

Interactive comment on “Benchmark levels for the consumptive water footprint of crop production for different environmental conditions: a case study for winter wheat in China” by L. Zhuo et al.

Anonymous Referee #2

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The paper presents a study for determining benchmark levels for the consumptive water footprint (WF of winter wheat production in China, considering the influence of different external environmental factors (rainfed vs irrigated, wet vs dry years, warm vs cold years, and across soil classes and climate zones). This is done using the FAO's crop water productivity model AquaCrop. Only water stress is considered as limiting factor. The objective seems to be to identify where WF reductions should be targeted. China is the main wheat producer in the world an increasing water use efficiency in wheat production is certainly a priority, especially for water stress regions. In this sense, the topic of study is certainly interesting and appealing and within the scope of the journal. However, I have several important concerns on the research presented:

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1) Green and blue water inputs are not separated for irrigated agriculture, while this has been done in previous studies (eg Liu et al. (2009), Global consumptive water use for crop production: The importance of green water and virtual water, *Water Resour. Res.*, 45, W05428). Please justify why this separation is not considered in this study. This distinction seems fundamental for the practical relevance of the study, since the WF reduction will mainly have implications in blue water, correct?

2) Besides the previous mentioned limitation, I miss more insight on the practical interest of the results. In order to be able to define where WF improvements are possible and what measures to take to create higher levels of water productivity, the factors that determine the current levels of water productivity must be understood. However, this approach does not really help much on this sense. Climate cannot be controlled and the influence of the managerial factors are not incorporated in this study. So for me it is unclear to what extent the differences found in WF values are just due to the local conditions and cannot be significantly modified.

3) The description on the modelling assumptions and calibration is too limited and it is needed for properly understanding the simulation done.

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