

Climate Change Impacts on Water Resources Management in Arid and Semi-Arid Zones

Tehran, Iran
20 – 23 June 2011

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CLIMATE CHANGE IMPACTS ON WATER RESOURCES MANAGEMENT IN KAZAKHSTAN

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The Republic of Kazakhstan is situated in Central Asia in the middle of the Eurasian continent and occupies the area ranking the ninth in the world (2.72 million sq. km). The territory of Kazakhstan can be conditionally divided into 8 hydro-economic basins: Aral-Syrdarya basin, Shy-Talas basin, Balkhash-Alakol basin, Irtysh basin, Ishim basin, Nura-Sarysu basin, Tobol-Torgai basin and Ural-Caspian basin.

Limited recoverable water resources are considered to be a specific feature of water supply in the Republic of Kazakhstan. The geographic position, continental and arid climate and topography play a specific role in the processes of formation and determine the regime of flow of surface waters in the Republic of Kazakhstan. It determines an extremely disproportionate distribution of water resources by territories, seasons and years.

On the greater part of the territory of the Republic, the main flow of the rivers occurs within a short period of high water, and during other periods the flow does not exist. There is a lack of water in the regions where there is a great demand therefore, and in the near future the demand for water in many regions of the country will increase the local resources. The complicated nature of water supply is determined by the fact that practically a half of recoverable water resources of the Republic of Kazakhstan form outside the Republic of Kazakhstan. The above proves dependence of the Republic of Kazakhstan upon the adjacent countries in respect to water resources.

The Republic possesses sufficient ground water resources, however, their distribution on the territory is extremely disproportionate, and they differ by quality and reserves.

Between 1936 and 2005, based on observation data from over 90 meteorological stations in Kazakhstan, the calculated linear trends in the mean air temperature time series and the sum atmospheric precipitation show that the climate of Kazakhstan in the period became significantly warmer. Winters in Kazakhstan are getting warmer,

on average by 0.5°C per decade, while warming less in summer, at 0.2°C per decade, implying in general an overall warming of 0.3°C per decade.

Climate change status (main conclusions): ubiquitous increase of seasonal and annual temperature; increase of climate aridity in deserts and semi-deserts areas of Kazakhstan, as well as adjacent areas; increase of total rainfall in the western and northern parts of Kazakhstan and central zone. The same trend was seen in the mountainous parts of the South and South-East of the country. However this had less impact on raising air temperatures; degradation of glaciers has been recorded by 0,8% in South-East mountains and 1% in glacier storage.

Expected climate change (main conclusions): increase of seasonal and annual temperatures; increase of precipitation in the winter period; increase of the annual amount of precipitations; decrease of rainfalls in the summer period since 2050; on the major territory of Kazakhstan increase of precipitation does not compensate increase of air temperature; all scenarios of GHG concentration change tend to increase of aridity.

The potential impact of the climate change on water resources: will increase on the average from 1-4 % to 14-22% in mountain areas; will decrease by 7-10% in the plain areas; decrease total rivers flow from 100 cu. km to 75 cu. km per year. The degradation of the mountains glaciations and its impact on the resources of the river flow primarily in the basin Balkhash-Alakol.

Activities on adaptation to climate change in the water sector of the Republic of Kazakhstan. In the National Communication (INC Kazakhstan, 2008) proposed 3 types of measures:

1. economic development with a focus on waterless and low-water technology;

2. increasing the share of groundwater use;

3. diversion of river flow within regions and beyond their borders.

To reduce the negative effects influence the vulnerability of water resources in the sector requires: reconstruction of irrigation systems and water systems to minimize water loss; replacement of moisture-loving crops on irrigated lands less moisture-loving crops; introduction of advanced technologies in irrigated agriculture; introduction of low-water technology and water recycling systems in existing industrial enterprises and utilities; the use of wastewater; review modes hydropower; dredging, the reconstruction of docks and piers on navigable rivers; replacement of the existing ship types of river transport and fishing fleet on the court with less rainfall.

Activities to optimize the health of aquatic ecosystems and the environment: strict limitation of economic activity in most shallow areas and transfer it to other areas; strict measures to establish a sanitary protection zones near surface water sources and places groundwater; mandatory environmental impact assessment of new projects on the use of water resources; widespread use of chemical and biological wastewater treatment; development and implementation of additional reclamation, agro forestry and agro-technical measures to ensure environmental safety of water resources; create a favorable water heat regime for habitat and reproduction of fish and other living organisms, regulating their numbers.

The Republic of Kazakhstan was one of the first countries, which ratified the UN Framework Convention on Climate Change in 1995 and in March 2009 the Kyoto Protocol. New joint project of the Ministry of Environmental Protection of the RK, UNDP Kazakhstan and Global Environmental Fund "Assistance to the Republic of Kazakhstan in preparation of the Third National Communication in accordance with the UN Framework Convention on Climate Change (UN FCCC)" was presented March 2011 in Astana. Kazakhstan has developed a concept for the National Programme for Adaptation to Climate Change.