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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Assessing water footprint of wheat production in China using a crop-model-coupled-statistics approach" *by* X. C. Cao et al.

Anonymous Referee #1

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I appreciate your quick and detailed response. However, I still don't agree with some of your arguments:

Response 2: Right, potential ET is not what actually the crop water use and taking it will overestimate the WF. Yes, some of the works you cited have used CROPWAT and taken the potential ET without adjusting for the water stress condition. But you have missed a number of previous works which actually did calculate the actual crop water evapotranspiration instead of the potential. Some of these previous studies includes: Fader et al. (2011); Hanasaki et al. (2010); Liu and Yang (2010); Liu et al. (2007, 2009); Mekonnen and Hoekstra (2010, 2012); and Rost et al. (2008). Most of these

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works have used a more advanced modelling approach than the CROPWAT by taking the daily soil water balance and accounting for the potential soil water stress. You may include the above references in your literature review.

I acknowledge and appreciate your effort in collecting irrigation and other relevant data, which requires a big effort and is time consuming. I do understand how challenging it is. But I don't agree with your argument that you have done better!!

Response 3: You cited a text from the WF assessment manual. However, you should have gone further and read the next sentence, which reads as: "It is estimated by considering water consumption and pollution in all steps of the production chain". It clearly state that the WF is estimated by considering water consumption and pollution. So you can't support your claim that the water lost during conveyance should be add to the evapotranspiration and all be called WF. In short you can't improve a concept by changing its definition. I don't have a problem of you including the water lost during conveyance in your estimation but you can't call it WF. You can use other terms!! See Chapagain and Hoekstra (2011) – they have estimated the water lost through percolation but have not added it to the evapotranspiration and call all as WF. See Table 2 of Chapagain and Hoekstra (2011) - Total water use (WF + percolation). You may use similar approach or a better one!!

References:

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