Hydrology and Earth System Sciences Discussions

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2021-409

Anonymous Referee #2

Referee comment on "A framework for irrigation performance assessment using WaPOR data: the case of a sugarcane estate in Mozambique" by Abebe D. Chukalla et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-409-RC2, 2022

- Does the paper address relevant scientific questions within the scope of HESS?

No. I find the manuscript more suitable for an irrigation or agricultural journal and less so for the HESS journal because it presents a framework for assessing irrigation performance on sugarcane. I do not find the manuscript suitable for publication in HESS.

- Does the paper present novel concepts, ideas, tools, or data?

HESS accepts articles that clearly advances the understanding of hydrological processes and systems, and/or their role in water resources management and Earth system functioning. The submitted manuscript does not fall under this scope.

- Are substantial conclusions reached? No. The article concludes that the framework can be used to assess performance indicators of irrigation systems. What is not reflected in the framework is how it assess the performance of irrigation systems without having integrating the amount of water delivered to each field.
- Are the scientific methods and assumptions valid and clearly outlined?

Units for equations in the crop yield section are missing.

- Are the results sufficient to support the interpretations and conclusions?

Statistical analysis (i.e. signifance of differences) is missing (e.g. Figure 5, Figure 6) /in error (e.g. correlation reported in not weighed by number of observations)

Conclusions are made towards uniformities of irrigation systems are not born by other works. For example, uniformity (coefficient of variation of ET pixel values within a field – which the authors state that it can be used a surrogate of irrigation application distribution – 75,75,85 and 65 for centre pivot, sprinkler, drip, and furrow irrigation, respectively), cannot be derived from satellite imagery without the quantification of applied water (not water consumed). Within field variability could be due to different soil types, diseases, topography, fertilization, protection practices, etc, and not necessarily due to water. The limitations of the WAPOR data as discussed in the manuscript poses some contradictions as to the conclusions arrived at in the abstract. The paper states that the framework is useful for assessing irrigation system perfromance and variability yet it admits that these differences could be due to non-water related factors (conclusion).

- Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? No, field data is not provided.
- Do the authors give proper credit to related work and clearly indicate their own new/original contribution?

It seems that the methodology is derived from FAO's WAPOR manual

- Does the title clearly reflect the contents of the paper?

Yes

- Does the abstract provide a concise and complete summary?

Yes

- Is the overall presentation well-structured and clear?

Yes

- Is the language fluent and precise?

Almost

- Are mathematical formulae, symbols, abbreviations, and units correctly defined and used?

Major equations lack units

- Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated?

Figures need statistical significance parameters

- Are the number and quality of references appropriate?

No, many references rely on reports and not peer-reviewed works.

- Is the amount and quality of supplementary material appropriate?

N/A