Point-by-point response

Dear Anonymous Referee #1

Thank you very much for your comments and recommendations to improve the quality of the paper. All the recommended improvements were already done to the document. The title was modified using "sub-catchment discretization", the structure of the document was improved trying not to mix methods and results, and more literature was included.

On the specific comments:

-The abstract was corrected and the results of SUFI2 were included.
-The introduction was enriched by adding more information on current hydrological modelling in the region and by comparing the work performed by other studies in the UBNRB.
-The structure of all the citations in the text and in the reference list were corrected to meet the requirements of HESS.
-The reason why CFSR data didn't work for Roth and Lemman (2016) was added.
- Ministry of Water, Irrigation and Electricity was corrected.
-A scatter plot showing the statistical significance of the degree of matching between CFSR and ground data was added. The data shown in this paper is the only data that we were able to collect, therefore comparisons with other probably available stations were not done.
-A better explanation of how the data integration was done was added.
-The description about SUFI2 was improved, and an explanation about p and r-factors was added.
- The phrase "the of quality of SWAT model" was modified, it was meant to be "reliability of the model"
-Yes, the SWAT Error Index is a totally new idea introduced for first time in the region. Since there is no available measured ET, the idea was to use MOD16 with the objective of showing how SEI works. A second test was done in the Ribb sub-catchment and it is shown in this corrected version of the paper. This time the results of the ET are better
-For the water balance components, more literature review was done and the results from Mengistu (2012) were added to table 1. Although these values were not exactly taken as basis for our models, they did help to obtain approximate values.
-Yes, most of the stations are located in the eastern part of the UBNRB, but unfortunately it was not possible to obtain more data, although it might be possible that a few stations for the western region exist.
-Yes, the SEI values between the ground and the integrated dataset are very similar, but the improvement provided by the integrated dataset can be shown on their NS values. The current problem with SEI is that the low NS values provided by a dataset (due to the flow discharge overestimation) is compensated by its better NS (due to a better match with the ET-which is underestimated-). Therefore the second test in the Ribb sub-catchment was

aiming to have a better test, and indeed, it did provide a much better SEI values, however it could still be tested in another regions.
-p and r-factors from SUFI2 were included in table 4.
-The conclusion were modified and more recommendations on further studies were given.
-The SWAT models for the UBNRB were again run and the water components values and statistical values of the tables were updated.
-Names of tables and figures were corrected and a vertical axes was added to all the graphs.

Dear Anonymous Referee #2

We appreciate very much your corrections and suggestions provided to improve the content of this paper. All the improvements and changes suggested were already done trying to find a balance between the recommendations given by both reviewers. In the general context, the structure of the document was improved and modified so several repetitive parts were removed.

On the main concerns: (i) The title was edited as recommended by Referee #1. (ii) A better explanation on the data integration was given. (iii-iv) More literature was reviewed and values for water balance based on Mengistu (2012) was added. More comparisons with previous hydrological models of the UBNRB were done. The results from literature were not used as basis to calibrate our models, however they helped as good guide to obtain approximate values of the water balance in the UBNRB. (v) A second SEI test was done at the Ribb catchment, it did provided better SEI values, however, further tests and improvement could still be done on this index (vi) Since there is not measured ET data available, the idea of using MOD16 ET was to show how SEI works, although now is clear that MOD16ET does not represent very well the evapotranspiration of the UBNRB it was possible to achieve better results for the Rib-subcatchment. (vii)The conclusions were improved. (viii) uncertainties and also r and p-factors were given.

On the specific comments:

-The abstract was improved and SUFI2 results were presented.
-Nash Sutcliffe (NS) was corrected.
-The phrase “the integrated model represents the land use and soil conditions” was removed, because yes they are the same on all the models.
-The introduction was improved and more background on hydrological modeling was done and also on the effect of sub-basin discretization.
- All the references were corrected and given based on the HESS guidelines.
-The phase “problems concerning the evapotranspiration: : :.” was corrected, it was meant to be referred to the fact that analyses of evapotranspiration values are not often given for the UBNRB.
-A better and more detailed explanation on how the data was integrated and compared was given in section 2.4
-The official sub-basin distribution and soil map was included.

- Section 2.3 and 2.6.1 were shortened although in section 2.6.1 an explanation of p and r-factors was added following recommendation from Anonymous Referee #1.
- Yes, the same parameterization was used for both discretization levels and for the three datasets (this was added in text too).
- A second test was done in the Ribb sub-catchment and it is shown in this corrected version of the paper. The results of the ET are much better this time. It was possible to perform a calibration where the evapotranspiration of the Ribb sub-catchment was not compromised, and in this example, R2, NS and SEI achieved good results.
-Based on the results of this research I would recommend 87 as the adequate number of sub-basins. However if an optimal number of sub-basins is to be defined based on the limited number of station, with the objective of including every single stations, sub-basins could be added manually.
-Considering the pros and cons that both datasets have, the objective was to find which dataset provided better results and trying to find a solution, a dataset that could as much as possible have the pros from both datasets.
-Yes, improvements at Kessie are very small, further studies of this integrated dataset in small catchments upstream Kessie should be performed.
-The phrase "the calibration of Kessie were good for models using the ground and integrated datasets in statistics as well in terms of water balance" was removed, as it is right, a general comparison of the water balance values was only done with values for Eldiem based on literature.
-The calibration was done using the Hargreaves method because under the Penman Monteith method it was not possible to calibrate the model, the flow discharge was way too high and was not possible to get an evapotranspiration rate higher than 45-50%, unlike Hargreaves where the evapotranspiration rate is approximately 60%.
-The conclusion were modified and more recommendations on further studies were given.
-Name of figures and tables were corrected, the axis of all the graphs was improved. Figure 3 was modified and the graphs were numbered (A, B, C:….) and referenced in the text.