How evapotranspiration process may affect the estimation of water footprint indicator in agriculture?

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**ABSTRACT**

A critical component of water footprint (WF) indicator is the green WF that refers to the total rainwater evapotranspiration (ET) plus the water incorporated into the crop. From the definition of the WF the ET rate of an irrigated cropland needs to be reliably quantified especially in water scarce regions like Chania Valley in Crete. Based on this concept, different scenarios in terms of water consumption (basic and future) and hydrological conditions (average and dry) were evaluated. Furthermore, the WF was estimated, by applying different methods to calculate ET and effective rainfall, in order to determine whether the choice of the applied method may affect the agricultural WF estimation and lead to different outcomes as far irrigation water management practices. In this analysis, the WF was proven to be a useful tool as it is a multidimensional indicator \[1\], by determining the volume and the type of water use per ton of agricultural product. Furthermore, it was proved that the classification of crops (in terms of water consumption) varies slightly depending on the calculation method of different WF parameters. The actual ET is the most accurate option, since it takes into account the frequency and amount of irrigation and the soil moisture used by the crop. Finally, the variations between the various ET methods in the estimation of WF does not significantly alter the decisions related to the possible management plan of water resources of a region and the restructuring plan of crops in the policy-maker level.

**Keywords:** Water footprint (WF); Actual evapotranspiration (ET); Blaney–Cridge; Hargreaves; FAO Penman–Monteith; CROPWAT; Effective rainfall; Irrigation water management practices

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