Water footprint of crop production in Tehran province

ABSTRACT

Evaluation of supply chain of water consumption contributes toward reducing water scarcity, as it allows for increased water productivity in the agricultural sector. Water Footprint (WF) is a powerful tool for water management; it accounts for the volume of water consumption at high spatial and temporal resolution. The objective of this research is to investigate the water footprint trend of crop production in Tehran from 2008 to 2015 and to assess blue water scarcity in the agricultural sector. Water consumption of crop production was evaluated based on the WF method. Evapotranspiration was evaluated by applying the CROPWAT model. Blue water scarcity was evaluated using the blue water footprint-to-blue water availability formula. The results demonstrate that pistachio, cotton, walnut, almond, and wheat have a large WF, amounting to 11.111 m3/kg, 4,703 m3/kg, 3,932 m3/kg, 3,217 m3/kg, and 1.817 m3/kg, respectively. Agricultural blue water scarcity amounted to 0.6 (severe water stress class) (2015–2016). Agricultural water consumption in Tehran is unsustainable since it contributes to severe blue water scarcity. Tehran should reduce agricultural water scarcity by reducing the water footprint of the agricultural sector.

Keyword: Blue water footprint; CROPWAT model; Green water footprint; Water consumption; Water management