Session DP RE 5.4: Fresh water storage in brackish groundwater: how can we make it work?

Date and Time of Session: Friday, 1 October 2010, 9.00 – 10.30

Short description of the session topic and the objective of the session

Topic: In coastal areas the groundwater in the shallow aquifers is often brackish and the availability of fresh water in dry periods mainly depends on available surface water storage. Impacts of climate change in coastal areas are expected to aggravate the situation and will put a heavy burden to water managers to secure fresh water availability. This counts in particular for rural areas which often depend on local and low cost solutions (like in Bangladesh) and where land scarcity restricts the construction of large surface water storage reservoirs (like in the Netherlands). A challenging alternative is the infiltration and storage of fresh water (rainwater, river water) in shallow brackish aquifers. While infiltration techniques and storage technologies are widely available, the infiltration in brackish aquifers faces some specific challenges, especially with respect to water quality issues. In developing countries, the infiltration technology should also be low cost and robust.

Objective: Provide an overview of the state of knowledge and main issues and challenges and present the results of ongoing action research in Bangladesh and the Netherlands.

Session Agenda and Main Speakers

Session chair: dr. Koos Groen - Acacia Water / VU University Amsterdam – The Netherlands.

Main speakers:

- Quality aspects of storing fresh water in brackish aquifers; experiences from Netherlands and Florida - Prof. dr. Pieter Stuyfzand – KWR Water cycle Research Institute / VU University Amsterdam - The Netherlands.
- 3D groundwater model: a tool to design schemes for infiltration and storage of fresh water in brackish aquifers - Jouke Velstra - Acacia Water – The Netherlands.
- Fresh Water Storage in Brackish Aquifers of Bangladesh Coastal Zone – Prof. dr. Kazi Matin Ahmed, Geology Department, Dhaka University – Bangladesh.

Most exciting insight, moment or outcome

The technique of storing fresh water in brackish groundwater is already in use. At this moment, the technique is tested in Bangladesh and if successful, it will be applied in the many more regions of the country. This proves that it is a low cost alternative for surface water storage, which also takes up much space, which isn't available in countries like Bangladesh.

Main conclusions, themes, insights or messages

Although it's in a initial stage in many countries, storing fresh water in brackish groundwater is a proven technique. It is being applied in different countries with success. There are however some points of attention that must be dealt with to make storage successful. The experts agree that for new projects, it is wise to start with a small well and test it for a while. When the well seems to operate without any problems, the well can be expanded to a larger scale.

Key phrases or quotes

- It's necessary to be well Informed about the characteristics of the area and the dimensions of the storage.
- Site selection is important. Not all area's are suited for fresh water storage.
- Use models to test the feasibility for designs and circumstances. Only 3D-models will provide reliable outcomes. Although a model is as good as the available data and knowledge.
- Fresh water is lighter than salt water, so fresh water floats on salt water. This may cause water bubbles to drift away which is important when pumping out the fresh water.
- By selecting appropriate water sources or by pretreating of the freshwater that will be stored, clogging of the well can be prevented.
- Quality of the intake water must be well managed to ensure the operation of the well.
- Good well management is important to make sure the well can be kept operational in the future.