

# ***Interactive comment on “Analyzing the future climate change of Upper Blue Nile River Basin (UBNRB) using statistical down scaling techniques” by Dagnenet Fenta Mekonnen and Markus Disse***

## **Anonymous Referee #1**

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The topic of the impact of CC on precipitation and temperature over the Blue Nile is very important, in particular for precipitation. Several researchers investigated the same topic, and found no consensus on future rainfall over the Upper Blue Nile. The analysis of historical records of precipitation also showed no consensus, though majority of results showed no trend of change, while clear increasing trends for temperatures during the last 50 to 100 years. The disagreement among researchers on results of future precipitation has also been quoted in this manuscript (p1, l11). The question is, what is the new knowledge given in this article? This is not clearly discussed.

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The objective of the paper, and hence analysis carried out, could have been more structured. Is it an evaluation of downscaling methods? is it evaluation of climate model results for future precipitation and temperatures? or both ? This is an important point to improve readability of the paper.

The paper gives a lot of details and too many numbers make it very difficult to follow a clear story line that serves the key message of the paper. E.g., evaluation is made at individual stations, and then for the whole catchment (p11, l23), and large differences were found among the models for the later. What does this mean for the overall uncertainty of the analysis?

The paper has too many tables and figures. The readability of the paper could have improved, if limiting the analysis to precipitation only.

P1, l11, “However, a large uncertainty between different Global Circulation Models (GCM) and downscaling methods exist that makes reliable conclusions for a sustainable water management difficult.” This is known for many years now, please give what is new that the reader is expecting from this paper.

P1, l14, LARS-WG, SDSM; give full name when appears for first time in manuscript The Abstract is not easy to follow. Try to mention the key message (objective) of the paper, and key results, without many details. Too many models, and too many numbers makes it difficult to grasp the main findings of the paper.

P2, l15, climate change and climate variability mentioned on the same line. What is the difference between variability and change, please make critical discussion on this issue.

p3, l8, there are more studies on Upper Blue Nile climate, e.g., Tesemma et al., 2010; Gebre et al., 2014, Beyene et al., 2010, among others

P3, l13 to 15, “Therefore, the objective . . . .”, here you can explicitly mention the objective of the paper, and why it is different from previous published research? Is it

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evaluation of future climate over the Upper Blue Nile; Is it evaluation of the downscaling methods? Why to do downscaling? Could the result be feasible to be used for hydrological analysis, e.g., to compute runoff ? discussing these points may allow to clearly define the objectives of the analysis

P5, I11, why using IPCC 4th report (2007), and not IPCC 5th report (2013) ?

P5, I15, 6 best performed models, how selected? mention few lines about criteria, and selection process.

P24, Fig. 3b: is it daily or monthly temp.

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