



## **Identification of the influencing factors on groundwater drought in Bangladesh**

Syed Md. Touhidul Mustafa and Marijke Huysmans

Department of Hydrology and Hydraulic Engineering, Vrije Universiteit Brussel (VUB), Pleinlaan 2, 1050 Brussels, Belgium  
(smustafa@vub.ac.be)

Groundwater drought is a specific type of drought that concerns groundwater bodies. It may have a significant adverse effect on the socio-economic, agricultural, and environmental conditions. Investigating the effect of response different climatic and manmade factors on groundwater drought provides essential information for sustainable planning and management of water resources. The aim of this study is to identify the influencing factors on groundwater drought in a drought prone region in Bangladesh to understand the forcing mechanisms. The Standardised Precipitation Index (SPI) and Reconnaissance Drought Index (RDI) have been used to quantify the aggregated deficit between precipitation and the evaporative demand of the atmosphere. The influence of land use patterns on the groundwater drought has been identified by calculating spatially distributed groundwater recharge as a function of land use. The result shows that drought intensity is more severe during the dry season (November to April) compared to the rainy season (May to October). The evapotranspiration and rainfall deficit has a significant effect on meteorological drought which has a direct relation with groundwater drought. Urbanization results in a decrease of groundwater recharge which increases groundwater drought severity. Overexploitation of groundwater for irrigation and recurrent meteorological droughts are the main causes of groundwater drought in the study area. Efficient irrigation management is essential to reduce the growing pressure on groundwater resources and ensure sustainable water management. More detailed studies on climate change and land use change effects on groundwater drought are recommended.

Keywords: Groundwater drought, SPI & RDI, Spatially distributed groundwater recharge, Irrigation, Bangladesh