Groundwater Resources Assessment

Technical Workshop

GGRETA Project - Pretashkent Aquifer Case Study

Almaty, Kazakhstan, 3-4 of July 2014

Agenda

Objectives:

- **To elaborate on the GGRETA project objectives, methodology and activities;**
- **To assess the state of data collection and processing: hydrogeological, socioeconomic and environmental and legal and institutional aspects;**
- **To make agreements about further data and information collection, processing and assessment.**

DAY 1 • Thursday, 3 July 2014

Morning session: welcome addresses, the meeting objectives and the agenda

9:00 - 9:15 Welcome addresses
- Prof. Seversky, Chair of the National Committee of UNESCO-IHP in Kazakhstan
- Ms Kristine Tovmasyan, UNESCO Cluster Office in Almaty
- Mr Nurabayev (State Committee of Geology of Kazakhstan) (tbc)

9:15 - 10:00 Recap on the GGRETA project and objectives of the meeting
- Presentation: Mr N. Kukuric , IGRAC
- Discussion + Questions

10:00 - 10:30 Overview of GGRETA activities in Kazakhstan (carried out and planned)
- Presentation: Mr O. Podolny, Coordination Focal Point of GGRETA project in Kazakhstan
- Discussion + Questions

10:30 - 11:00 Coffee break

11:00 - 12:00 Introduction to GGRETA methodology, data and Indicators.

- Presentation: Mr N. Kukuric
- Discussion + Questions

12:00 - 13:00 Preliminary results in data and information collection

- Presentation: Mr O. Podolny
- Discussion + Questions

13:00 - 14:00 Lunch

Afternoon session: GGRETA-Pretashkent Methodology and data availability

14:00 - 16:00 Discussion on data availability, data collection, data gaps and actions to be taken.

- 30 min per section with a 5 min intro from national experts:
  A. Physiography and Climate, Aquifer geometry and Hydrogeological characteristics – Mr N. Baizakov and Ms V. Salybekova
  D. Environmental aspects – Ms V. Salybekova and Ms I. Skorintseva
  E. Socio-economic aspects – Ms I. Skorintseva
  F. Legal and Institutional aspects – Mr I. Petrakov

16:00 - 16:15 Coffee break

16:15 - 17:30 Plenary discussion, customising and planning (tasks, actors, timeframe)

17:30 End of the day 1

DAY 2 • Friday, 4 July 2014

Morning session: GGRETA-Pretashkent Methodology and data availability (cont'd).

9:00 - 13:00 Plenary discussion, customising and planning (tasks, actors, timeframe)- cont'd.

13:00 - 14:00 Lunch

Afternoon session: GGRETA-Pretashkent planning and activities

14:00 - 15:30 Towards groundwater assessment: Structuring and harmonising data

- Introductory presentation: Mr N. Kukuric
- Discussion about:
  - refinement of methodology, incl. indicators
  - data structuring, harmonization and
  - final products

15:30 - 16:00 Coffee break

16:00 - 16:30 Information Management System & exchange of information within the project team - Mr N. Kukuric

16:30 - 17:30 Work plan, tasks, roles and agreements –Mr O. Podolny

17:30 End of the meeting

Technical Workshop on Groundwater Resources Assessment
GGRETA Project – Pretashkent Aquifer Case Study

United Nations Educational, Scientific and Cultural Organization (UNESCO)
Almaty Office
Almaty, Kazakhstan
3-4 July 2014

Organized by
the UNESCO International Hydrological Programme (IHP), UNESCO Almaty Office and International Groundwater Resources Assessment Centre (IGRAC)

Background

The primary objective of the workshop was to present and explain to the National technical experts the methodologies designed to assess the impact of climate change and other factors on groundwater resources, as well as the presentation of indicators applied to the specific case of groundwater assessment.

The UNESCO Intergovernmental Council of the UNESCO's International Hydrological Programme (IHP), at its 20th Session held in June 2012, adopted the Resolution IC-XX-3 on the International Initiative on Transboundary Aquifer Resources Management (UNESCO IHP-ISARM Project) (attached). As follow up of this Resolution UNESCO-IHP is initiating the study of several case studies on transboundary aquifers. Case studies are aiming to assess and improve the knowledge about transboundary aquifers and define best practices and compile lessons learnt. Case studies have been identified in Central America, South Africa and Central Asia. UNESCO will provide support to national experts to enable them to carry out more in-depth studies into the selected aquifers. UNESCO-IHP will also be charged with establishing cooperation between experts in the region. Identified by UNESCO-IHP as the most interesting from both a technical and scientific point of view, the Pretashkent Aquifer is one of the case studies to be initiated.

UNESCO-IHP and UNESCO Almaty Office had therefore organised a two-day technical workshop to bring together both international experts on groundwater resources management and national water experts from Kazakhstan and Uzbekistan. During the meeting the participants discussed the GGRETA project objectives, methodology and activities, assessed the state of data availability and accessibility, agreed on further data and information collection and processing, as well as on tasks and responsibilities within the National technical expert group.

3 July, First day

Morning session: welcome addresses, the meeting objectives and the agenda

Opening Remarks

- **Mr. Neno Kukuric,** Director, UNESCO IGRAC Centre.

The meeting started with opening remarks by Mr. Kukuric introducing the workshop agenda. It was emphasized that the participants would work on Pretashkent Aquifer Case Study in the framework of the UNESCO GGRETA Project. Mr. Kukuric also mentioned that the informal working meeting was organized to eliminate all unclear questions and to identify further plan of actions.

Welcome addresses

- **Mr. Igor Seversky,** Chairman, Kazakhstan IHP National Committee, Institute of Geography, Kazakhstan.

Mr. Seversky emphasized that the workshop is the main stage of the project implementation. This was preceded by a long negotiation process at all levels, including governmental structures of Kazakhstan and Uzbekistan. In order to successfully implement the project it is necessary to establish an appropriate level expert group. It was noted that with the support of relevant ministries of both countries the national expert group responsible for the project implementation was already created. Mr. Seversky emphasized the high level of qualification of the expert group consisting of specialists with broad experience of work in various fields. He also added it is very important that UNESCO and its donors, such as the Swiss Agency for Development and Cooperation, attach great importance to this project. In fact, it is one of three projects in the world, so-called pioneer projects (note: the first in the world), and possibly on the results of the project there will be research works on wider questions. This imposes an additional responsibility on the experts. Mr. Seversky expressed his deep conviction that the expert group will cope with this task. In conclusion, he wished the participants a successful work in the workshop, and most importantly a success in the implementation of the project.

- **Ms. Kristine Tovmasyan,** Programme Specialist for Natural Sciences, UNESCO Almaty Cluster Office.

Ms. Tovmasyan welcomed the participants on behalf of UNESCO. She noted that the problem of water resources and water resources management is a priority not only for Central Asia region, but at the global scale too.

Last year UNESCO member-states ranked UNESCO's activities and emphasized the significance of water resources for UNESCO along with education, culture and other visible programmes. She mentioned that a new phase of the International Hydrological Programme (IHP), a new strategy for the next 8 years, started this year. In this strategy an important place is given to the groundwater resources. Ms. Tovmasyan emphasized that in comparison with other areas related to water resources (e.g. surface water resources), groundwater remains relatively less addressed, despite its significance.

Ms. Tovmasyan added some information about the project background. In 2012 the Intergovernmental Council of the International Hydrological Programme (IHP) stressed the importance of enhancing research in the field of groundwater. As a follow up,

UNESCO prepared a project proposal and submitted it to the Swiss Agency for Development and Cooperation (SDC). In 2013 the SDC provided a grant to UNESCO for implementation of the project in the framework of three case studies. The Pretashkent Aquifer was nominated as one of them.

Emphasizing the significance of this project, Ms. Tovmasyan expressed her expectations towards successful outcomes of the project as a good example of transboundary cooperation in groundwater resources management. In conclusion, she commended all experts involved in the project, as well as the support of the Ministry of Industry and New Technologies (MINT) and the Institute of Geography of Kazakhstan.

- **Mr. Aytmurat Issayev,** Head of Department, Committee of Geology and Subsoil use, Ministry of Industry and New Technologies (MINT), Kazakhstan.

Mr. Issayev started by thanking UNESCO for organizing the workshop and assured that, in turn, the Committee of Geology and Subsoil use is also interested in the project. The Committee will take maximum efforts for implementation of the project.

- **Mr. Nurmukhamed Baizakov,** Technical specialist in Hydrogeology, Kazakhstan.

Mr. Baizakov stated that he is very pleased that Pretashkent Aquifer was chosen as a pilot aquifer by UNESCO and he feels very proud about sharing his work of many years with the international community. Mr. Baizakov was one of the first hydrogeologists involved in the first assessment work of the Pretashkent aquifer in Soviet time. It was one of the first instances of a mutual cooperation between two soviet countries in assessment of a transboundary aquifer. Mr. Baizakov said he would cherish an opportunity of working with old Uzbek colleagues Mr. Nalich and Mr. Volkov.

The assessment of the Pretashkent aquifer is well documented with the latest reports dating the 2008-2012. Nevertheless, since 2011 Uzbekistan has pooled out of the mutual work.

Presentations and reports

Review of the GGRETA project and objectives of the meeting

- **Mr. Neno Kukuric,** Director, UNESCO IGRAC Centre.

The presentation was devoted to illustrate the framework of the project in general, including its objectives, tasks and structure. Mr. Kukuric proposed to consider and agree on terminology and definitions. It was also noted that any aquifer situated within the territory of several countries causes problems with water quality and quantity. For the reason joint management, monitoring and evaluation of water resources are needed. These activities would help to eliminate potential sources of conflicts and improve all around benefits from groundwater. Almost about 15 years ago UNESCO started a programme called ISARM (International shared aquifer resources management). UNESCO and other UN Agencies assist countries in

assessment of internationally shared aquifers. During the presentation it was also mentioned about the Global groundwater monitoring programme, Transboundary Waters Assessment Programme (TWAP), funded by GEF (Global Environmental Facility). These programmes and projects aim to bring attention to the importance and vulnerability of groundwater.
According to Mr. Kukuric, the main goal of the project is to improve the knowledge and recognition of the importance and vulnerability of the Pretashkent aquifer. The general objective of the project is to establish the dialogue across the borders and mutual cooperation.

In conclusion, Mr. Kukuric noted that the participants should agree on what information is needed and what future actions should be taken. He also added that it is necessary to harmonize the information in order to make it more understandable for general public and decision makers. It will be the second part of the project in the future.

Note: the presentation was taken with a general interest from the participants who got to see and understand the general picture of the project with references to ISARM and TWAP.

Comments and questions:

- Mr. Baizakov asked about existing examples of completed transboundary aquifer projects, including its assessment, relevant recommendations, etc.

Mr. Kukuric noted that there are some examples of transboundary aquifer projects all over the world. GEF already funded several projects in South America, Africa and Balkans and experience from those projects was taken into account.

Overview of GGRETA activities in Kazakhstan (carried out and planned)

- **Mr. Oleg Podolny,** National Coordinator of GGRETA project, Kazakhstan.

The presentation was devoted to the review of carried out and planned GGRETA related activities in Kazakhstan. For already 15 years an assessment of transboundary aquifers is conducted in the world. In Kazakhstan such kind of activity started in 2006. The work was carried out with the support of the Committee of Geology and Subsoil use of Kazakhstan. Mr. Podolny summarized work that had been done as following:
- a group of experts able to fully implement the project was created;
- the expert group had analyzed the set of indicators proposed by Mr. Kukuric. As a result, the experts were ready to discuss the indicators in order to eliminate all remained questions;
- the boundaries of the Kazakhstan part of the Aquifer were defined and this data was already submitted to the IGRAC database. Thus, two main administrative districts were defined, within which the evaluation of physical-geographical and socio-economic indicators will be conducted.

During the presentation a general map of the Pretashkent aquifer was presented with indication of the recharge zone and the main direction of groundwater.

Mr. Podolny emphasized the significance of the support provided by the Committee of Geology and Subsoil use and expressed his gratitude for the assistance in the project implementation.

Introduction to GGRETA methodology, data and Indicators

- **Mr. Neno Kukuric,** Director, UNESCO IGRAC Centre.

The presentation focused on the assessment method and approach of all the aquifers of GGRETA project. At the beginning of the presentation Mr. Kukuric noted the methodology that would be presented was developed for the whole world and it doesn't take into account specifics of particular aquifers. Thus, the experts should take into account specifics of Pretashkent aquifer.

There should be multidisciplinary assessment, which means that, besides hydrogeology aspects, it is necessary to take into account socio-economic, environmental, legal and institutional aspects of Pretashkent aquifer. The assessment will be based mostly on existing data. It was also specified that countries need to share information and data in order to make the assessment. The countries should focus on particularly transboundary issues to define actions which need to be taken.

Comments and questions:

- Mr. Podolny asked about the **Indicator 1.6** related to the aquifer vulnerability to pollution. The question concerned about the gradation of the indicator, how this parameter can be divided on levels, degrees, etc. (e.g. "vulnerable", "non-vulnerable", "moderately vulnerable").

Mr. Kukuric said that no relevant explanation of the question is provided in the methodology. He proposed to use the methodology of US Geological Survey (USGS) for this parameter.

- Mr. Podolny explained that the question was arisen because there is an **Indicator** 3.2 of groundwater pollution. But Pretashkent aquifer is confined; therefore, it is non-vulnerable to pollution. It was asked what the reason of collecting this information, if this type of data doesn't actually exist. There is a vulnerability to pollution but it is extremely low because the Aquifer is confined.

Mr. Kukuric noted that even if the aquifer is confined, it still can be polluted. This indicator is needed to show the degree of the aquifer protection from the pollution. Thus, the Indicator 1.6 will give an opportunity to compare Pretashkent aquifer with other aquifers. Some explanations of the indicators are given in the Methodology (p.42), including the indicator of aquifer's vulnerability. It was suggested to collect the relevant data and then, on that basis, it would be decided how to define this indicator.

- Mr. Mavlyanov, an expert from Uzbekistan, asked a question on the population density. He said that the indicator of the population density is primarily related to use of groundwater resources for drinking and industrial purposes. But in Uzbekistan

groundwater is not used for drinking purposes. It's used for recreational purposes or for bottling (for commercial purposes). So, in case of Uzbekistan, this indicator is not correlated with the population density. It was noted that for Uzbekistan it is quite expensive to use this groundwater for drinking purposes.

- Ms. Skorintseva added that, in case of Kazakhstan, Pretashkent groundwater is defined as a source of drinking water (it is used for domestic water supply). Thus, here the experts face with the differences in two countries, in terms of purposes of groundwater use.

Mr. Kukuric mentioned that these purposes of groundwater use are not specified in this population density indicator but it will be covered in the other indicators (Indicator of Human dependency on groundwater).

- Mr. Mavlyanov explained the question on the population density indicator: in Kazakhstan there is an opportunity to calculate this indicator with regard to the population density. But in Uzbekistan it is impossible to calculate this indicator because the amount of groundwater resources couldn't be divided to the population rate, as it is not used by the population only for drinking purposes. This indicator could be calculated only with regard to the amount of bottles or patients who use this water in recreational centres.

Mr. Igor Seversky suggested not to focus on this question. He noted that the experts would definitely face with such kind of differences in data availability, types of water use, etc. He proposed not to concentrate the attention on these details and to start working, while in the process something of these details could be agreed and adjusted by both sides.

- Ms. Skorintseva asked a question about water abstraction. According to the statistics data on the Republic of Kazakhstan, during last 10 years such kind of research is not conducted. Last data on water abstraction in Kazakhstan refers to 1996.

It was noted by other experts from Kazakhstan that this data actually exist but it is not available for general public, while Mr. Kukuric emphasized that experts need to collect only available data.

After the discussion Mr. Podolny thanked Mr. Kukuric for the detailed explanation of the methodology and developed indicators. The methodology was received very well with a lot of interest. All of the participants noted that the indicator matrix started to make sense to them and became more understandable.

Afternoon session: GGRETA-Pretashkent Methodology and data availability

Round table and Discussion

A 2-3 hour long open round table discussion and explanations regarding the relevance took place afterwards. During the round table discussions every single aspect of methodology was read by the group of experts in Russian and discussed amongst themselves with request for clarifications when the meaning was unclear.

Ms. Skorintseva started with the physiography and climate data. She brought attention of the participants to the availability of data on temperature and climate. It was told that obtaining this type of data is quiet complicated and very expensive. This type of data costs money.

Ms. Basova added that HydroMet sells the new data for a high price. Cost of one figure of temperature data set up by the Hydromet was 3000 KZT or about 17 USD.

Ms. Skorintseva asked for what period of time the experts need to create a row of average temperatures (for 10 years, for 5 years, etc.)

It was decided by all participants that it is reasonable to make this temperatures row in accordance with data availability.

Ms. Skorintseva also noted that some type of data doesn't actually exist, e.g. data on evapo-transpiration (Indicator A.3). It was noted that no research is conducted in this field since 1987, it is not measured anymore and there is no relevant data in Kazakhstan.

Mr. Baizakov suggested to take data for the last 20 years, as, according to him, the data hadn't changed much.

To the question posed by **Mr. Kukuric** related to the availability of data on the level of water and the latest piezometric data measurements **Mr. Bayzakov** answered that no measurements had been taken for 4-5 years. He suggested that piezometric measurements from some representative boreholes (40 in total) ought to be taken to update the database, given the fact that most of the wells are private property. He promised to forward UNESCO the costs of the field works.

Legends and Harmonization

The participants also discussed what types of programs they use. **Ms. Skorintseva** informed that in Kazakhstan ArcGis is used, while **Mr. Mavlyanov** added that in Uzbekistan both ArcGis and Mapinfo are used. **Mr. Kukuric** mentioned that as soon as the format is compatible it should not be of a great importance for IGRAC.

Experts from two countries have agreed on legends, geology, scales and general approaches in the aquifer assessment in order to facilitate future harmonization of the information and data. Giving a reference to the process of necessary data collecting,

it was noted by the participants that not all thematic maps, graphics or data are available. For example, experts from Kazakhstan informed about the absence of irrigation data (**Ms. Salybekova**) or data on the capacity of the aquifer (**Mr. Podolny**).

Mr. Issayev and **Mr. Mavlyanov** made remarks regarding the official position of the governments and current practices in both countries. Thus, most of the water related services in Kazakhstan have been privatized and supplied by independent companies. In Uzbekistan the checks, monitoring, and other services are undertaken by state expeditions; these activities are well documented and undertaken regularly.

4 July, Second day

Sessions

Presentations and reports

Towards groundwater assessment: Structuring and harmonizing data

- **Mr. Neno Kukuric,** Director, UNESCO IGRAC Centre.

During the presentation Mr. Kukuric introduced a draft preliminary work plan of the project to the experts. It was noted that some information and data on Pretashkent Aquifer had been already collected both from Kazakhstan and Uzbekistan parts. Next step for the project implementation is combining and harmonizing collected data. Mr. Kukuric said that there is an experience of such kind of harmonizing data between Germany and the Netherlands. That process took about two years. Since different countries use different names and terminology, there is a reasonable suggestion to standardize it on both sides. In other words, there is a necessity to put all collected data together and harmonize it, putting in one format with common technology and language. The harmonization is about developing the common language and terminology in classification, in map scale, in table formats and etc. It is important to make the information understandable and available for decision-makers.

Information Management System and exchange of information within the project team.

- **Mr. Neno Kukuric,** Director, UNESCO IGRAC Centre.

The presentation was devoted to the Information Management System (IMS) and data processing. The system will consist of processed data and documents that support groundwater management. Mr. Kukuric explained what would be the purpose and differences of the IMS and how it can be used for analytical and managerial purposes. There are future plans related to the access to information. It is proposed that people would have an access to data base. Mr. Kukuric expressed his expectation about the development of a trial version of IMS by the last quarter of 2014.

- **Ms. Valentina Salybekova,** Hydrologist-ecologist, Kazakh National Technical University, Kazakhstan.

The presentation was devoted to hydrogeological and environmental indicators needed for the multidisciplinary assessment of the groundwater resources, concerning data availability. It was noted that not all types of data are available (e.g. there is no data on irrigation).

- **Ms. Irina Skorintseva,** Head of the Laboratory of landscape and nature management issues, Institute of Geography, Kazakhstan.

The presentation was devoted to data availability and indicators readjusted after the explanation of methodology, in terms of socio-economic and environmental aspects. Ms. Skorintseva paid special attention to unofficial landfills, animal waste and animal burial sites and presented the description of the agrarian lands in Pretahskent area.

Discussion

Ms. Skorintseva and **Mr. Issayev** noted the usefulness of the IMS and thematic maps. It's been noted that Institute of Geography of Kazakhstan has done a lot of work in aliasing the water resources of Kazakhstan.
Mr. Mavlyanov noticed that the methodology, which was introduced during the workshop, is universal. It can be applied to evaluate other aquifers, adding some appropriate elements. Mr. Mavlyanov emphasized that, since Uzbekistan relates to the same aquifer, the information from both sides needs to be combined. He noticed that the presented methodology on the assessment of Pretashkent area could be used as a National program for the complex assessment of groundwater resources of Uzbekistan.

Mr. Baizakov, **Mr. Podolny** and **Mr. Issayev** mentioned that another aquifer located above the Pretahskent aquifer couldn't be analysed, as there is no relevant data available. It has been suggested that since those two aquifers marge closer to the surface, it's would be worth examining both separately and as a part of the same complex. Apparently, there are a lot of drilling works planned for the middle lying aquifer. Mr. Issayev promised to supply the data from drilling upon receipt, probably within next 1-2 years (2014-2015). He will submit the drilling data upon receipt to the national experts. It's been suggested that the levels lying above the Pretashkent aquifer (that might be considered as more important areas for the economy of the country) could be added to the analyses later.

The experts from Kazakhstan suggested that the technical assessment would be conducted only in relation to the lower transboundary aquifer at this point of time. Uzbekistan was in favour of studying all the aquifers appearing in the cross-section regardless of their transboundary nature.

Both countries agrees to present a narrative description of the surface waters and deposits located above the transboundary Pretashkent aquifer to give a more holistic picture and touch upon the ecosystems and other issues of value for the assessment.

Mr. Baizakov mentioned the existence of temporary underground methane storage, located close to the border of Uzbekistan. He believes that methane pumping could potentially contaminate the waters of Pretashkent aquifer. **Mr. Issayev** promised to consider an official enquiry into the matter.

Conclusions and recommendations

Summing up, **Mr. Kukuric** said that all the participants had made a great job: the project, the methodology and related activities were explained. The data availability was identified. Details like scales, units, parameters were also discussed.

Participants of the meeting agreed on the following conclusions:

- Participants greeted the organization of the workshop as a very useful step towards implementation of the project. Most of the participants expressed their content at an opportunity to work on the methodology face to face with UNESCO / IGRAC experts.

- The task of data collection and responsibility for the GGRETA project have been confirmed:
  - ✓ Ms. Skorintseva – socio-economic and environmental aspects;
  - ✓ Mr. Baizakov – hydrogeological aspects;
  - ✓ Mr. Petrakov – legal aspects;
  - ✓ Ms. Salybekova – hydrogeology and environmental aspects.

- A technical review meeting should be organized (the meeting will take place at the beginning of November in order to provide experts with time needed to collect and process data).

- The information has to be collected, processed and digitized.

- It's been agreed to conduct field works related to well survey: to measure water level and study the area of the gas storing facility.

- Mr. Baizakov suggested to organize a presentation of the project for the regional authorities and general public of the communities located in the Pretashkent area, motivating his suggestion with the fact that particularly those communities are the main users of the water. Informing and demonstrating the project to those people would provide a better water resources management and ultimately policy making. Mr. Issayev and Mr. Mavlyanov welcomed the initiative. It's been suggested to try to make such a presentation during following missions to the region.

The participants of the workshop emphasized the importance of the meeting and its contribution to elimination of all unclear questions. They also expressed their beliefs in the successful realization of the project.