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Discipline: Hydraulic Engineering

Title: Re-use of treated wastewater for irrigation and groundwater recharge: effects on quantity and quality of groundwater

Abstract: Water is an essential resource for households, industry and agriculture. However, the pressure on (drinking) water supply for households, industry and agriculture, water quality and aquatic environments is increasing. Climate change is projected to increase evaporation, intense precipitation and the intensity and frequency of droughts which can result water shortages for households, industry, ecology and agriculture. Therefore, in order to evolve towards a sustainable robust water system, water re-use and reclamation of treated wastewater are essential. By re-using treated wastewater as a source for water for agriculture, industry, ecology or households, the water cycle can be closed to create a circular water economy and create more water security for agriculture and industry. An important barrier hampering application of re-use of treated wastewater for irrigation and/or groundwater research at this moment is the lack of knowledge about its environmental impacts on groundwater quantity and quality. In many settings it is still unclear how the groundwater table would react to infiltration or injection of treated wastewater in the subsurface and whether it would be possible to store treated wastewater in aquifers. Moreover, irrigation of crops or artificial groundwater recharge using wastewater could affect groundwater quality. Therefore, the aim of this project is to determine the effect of re-use of treated wastewater for irrigation and/or groundwater recharge on groundwater levels and groundwater quality. This will be done combining field measurements, lab measurements and groundwater flow and transport modelling.

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