TO THE CREATION OF INFORMATION SYSTEM FOR WATER RESOURCES MANAGEMENT IN THE KAZAKHSTAN PART OF THE SYRDARYA RIVER BASIN

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The Aral-Syrdarya hydroeconomic basin represents difficult object of managing with well developed infrastructure. The main direction of agriculture – irrigation agriculture, animal industry and fish industry, which further development demands rational use of available water resources.

Irrigated massifs are located along the river from the Shardarinsky reservoir to Kazalinsk, fisheries are concentrated in the delta of the river and in Small Aral, ecologic-economic systems (lakes, haymakings) alternate with irrigated lands. Total area economic mastered lands over 350,0 thousand hectares. For today reliable information, such as placement of crops, soil conditions, etc., water distributions necessary for planning isn't present. Ecological releases are necessary for condition maintenance of ecologic-economic systems, the delta and Small Aral.

Water resources management is complicated by winter power releases which volume exceeds the water heat-sink capacities of the Shardarinsk reservoir and Koksaray control compensating. In conditions of freezing period at limited capacity of the river bed no more than 500 m^3/sec in Kyzylorda alignment and 300 m^3/sec in Aklak alignment the winter drain creates threat of dams break of bordering and flood of settlements.

Operation of similar systems in modern conditions demands application of advanced technologies of management. On many large river basins of the world are developed and water resources management models are maintained. In Kazakhstan, in particular in "The scheme of Complex use and protection of water resources of the Syrdarya river basin with inflows till 2020" (Almaty, Kazakh Hypro-Water Agriculture Institute, 2007) which was directed on advance planning of use of water resources, use of similar models which isn't provided. From there are the difficulties connected with acceptance, both operative, and perspective, administrative decisions in the conditions of variability of an arriving drain of the river to the Republic of Kazakhstan through a boundary alignment of Kokbulak. Use of water resources in the basin of the Syrdarya River without fail should consider the social and ecological intensity which is taking place in Sub-Aral area because of water resources shortage. For this purpose at ICWC meetings (Interstate coordinated water economic commission of Central Asia) on development of mutually acceptable conditions for fair water division it is necessary to have operational information about use of drain of the Syrdarya River received by Kazakhstan. Unfortunately, in existing conditions, realization of this task is extremely inconvenient. In these conditions it is necessary the reliable and timely information about water resources of the Syrdarya River and their use for effective use of limited water resources and water management of the bottom stream.

Improvement of information support of water resources management in the Kazakhstan part of the Syrdarya River basin is the extremely actual. Its realization will improve questions of water division of drain of the Syrdarya River between the states as there will be the possibility of receiving reliable information by the river basin countries about the water carelessness below the Shardarinsky reservoir and possible problems of water users that will allow to improve planning and distribution of water resources use in the bottom of watercourse.

Existence of information system will allow to make in due time decisions on management of difficult water economic system of the bottom watercourse by means of available hydraulic engineering infrastructure (the Shardarinsk reservoir, Koksaray control compensating, Kyzylorda, Aytek, Kazalinsk and Aklakhydraulic power system, Arnasaysk and Karaozek spillways, the Kokaralsk dam, damless water intakes in: a) the main channels, b) lake systems and c) natural and economic complexes).

Proceeding from it, in work questions of Information system creation for improvement of water resources management of the Syrdarya River in its bottom stream (The Kazakhstan part) with the following tasks are considered:

1. Database creation on the basis of GIS technologies on consumers of water resources with determination of parameters and indicators for calculation of requirement for water; infrastructure parameters in the tideway of the river and irrigational channels water distributions necessary for calculation; organizational arrangement of water resources management (WRM) and collection of information necessary for WRM. Information system (IS) will capture the bed of the river from Kokbulak gaiging station to Small Aral and all irrigation systems connected with the Syrdarya River in the territory of Kazakhstan.
2. Offers on monitoring improvement behind water resources and including the pilot demonstration of the automated collection of information about expenses and quality of water on separate alignments on the bed of the river, channels and behind level and quality of ground waters. The automated collection of information will be shown in two hydroconstructions on the bed of the river, on one channel within two-three irrigation systems and on 10 observant wells on Ground Water Level.
3. Visualization and operative analysis of collected information.
4. IS transfer to the operational water economic organizations and training. It will be trained in use and IS maintenance ten staff from the water economic organizations.
5. Creation of conditions for the authentic accounting of water use in the economic and ecological purposes.
6. Creation of conditions for operative decision-making on drain distribution on length of the river taking into account the lag of water and capacity of the course and hydraulic power system from 2200 m^3/sec in Shardara alignment to 390 m^3/sec in Aklak alignment in Small Aral.
7. Creation of condition on the prevention of pollution of the river and adjacent territories.