Geophysical Research Abstracts
Vol. 21, EGU2019-2164, 2019
EGU General Assembly 2019

Crop redistribution; Food security and economic sustainability assessment using blue and green water footprint

Hamideh Nouri (1), Brian Stokvis (2), Sattar Chavoshi Borujeni (3), Alejandro Galindo (2), and Arjen Hoekstra (2)

(1) Division of Agronomy, University of Göttingen Von-Siebold-Strasse 8 37075 Göttingen, Germany P: +49 (0)551 39 24676, E:hamideh.nouri@uni-goettingen.de, (2) Faculty of Engineering Technology, University of Twente, 7500 AE Enschede, The Netherlands, (3) Soil Conservation and Watershed Management Research Department, Isfahan Agricultural and Natural Resources Research and Education Centre, AREEO, Isfahan, Iran

Water and food security are fundamental policies for most nations. However, implementing sustainable plans for food security is not necessarily in line with short-term solutions for water resources management particularly in semi-arid and arid regions. Adaptive sustainable agricultural practices need to be taken to lessening the stress on renewable and non-renewable water resources while national water and food security still consider as the foremost agenda. To reflect on the FAO-UN statement of "To secure food for everybody, we first need to secure water", this research assessed the impact of two adaptive management practices on the water and food security of the basin. These practices include short-term and long-term solutions; S1- mulching and drip irrigation and S2- optimized crop distribution. The impact of these two adaptive scenarios were compared with the existing agricultural practices on the annual green and blue WF, blue water saving, water scarcity, and food and cash production of one of the most water-stressed regions in the world, Upper Litani Basin in Lebanon. We investigated the impact of optimized crop redistribution in combination with multi-cropping on the blue water scarcity, food security and economic sustainability of the region. Our results showed that implementing mulch and drip irrigation will have a minor impact on the blue water saving, water scarcity, and food and cash production of the region compared to the significant positive impact of the optimized crop distribution. Optimized crop redistribution could increase green WF by 51%, decrease blue WF by 20% and increase food and cash production by 3% and 50%, respectively compared to the current practices. In contrast, mulching and drip irrigation could increase green WF by 2%, decrease blue WF by 4% and increase food and cash production by 2.1% and 1.5%, respectively compared to the current practices. This research demonstrates the potential of optimized crop distribution practices in achieving water and food security in arid regions.