

# Sharing precious water volumes in The Water Farm: from concept towards practice

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## ABSTRACT

On the Walcheren peninsula in the Netherlands, the majority of the groundwater and surface water is saline. As a consequence, the area suffers from drought and salt damage to agricultural crops. Farmers are used to accept these damages because no solution seemed available. In addition, climate change scenarios predict decrease of the available fresh water. Though investments for climate change are not common business for farmers, solutions need to be invented today for a climate robust fresh water supply. To explore potential solutions, the concept of the Water Farm was founded in 2007. The Water Farm is a cooperation of farmers, landowners, water board, etc. to manage (e.g., receive, store, use, process, deliver) fresh water in the region in such a way that no water from elsewhere needs to be invoked. It has been applied in practice in 2010, in a 3 km<sup>2</sup> area on Walcheren. Applied research is combined with the practical knowledge of farmers and the policies and regulations of the government. We introduced a framework of interaction between (geo)hydrological knowledge and process for participation. The technological input was the start of the process. Researchers presented their knowledge of the watersystem and possible measures to improve the fresh water supply. By participation of the farmers in the technological input (measurements, input numerical models by local knowledge), the technological insights increased and farmers found out that acceptance of salt and drought damage is not necessary. Tools in this framework are participative monitoring of (ground)water, workshops with maps, field excursions and participative decision making. We used various groundwater monitoring techniques and variable density groundwater models to design measures and to explain and understand the system. So far, the following improvements in the water system have been achieved: 1) isolation of saline seepage by simple dams, 2) storage of groundwater in the subsoil by controlled drainage, 3) installation and testing of an innovative artificial recharge system to increase a fresh water lens, 4) change in the water management (store instead of flush away fresh water) and 5) 'green deal' with the national government and consideration of change of regulations for managed aquifer recharge and recovery. We believe that the concept of the Water Farm could be used in all kinds of water problems worldwide and will help to bring (applied) scientific results into practice.

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