

Visit of Kazakhstan delegation to ICBA

Strengthening operational water management in Kazakhstan through improved national data availability



Date: **October 4-6, 2016**

Venue: **ICBA headquarters, Dubai, United Arab Emirates**

Background

The Water Resources Commission of Kazakhstan is responsible for the management of rural, urban and agricultural water. To this end, a large infrastructure is managed and maintained, including water reservoirs, canal systems, pipe systems, wells and a large variety of pumping stations. To manage these precious water resources, financial and human resources are used and decisions are made on a daily basis from strategic, operational and monitoring point of views.

To make well-informed decisions, knowledge on the available water resources (dam storage, river and canal flows, pumping capacity and operational times) are needed, as well as the associated cost of operation and impact a decision may have on water availability in the future. For example, release of water from a reservoir in the winter to manage flooding may decrease the available water resources in the summer for irrigation.

Day-to-day monitoring is often implemented at the operational level. However, these measurements may not always become available for the strategic decision making at the regional and national levels. Thus, human and financial resources are used inefficiently to collect the same set of information, or information is lost for the high-level decision makers. Sometimes, data collection is a goal in itself, and no objective has been set to make the data useful for operational or strategic decision making.

There are many tools that can help improving the monitoring of water resources. One of them is a geographical information system, combining spatially and temporally variable data in a system that makes it more easy, and more practical to evaluate the available information, and even combine sets of data into new analysis tools (for example, combining expected areas of irrigation with soil types and water requirement can predict the volume of water that regions will use in a specific year).

One of the strengths of a geographical information system (GIS) is that all levels of monitoring, when the system is setup correctly, can feed the data into the system, and will thus contribute to all levels of decision makers.

For the government of Kazakhstan, and the Water Resources Commission specifically, a data management and analysis tool using GIS can provide an efficient way to store information, and allow an immediate availability of the latest data to the highest level of decision making. Reservoir levels that are shared during the winter and summer will provide farmers with information on how to best manage their irrigation. This is the case in the Murray-Darling basin in Australia, or the Central San Joaquin Valley in California, where available water storage is shared throughout the season with the public, so that when the water allocation occurs, farmers already have an expectation of a high or low water allocation for their farming decisions. Decision on water availability of drinking water versus agricultural water can be made in advance when

urban census data are combined with agricultural planning data and the current seasonal water availability.

The Water Resources Commission in Kazakhstan could consider creating an automated data management and analysis system at the national level. Considerations could include the monitoring and analysis hardware needed (including automated monitoring stations, manual data collection and entry, as well as computer hardware and software for a centralized national monitoring and analysis unit), the human capacity requirements of the water resources commission to develop, manage, maintain and improve on the data management and analysis system, and the type and level of decisions that would be made based on the available data, so that the monitoring of information can be more targeted towards its goals.

Objective of the reverse linkage visit

The objective of the visit of the Kazakhstan delegation to ICBA is to discuss the opportunities of a spatial and temporal data monitoring and data management system, and the opportunities for management and policy decision making through visualization using GIS systems.

ICBA will facilitate this discussion through examples of the ICBA water management system on the research farm, examples from other projects that ICBA is involved in related to monitoring, GIS, remote sensing and policy support, a visit to the Abu Dhabi Environmental Agency responsible for monitoring and managing groundwater resources, and discussions on activities to be implemented on vertical drainage and irrigation rehabilitation in South Kazakhstan and Almaty.

Agenda

Tuesday 4 October

Arrival Airport (7:10 AM)

Drop-off at hotel

Pick-up at hotel

Arrival ICBA 13:00

13:00 – 13:30 Introductory meeting with Dr. Ismahane and Dr. Shoaib

Welcome to ICBA

Discussion of the challenges in monitoring natural resources and the opportunities that automated monitoring and GIS visualization can offer

- Water resources mapping and monitoring
- Soil mapping
- Data management through databases and data access through interfaces
- Strengths of GIS and Remote sensing and opportunities for Kazakhstan

Relationship between WRC and ICBA

- Reverse linkage (this visit) on use and implementation of water resources monitoring and GIS
- IsDB irrigation and drainage rehabilitation project in South Kazakhstan and Astana

13:30 – 14:00 Introduction Kazakhstan delegation, IDB representatives and ICBA researchers

14:00 – 14:45 Demonstration of data acquisition systems and the presentation for management decisions at ICBA.

Note: ICBA's research station is at the same location as ICBA's office. The field visit will take a short time, and will allow the delegation to understand the systems that ICBA is monitoring. The discussion and presentation of data management systems afterwards is directly linked to the visit of the research station, and intends to demonstrate how a monitoring system could be organized for Kazakhstan at a national level.

Visit to ICBA farm with special attention to (automated) sensors (Richard Soppe)

- Weather station
- SCADA
- Groundwater level measurements
- Flow meters

Office meeting on data accumulation, data management (MySQL databases) and automated reporting through web-based applications (graphs) (Richard Soppe)

14:45 – 15:00 coffee break

15:00 – 16:00 Meeting with Rachael McDonnell & team on Drought Monitoring and warning systems through remote sensing for the MENA region

16:00 – 17:00 GIS data management at ICBA (Richard Sulit) and meeting with Dr. Shabbir on soil mapping and GIS

17:00 Return to hotel

Wednesday 5 October

Note: EAD is located in Abu Dhabi, which requires travel by vehicle for 1.5 hours. The EAD is responsible for monitoring and managing the groundwater resources, and the purpose of the visit is to show a system at large scale, used to monitor water resources. Due to the travel distance, this visit takes most of the day. It is expected that discussions started on day 1 will continue during the travel to and from Abu Dhabi.

- Pickup at Hotel
- Travel to Al Ain (1 hr)
- Visit to Environmental Agency Abu Dhabi (EAD) on water resources monitoring in the UAE (confirmed)
- Return to Dubai (1 hrs)
- Continuation of discussions from Tuesday (1.5 hrs)

Thursday 6 October

Pickup at hotel

- 09:00 – 10:00 Presentation of Kazakhstan delegation on challenges in water resources management and opportunities for strengthening based on the examples and discussions of the reverse linkage program
- 10:00 – 10:30 Presentation by ICBA on the typical activities of GIS and monitoring implementation
- 10:30 – 13:00 Interactive discussion for monitoring and data management in “Rehabilitation of Irrigation and Drainage project in Kazakhstan” focusing in South Kazakhstan vertical drainage rehabilitation and in Almaty irrigation rehabilitation.
- 13:00 – 14:00 Lunch
- 14:00 – 16:00 Interactive discussion about the opportunities of the reverse linkage program, GIS and monitoring programs for Kazakhstan and the way forward

Friday 7 October

Free day, visit Dubai

Saturday 8 October

Flight Dubai – Jeddah