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RESEARCH ON THE IMPACT OF SOLAR PARKS ON THE SOIL WATER BALANCE

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With the envisaged increase in the use of renewable energy it can be assumed that the number of solar parks will continue to rise. While efforts concentrate on energy production, little is known on the impact of large installations on the soil water balance. There, the spatial distribution of rainfall and evapotranspiration changes. While infiltration occurs predominantly under the edges of the panels, areas under the panels and shaded areas are characterised by reduced evapotranspiration. First investigations in France indicate reduced losses through evapotranspiration which especially during dry periods can lead to improved water availability and plant growth. Areas with little plant cover could be characterised by increased infiltration and ground water recharge. As such the impact of solar parks depends on the specific climate and site conditions and could be positive such as during dry periods or indeed negative if groundwater levels rise as consequence of increased recharge. Measuring, analysing and modelling such impact is the topic of a project led by the University of Applied Sciences Dresden (HTWD). To quantify the changes in rainfall pattern, soil moisture measurements have been carried out at three sites, Boxberg and Pillnitz and Brandis. The spatial distribution in 10 cm as well as the moisture profile to a depth of 100 cm has been measured applying a concept of recording moisture along a line under, between and at the edge of the panels and at a reference area. First measurements show a distinct soil moisture pattern as result of the modified rainfall distribution. At the reference point in Boxberg soil moisture during a rainfall event of 9.7 mm in Oct' 2017 rises by 4 % compared to 16 % under the edge of the panel.

Biography

Ulrike Feistel has completed her PhD in Environmental Sciences from International University Collage Zittau, Germany and Postdoctoral studies from Centre d'Etudes et de Recherches Eco-Géographique Strasbourg, France. For more than 10 years she worked as Senior Hydrologist in the Department of Water of Mott MacDonald Ltd Cambridge, UK. Since 2016, she holds the chair of Engineering Hydrology at the University of Applied Sciences, Dresden, Germany where she is in charge of the Master programme Environmental Engineering. She is leading the establishment of a German-Kenyan Centre for Mining, Environmental Engineering and Resource Management and other research projects focusing on hydrology.

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