

Prof. Dr. Wouter Buytaert
Editor, Hydrology and Earth System Sciences (HESS)

02 December 2024

Re: Submission of revised manuscript (HESS-2024-37)

Dear Prof. Dr. Buytaert,

On behalf of all the co-authors, I would like to thank you for the opportunity for revise and submit our manuscript entitled ‘*Green water availability and water-limited crop yields under a changing climate in Ethiopia*’ (HESS-2024-37). I also forward our sincere gratitude to Seifu Tilahun (reviewer 1) and Rike Becker (reviewer 2) for their unlimited commitment to devote their time to review our work, and for their constructive comments and suggestions that improved our manuscript.

In this round of revision, we have made the following minor revisions to the manuscript based on the suggestions we received from our reviewer Rike Becker:

- A brief clarification on the figures we prioritized to present in the manuscript has been added
- The consistency of nomenclatures used in the manuscript has been checked and updated throughout the paper
- The legend of Figure 10 has been updated to indicate the reference of the changes in AY
- The unpublished work has been replaced by its published version in the revised manuscript

The changes made have been indicated in the manuscript with tracked change.

Enclosed are our responses (*in blue*) to the reviewer’s comments (*in black*). The page and line numbers mentioned in the responses refer to the manuscript with tracked changes.

Kind regards,

Mosisa Tujuba Wakjira,
On behalf of all co-authors

Reviewer 2

General Comment

The authors have thoroughly revised their manuscript. A newly added chapter on potential uncertainties and limitations of the studies now substantially extend the discussion section and discusses shortcomings of the analysis. Figures were updated and/or moved for conciseness. The results are now compared to other similar studies in Ethiopia and agreements or disagreements are outlined in more detail. I accept the authors' responses to my previous concerns and only have a few minor comments:

We thank very much Rike Becker for the thorough evaluation, constructive feedback and invaluable suggestions.

Point 2.10: I understand the authors' reasoning behind the selection of the figures (focussing on Meher instead of Belg). A very short explanation for the reader, why you select these figures could help the reader understand your choice. Similar to your answer to my question.

Thank you very much for this suggestion. We have briefly added this to the first paragraph of section 3.3.2 (Lines 398-399, page 18). The paragraph now reads (In italics are the added sentences): "*In the face of the expected warmer and mostly wetter climate across the RFA region of Ethiopia, the GWA is likely to increase. Here, we present the expected changes in GWA in Meher (Figure 8), as an estimated 88 % of the total grain production in Ethiopia occurs during this season. The expected changes in Belg are shown in Figure S5 of the supplementary materials. In Meher, SMD is expected to decrease by up to 5 % over a large part of the region in the 2030s under all emission scenarios (Figure 8). However, in the 2060s and 2080s, SMD is projected to increase by 3-15 % over the western, southwestern, and southern parts under the low and intermediate emission scenarios. This is expected, given the projected minimal change in rainfall under the warming climate over these regions*".

Double check the consistency of nomenclature: sometimes capitals are used, sometimes small letters. E.g. 'belg' vs. 'Belg'. 'meher' vs. 'Meher'.

Thank you. We have checked this and made corrections throughout the manuscript.

Fig. 10: what do you mean by 'data1' in legend of Fig. 10? Replace with 'Reference AY' or something similar.

Thank you for pointing this out. We have replaced 'data1' with 'ref' in Fig. 10.

Line 449: check the journal policy if you can cite your own unpublished work. I am not sure, if this is allowed. Some journals have a particular policy on this.

Thanks. The paper that was under review has now been published. We have used the published version in the revised manuscript.