Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-436-RC2, 2019

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Trade-offs between crop-related (physical and virtual) water flows and the associated economic benefits and values: a case study of the Yellow River Basin" *by* Pute Wu et al.

Anonymous Referee #2

Received and published: 8 February 2019

At the first sight of this manuscript, it seems to be an interesting topic that open new doors in the discussion of water use efficiency in crop production. However, it could be a big misleading. The authors evaluate the value of green and blue water equally, and the value of crops produced by blue water is only discounted according to the price of irrigation water. However, crop production that needs irrigation is generally facing deficit in water for crop growth without irrigation water, which means current production amount (or maybe quality of crop products) can not be gained only by rain water without irrigation. This reality is disregarded and simply the value of crops with irrigation

is underestimated in this manuscript. This could be a big misleading as the authors emphasizes the superiority of green water in terms of water economic efficiency in the conclusion. If the authors like to compare the efficiency of green and blue water, the production amount by green water should be reduced by considering the proportion of blue water contribution to the total production at least. However, the roles of green and blue water are obviously different, and any scientific values would not be created without more intensive discussion about the roles of both water. Moreover, the price of irrigation water is not determined only by abundance of water resources in a region, which means that consideration of only the price of irrigation is not enough at all (even if the price of irrigation is low (which indicates potentially higher value of irrigation), water scarcity may be severe, which means water use in a region is not sustainable.) Secondly, the authors discuss the values of different crops produced in a different region (as mentioned in the conclusions (p.13, L14-17), however, this could be also misleading. What kinds of crop we can produce in a region depends on other factors like climate and soil condition besides water. The authors seem to claim crops with high price are preferable than cheap crops. For income perspective, partly yes, but it is not so easy in reality. This simplification does not give any scientific value in the discussion of sustainable crop production and water use. There are still other major questions in technical aspects, but more than that, above issues are critical and I can not recommend to publish this manuscript. I would encourage the authors more intensive discussion especially on "what is the value of crop production and water use" in advance of public discussion.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-436, 2018.