

Interactive comment on “Basin-wide water accounting using remote sensing data: the case of transboundary Indus Basin” by P. Karimi et al.

C. Perry (Referee)

chrisjperry@mac.com

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I write this review on the assumption that the issues I have raised in relation to the companion paper are resolved. Primarily, those related to terminology, and as an example of the added clarity that “tighter” terminology would bring, I re-write below the abstract of this paper. Nothing appears to me to be lost in this version, but it is in my view a lot simpler and clearer than the original.

“The results for one selected year showed that total annual water consumption in the basin (502 km³) plus outflows (21 km³) exceeded total precipitation (482 km³). The deficit was supported by depletion of groundwater storage (30km³). The “landscape consumption” (in situ evaporation and transpiration of rainfall) was 344 km³ (69 % of

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total consumption). Surface water consumption was 158 km³ (31 %). Agriculture was the biggest water consumer and accounted for 59 % of the total (297 km³), of which 85% (254 km³) was through irrigated agriculture and the remaining 15 % (44 km³) through rainfed systems. Due to excessive evaporative losses in agricultural areas, half of all water consumption in the basin was non-beneficial. Average rainfed crop yields were 0.9 t ha⁻¹. In irrigated areas, over two crop seasons, total yield was 7.8 t ha⁻¹. Water productivity was low due to a lack of proper agronomical practices and poor farm water management. The paper concludes that the opportunity for a food-secure and sustainable future for the Indus Basin lies in reducing soil evaporation. Results of future scenario analyses suggest that implementing techniques to convert soil evaporation to crop transpiration will not only increase production but can also ease the pressure on the fast declining storage."

I also find the use of the term "basin efficiency" to be unhelpful. In irrigation terminology, "efficiency" usually means the ratio of water consumed to water applied (or similar). Here we have a basin where consumption is about 7% more than the supply. Does this imply a basin efficiency of 107%? Is that good? What level of basin efficiency IS "good"? In fact, the useful information is already here in the paper because we have excellent statements of the sources and uses of water. Interpreting these nice facts into "efficiencies" is a major step backwards.

As noted in reference to the other paper, I am also not persuaded that the blue/green partition of water adds anything to the discussion. The authors might review that issue and see what is lost by deleting this poetic approach.

It may be my reading, but an area where I am not clear is how the analysis treats rainfall on irrigated areas that (a) definitely contributes to crop T, (b) may contribute to crop T, and (c) does not contribute to crop T.

is this a manageable variable?

Very nice paper!

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