7-26-2007

Development of a Rational Water Use Model in the Aral Sea Disaster Zone

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Abstracts of the presentations given on Thursday, 26 July 2007, in Session 20 of the UCOWR Conference.

Development of a rational water use model in the Aral Sea disaster zone

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A presentation will be given on a rational use of underground waters and existing water supply system by restoration and rehabilitation of the water wells. For a presentation will be used slides.

The drying of the Aral Sea has been an environmental disaster in Central Asia, particularly in Uzbekistan. Given water is the world's most pressing environmental challenge, the Central Asian environmental crisis prefigures dying lake and river disasters to come in other countries.

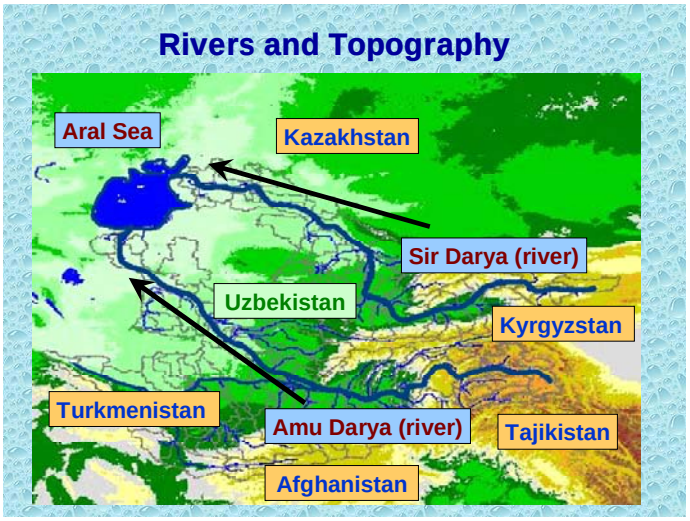

Figure 1. Rivers and topography map of Central Asia

Uzbekistan is well-known for its rich mineral and raw material resources. Stocks of gold, silver and some other rare metals are amongst the largest in the world. The country has uncovered approximately 100 different minerals concentrated in 2700 deposits. Indeed, in a number of key minerals such as gold, uranium, copper, natural gas, wolfram, calcium salts, phosphorus's and kaolin, Uzbekistan is the second country in the world as a cotton exporter. Grows 4 million tons of raw cotton per year. Given these available resources the industry is accorded a major role as a source of employment and currency earner within the national economy. So. Uzbekistan's main industry is agriculture and it needs a lot of water resources. Water sources in Uzbekistan are limited and it's a double landlocked country. The main sources are two rivers as Sirdarya and Amudarya also drainage and underground waters:

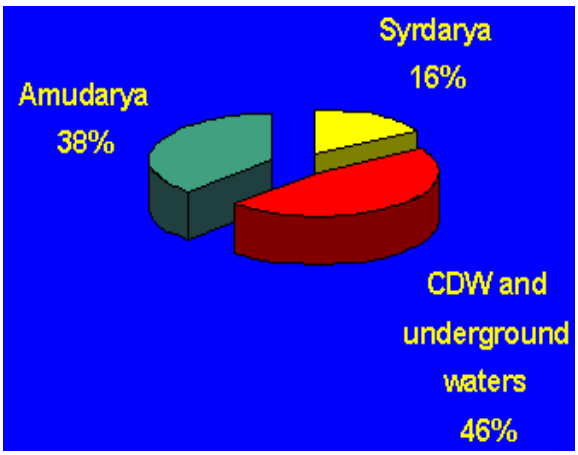

Figure 2. Water sources in Uzbekistan

General water consumption in the republic is 62-65 km3 per year, about 36 km3 per year from the main rivers of Amu Darya and Sir Darya. The rest of the water consumption is from small streams, underground sources, etc.

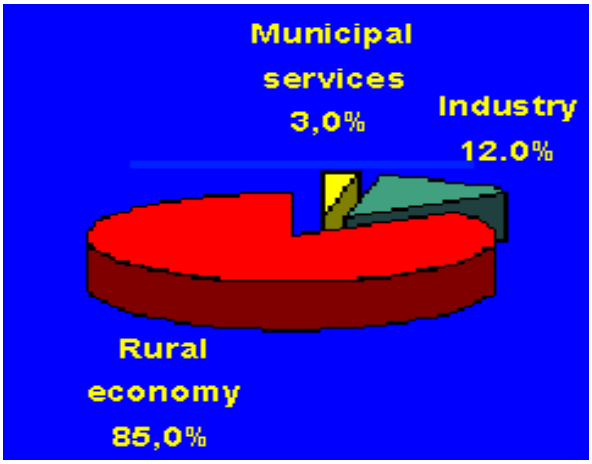

Figure 3. Water consumption in Uzbekistan and other Central Asian countries

Water, air and land pollution, critical health problems, the collapse of the fishing industry, diminution of agricultural lands, industrial bankruptcy and calamitous reverberation have effected all walks of the life in the Aral disaster zone.

The shrinking (drying up) of the Aral Sea is one of the largest ecological accidents in the history of mankind. About 35 million people living in the basin of the sea find themselves affected by the Aral crisis. Al Gore depicted the Aral Sea in his film “An inconvenient Truth”. Winds lift salt and dust into the air from the dry Aral Sea flats and carry the material hundreds of kilometers away, polluting distant watersheds, farms and settlements.

Figure 4. Aral Sea as a two lakes (picture has been taken from space)

Exacerbating the situation is misuse of remaining water resources. The research have proposed is an investigation of current water use in a small rural cities in the Aral Sea disaster zone, as a means of devising a rational water use model rural villages of Uzbekistan.

Kiziltepa with population 36.000 (located in the Navai region, Uzbekistan), that is affected by Aral Sea disaster. The land salinity is almost 95% because of water and drying of the Aral Sea.

Salinized Land in Uzbekistan		
1982	**12,000 km2**	**36% of arable land**
1985	**16,430 km2**	**43% of arable land**
Historical Water Flow to the Aral Sea was 56 km3 per year		
1966-1970		**47 km3**
1981-1985		**2 km3**
1985-2002		**less than 1 km3**

Figure 5. Water flow to the Aral Sea and land structure changing

That is way in Kiziltepa:
:

- Health problems are among the most serious in Uzbekistan;
- The water supply is not sufficient to meet the populations need;
- The area is in the arid zone, average summer temperature is around 43ºC;
- Agriculture is the main industry;
- People live in private homes in contrast to apartment complex living in urban areas.

An investigation and research results on water resources management will allow to improve the situation in the area by a rational using of local water resources.
Rational water use model in the Aral Sea disaster zone small rural village will be used for other cities or villages for improving municipal water supply system.

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