



## ***Interactive comment on “Critical review of the application of SWAT in the upper Nile Basin countries” by A. van Griensven et al.***

**M. Volk (Referee)**

[martin.volk@ufz.de](mailto:martin.volk@ufz.de)

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This is a valuable and much needed review on SWAT applications in the upper Nile basin countries. The basin plays a central role as source for drinking water, irrigation and process water for industries for millions of people in several countries, which also has international effects. Demographic change, migration processes, land use and climate change impacts lead to environmental and health problems in large regions of this basin. Integrated models can help to evaluate some of these processes and trends, but also to support alternative land use and management options in order to mitigate negative effects. Hence, such reviews as the authors present helps to bundle modelling activities, indicate collaboration and data problems and reveal modelling

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flaws that should be avoided in the future. The paper could be a valuable contribution to the journal. It is well written and includes a bunch of helpful information on the topic as well as suggestions for improving simulation procedures and setting up common databases in the future, etc. I would suggest minor to moderate revision, which is mainly because of some ideas for structural or wording changes of the paper. I have listed my recommendations, comments and suggestions below that hopefully help the authors to improve the paper. In general, I would like to congratulate the authors for this work.

Title: I would change the title to "Critical review of SWAT applications in the upper Nile Basin countries".

Page 3762: Abstract: line 1: "..integrated river basin model" instead of hydrological simulation tool" line 5: Better land use change consequences or impacts (instead of land use modelling)? Otherwise it could imply that is used for land use scenario development. line 6: "..clustered"? I guess you mean that the majority of the studies are focused in the tropical highland? I think "focused" would better fit here, or? line 8: I would use "appropriate" or "feasible" instead of knowledgeable. You could also add a hyphen after this sentence and add "which is also a consequence of the quality of the available free database in these regions". Just a suggestion. line 15: "A number of criteria are used.." Add here "in the reviewed studies, because one could think that you used these criteria to evaluate the models / studies. Just to be clear. line 20: "Several papers also..." Did they report unrealistic parameter values or did they use unrealistic parameter values? line 22: "..., it is difficult to give..." It is not your duty to give an overall positive evaluation - I would change the wording here, something like "have to be evaluated critically" would fit better, I guess.

Page 3763: Abstract (continued) line 1/2: Remove "try to" line 3/4: Write "predictions of future environmental changes" instead of "predictions of the future.." line 7: You could add a sentence stating that it should be aimed at the generation of common model parameter databases and simulation results for the Nile basin.

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Page 3763: Introduction lines 10 to 19: I would avoid to use too much listings. Try to shorten that part, perhaps you could refer to a table or a reference (Arnold, Gassman, etc.)

Page 3764: Introduction (continued) line 14: I would add a sentence here that states the great importance of the Nile basin for water availability, climate, ET, etc. It would underline the importance of your study (see intro of my review above). It could also be helpful to introduce to the structure of your paper.

Page 3764: Case study and model descriptions line 15 (title): I would change the title to "Case study and review process". You could add here a short introduction to the structure of the following chapter and sections.

Add 2.1 The Upper Nile Basin.

Page 3765 line 10 to 14: I would move that section to the new point 2.0 Case study and review process), see above.

Page 3765: Model calibration, .... line 28: write "...one-factor-at-a-time (LH-OAT).."

Page 3766: line 21 to 25: Please change wording.

Page 3767: Land use change line 10: Section title: I would add "impacts" or "consequences" after "changes".

Page 3771: Evaluation criteria line 10: I would write "The appropriateness of the models in the reviewed papers is..." In addition, I would introduce to the structure of the following chapter. To be honest, I had at first some problems with the structure, since the titles / criteria of the sub-sections 3.1 to 3.3 are repeated in the next chapter - which makes of course sense, but on the other hand it can be confusing for some readers to read the same titles in two different chapters. Perhaps you could think about restructuring and merge the two chapters. But finally, it is up to you. Just think about it.

Page 3780: line 3 to 4 (second point): I think you should also add the soil physical

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parameters here. line 13 to 15 (sixth point): I would cite here somewhere the work of Arnold et al. (2010) and Bosch et al (2010) here where the authors present the idea of the SWAT landscape version.

Arnold, J.G., P.M. Allen, M. Volk, J.R. Williams & D.D. Bosch (2010): Assessment of Different Representations of Spatial Variability on SWAT Model Performance. Transactions of the ASABE 53(5), 1433-1443.

Bosch, D.D., J.G. Arnold, M. Volk & P.M. Allen (2010): Simulation of a Low-Gradient Coastal Plain Watershed using the SWAT Landscape Model. Transactions of the ASABE 53(5), 1445-1456.

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