

The authors thank the referee for constructive comments and recommendations which will help to improve the readability and quality of the paper.

Please find below the replies to reviewer #2

The authors present an interesting study which considers validation of SWAT simulated stream-flow in the Eastern Nile, and sensitivity to climate change. The simulations are based on the application of SWAT, which is one of the most widely used models on aspects of hydrology and climate change. The work presented represents the application of available methods and, although is neither innovative nor ground-breaking, does represent research that is clearly of importance to water management in the region. Furthermore, the lack of long-term reliable hydrological data in some of the regions of study justifies the application of hydrological modeling technique applied here.

Reply

We are very much grateful to your general comment about this study and its importance to water management in the region.

(1) However, the methods chosen and applied should be better justified, particularly with respect to their application in such area, and not only within the concerned Ethiopian Regions. Reference to more recent studies which have adopted the empirical equations, most importantly, the climatic change scenarios are very imperative in this respect, especially if one is to have confidence in the results.

Reply

We have added some newer references to the introduction and added a section explaining the climate scenarios (section 3.8).

(2) Considering the title as it stands, I suggest that a better one be found. I have in mind limiting the topic to something like "Sensitivity of SWAT simulated stream flow to climatic changes within the Eastern Nile River Basin". This, however, would suggest that the authors perform an inclusive overhaul in terms of the references, methods, results and discussion. Many of such studies do exist in the Nile River basins, and the author can draw lessons from such references as:

Reply

The title has been changed to as 'Sensitivity of SWAT simulated streamflow to climatic changes within the Eastern Nile River Basin'. We have modified large portions of the climate sensitivity text.

(3) The authors should try to capture corresponding details in the abstract, with summarized aspects of purpose of study, methodology, results and conclusions, and perhaps some recommendations. As it exists now, a lot of content seems thrown around and about. According to the present title, the authors have two aspects which can be precisely captured in the abstract: (a) Calibration and Validation, and (b) Sensitivity to climate change. Both of them are very interesting to the readers.

Reply

We have modified our abstract to make the two aspects of the paper more clear. The abstract now contains the main results of the calibration/validation and then the main results of the sensitivity test. Thus, we hope the structure of the abstract is clearer.

(4) Generally, the language in the entire text is wanting and requires revision. Perhaps involving, an experienced authority in the language may be necessary. For instance, the authors should explain what he means by total average flow in line 4 of the introduction, or what he means by simple hydrological model in line 7 of the introduction. My experience is that sometimes what appears simple may not be so always.

Reply

We have revised the language of the paper, so hopefully it is more readable. Line 4 in the introduction part is now replaced by 'average flow' in the revised manuscript. Similarly for the word simple is canceled.

(5) Kindly check the references, and their structuring. I.e. Mohammed et al. (2005) ... (and again) . . . (Mohammed el al. 2005) at the end of the sentences. Also check reference section for overall consistency.

Reply

We have corrected the typographical errors in the references and their structuring in the revised manuscript.

(6) I would suggest the introduction to focus more on studies and justification of the existing methods for purposes of identifying the objective of this particular study. For example, an introduction to the GCM and their application not only within the Ethiopian region, but also elsewhere of good proximity is important for the title. What come out as it presently exists is that the author only applied reverse approach i.e. the capabilities within SWAT, which may not be true.

Reply

We have modified the introduction and included references to justify the method (e.g. *Jha et al.(2006)*, *Taye et al., 2011*). In the new section explaining the climate scenarios (section 3.8) the GCMs are introduced.

(7) Could the locations of the study area be more precisely described? What about the morphometrics in a table? Kindly choose one name to use for the tributaries instead of putting them in bracket always. Normally, a common name is better, with the subsidiary being bracketed for the very first time. If possible, summarize and describe the details of each tributary in a paragraph in a consistent manner.

Reply

The location of the study area is given by the outermost latitudes and longitudes of each sub basin and a map of the sub basins was already included. A description about the major tributaries is further discussed in section 2. However as referee #1 ask for a shortening of this section, we have tried to keep this brief. Drainage areas are now given in Table 3.

(8) Use conventional colors for the GIS layers in Figure 1 (i.e. blue for rivers etc). Also check the Map Scale. It does not look very realist as it stand now. If it does, then kindly check the scale of the data sets (land use and soils etc). Somehow, something may be missing somewhere. Choose a good interval for the DEM. Maybe you avoid no data legend as it is the same as the last interval. Generally, properly structure the map contents for balanced visibility in all the figures.

Reply

Figures have been fixed, including realistic map scale, conventional colors and reasonable scaling of the DEM map.

(9) In the methods and materials section, generally check the language used please i.e. Explain what you mean by the word extracted? Also, some texts in the section (i.e. in section 3.5) look like results unless properly re-packaged. To avoid redundancies, avoid repeating within the text what is already illustrated by the figures. Again, avoid all the generalities since SWAT details can be found online nowadays. Confine yourself to what you did for your study area.

Reply

The word 'extracted' changed to 'obtained' in section 3.4. We have rephrased section 3.5 to avoid

redundancies in the main text which was already illustrated by the figures.

(10) The first part of the results looks like part of literature review. Explain what you mean by verification? Generally, add more study specific content on the results since some of the staff here are general for SWAT. Discuss into details and specifically the results obtained. My personal opinion is that you should add more details into the climate change part through a more professional discussion and justification.

Reply

As commented by referee #1 we now use validation instead of verification. A more detail description about climate change part is added, including a separate section describing the scenarios (section 3.8) and revised text in the results section.

(11) In the summary and conclusion, try to relate the model estimates to other work in the region. Sharpen the language for enhanced readership. The last paragraph in the section is somehow confusing.

Reply

We have redrafted the last paragraph in the revised manuscript. We have tried to relate the model estimates of our manuscript with other peer review work, but this was mainly done in the introduction where we state the result of several papers. To avoid repetition we have not included this in the summary and conclusion section.