Session DD 2.3: Salinisation in South-West Netherlands

Chair	Prof.dr. Eelco van Beek, Deltares/Technical University Twente, the Netherlands
Keynote speaker	Prof.dr. Sybe Schaap, Delft University of Technology, the Netherlands
Speakers	Ies de Vries, Deltares, the Netherlands
	Steven Visser, Province of Zuid-Holland, the Netherlands
	Gualbert Oude Essink, Deltares, the Netherlands
	Stephanie Janssen, Deltares, the Netherlands,
	Perry de Louw, Deltares, the Netherlands
	Sara Eeman, Wageningen University, the Netherlands
Rapporteur	MSc. Jeroen Veraart ,Climate changes Spatial Planning, the Netherlands

Currently Sybe Schaap is professor at Deflt University of Technology, but before he was president of Water Board Groot Salland. He presented some examples of fresh water availability issues of his former job. The strategy from the past: pump water away when there is too much water, and pump in a reverse way in case of drought. In 1998 there was heavy rainfall: the system could not handle the excess amount of water, which resulted in inundations. Old landscapes were less damaged compared to recently created agricultural land. This was due to the fact that in the older landscapes heights gradients were created in the past. The inundations resulted in a new water act in 1998. The objective of this new act was to store the water (in the soil) as long as possible. Is this Water Act EU proof and/or climate proof? Sybe Schaap showed some pictures of the city Kampen that illustrate the impacts of 1:10, 1:25 and 1:100 year flood risks. The water board decided to change the ditch profiles to increase storage. The new profiles are beneficial to agriculture in periods of drought. The new ditches were ecological friendly designed and should also result in improved biodiversity values. In order to construct the new ditches agricultural land was used, the entrepreneurs were compensated by paying 50.000 Euro an acre. The project thought us that there is need for a better institutional structure and leadership to implement climate change adaptation measures.

Steven Visser: The Provinces South-Holland and Noord-Brabant benefit from fresh water reservoirs in the southwest delta. Before 1970 only producing grain was possible but now also fruit, flower bulbs and so on. We became more depended for fresh water. The South-West Delta is influenced by the sea. We have to consider external and internal salinisation: an increase of natural background chloride levels. Fresh water inflow from the rivers should prevent external salt water intrusion (via the sea) at the local fresh water inlet points (for example Bernisse and Gouda). Lake Volkerak-Zoom has a problem with blue algae. The best way to combat the blue algae is salinisation combined with the return of tidal movement. This is the view of the national policy makers. However, a new salt lake in the area has a major impact on fresh water intake. Extensive consultation with stakeholders and (co)-decision makers was done in 2008/2009. The result was a report (June 2009), which includes 18 measures to maintain fresh water dependent functions in the areas around the lake. These measures ensure fresh water availability in the region for the coming decades. In the long run more measures are necessary but we have some time to think about it.

Are the presented measures climate proof was the question of Ies de Vries. Schouwen-Duivenland represents the old situation. The areas of the Volkerak-Zoommeer are fed with water from elsewhere (Rhine water), up to 100%. Currently we have no water shortage, the regions have a high service level at low costs. But what about the future? In this study we did a scenario analysis for the years 2003, 2015 and 2050. Major conclusion: flushing the system with fresh water is very inefficient: only 3% is used for sprinkling. Climate change is not the problem for water managers but the inefficiency of the system. The 'Resisting strategy' and 'living with salt water' strategy can both be made climate proof. The resisting strategy will require big investments in infrastructure and the water supply remains a public service. The 'living with water' strategy may lead to a private market for fresh water. In the latter one we have two sub-choices: (1) more salt tolerant crops and (2) implement water technology.
Discussed topics include: Is groundwater use, use of fresh water lenses and rainwater use also part of these strategies? The presentations seem to follow the vision that all types of land use should be possible at all places in the Netherlands. In the other Deltas (example Mekong) they cope with the natural circumstances.

Guy Oude Essink, (http://flood.firetree.net), states the past determines the future, looking from a ground water point a view. Salt water from the sea takes 1000 years before internal salinisation occurs. The groundwater system is complex, but nowadays we can do 3D numerical modeling. The zone of influence (of seal elvel rise, SLR) for internal salt water intrusion is limited). The future boundary conditions are SLR, groundwater recharge and land subsidence. Past reclamation of polders will determine the future characteristics of salinisation. We would like to assess the (un)feasibility of regional measures to stop salinisation. Local solutions are easier to embed than regional measures.

Stephanie Janssen presents a case study of fresh water resources in Zuid-Beveland/Zuid-Brabant (both impacted by a decision to make lake VZM salt). The field trip is essential for social learning. It is important to take time to get commitment. You should be aware of the role of the process and the role of the participants. The regional solutions were taken up in the advisory report (June 2009). Ies de Vries: we were successful to legitimate the salinisation of VZM towards farmers. The current problems are not with the farmers but with the regional policy and the drinking water sector.

What is the impact of salinisation on surface water and the water in the rootzone, asked Perry de Louw in his presentation. The study delivered chlorinity profiles (e.g. soil depths) for different areas, also profiles with time steps. The study included EM measurements to map the fresh-saline interface with helicopter jointly with Germany. Model analysis included the use of KNMI scenario's (W+). Also calculations about the thickness of the rain water lenses under climate change was done. Rain water lenses are very vulnerable to climate change.

Presentation Sarah Eeman
First a steady state model exercise was made to assess the dynamics in fresh water lenses. But the system is not dynamic (second part of the research). That is why a SWAP analysis was done in addition. Crop damage in this study is defined as a decrease in plant transpiration compared to potential transpiration. No irrigation was done in the simulation (e.g. comparable with Schouwen-Duiveland). Analysis was done for a dry and wet year, the results were compared with a case study in the North of Italy. Sensitivity to oxygen and salinity stress seems to increase strongly when the climate gets warmer. Solutions for disappearing rain water lenses are part of new research within the Knowledge for Climate programme.