

Interactive comment on “Intensification of the hydrological cycle expected in West Africa over the 21st century” by Stella Todzo et al.

Anonymous Referee #1

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Reviewer comment on Intensification of the hydrological cycle expected in West Africa over the 21st century by Todzo et al. General comment This study investigated the hydrological cycle over West African region using CORDEX-AFRICA data between 2006 and 2099. To achieve their purpose, authors used the known ETCCD indexes combined with hydroclimatic indice. They found that West African region is expected to be warmer than the global average per decade (0.5o C vs 0.3o C). Also precipitations are expected to become more intense and less frequent. This is a very interesting work and address relevant scientific questions in the scope of ESD. Data and methodology are clearly stated as well as main findings. However the writing style is too amorphous from beginning to the end making this interesting fining a bit boring on reading. Please below see my suggestions to improve the manuscript:

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Major comment Authors discussed how the MCSs may impact precipitation distribution over the studied though these MCSs were not considered in the CORDEX data. A similar attempt should be done for others forcing such as aerosols especially dust that are abundantly present in the region and known to impact West African climate through their radiative forcing: Konare, A., et al. "A regional climate modeling study of the effect of desert dust on the West African monsoon." *Journal of Geophysical Research: Atmospheres* 113.D12 (2008). N'Datchoh, E. T., et al. "Dust induced changes on the West African summer monsoon features." *International Journal of Climatology* 38.1 (2018): 452-466. Yoshioka, Masaru, et al. "Impact of desert dust radiative forcing on Sahel precipitation: Relative importance of dust compared to sea surface temperature variations, vegetation changes, and greenhouse gas warming." *Journal of Climate* 20.8 (2007): 1445-1467. Silué et al., (2019) Evidence of Long-Term Trend of Visibility in the Sahel and Coevolution with Meteorological Conditions and Vegetation Cover during the Recent Period. *Atmospheric and Climate Sciences*, 9, 346-368. doi: 10.4236/acs.2019.93025.

Minor comments L30 - L32 "Growing season": I guess it refers to agriculture however, as stated links are that clear for the reader. I suggest authors to include a sentence relating precipitation to the agriculture before this statement. L36: Authors stated "tropospheric moisture and precipitation is highly complex" Is it in the world or very specific to the studied region? Please specify it. L72: please change "Following" by or "base on" it looks quite monotone to use "following" L92: Please add a connector between statements to make the text flow L102: please replace "than" by "with" L112 – L114: please edit the sentence by making it more clear. The statement is confusing and look more like figure label. Across the entire manuscript, authors stated "according to" more than 10 times when commenting and discussing figures. It makes the manuscript quite monotone I suggest some of these should be change may be rewrite a little bit differently using statement such as: From Figure ... Figure ... suggests /implies ... (Not exhaustive)

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Though the active form writing style is correct and show the authors efforts and work, it may be interesting to have some variation in the manuscript with the passive form too.

Similarly, all figures comments start by "Figure xx shows" however these statements can be write differently to allow the manuscript to be more alive. For example, L158-L160: Statement can be rewrite as: "The annual values are shown in figure 4"

L162: All three regions please replace by "all the three regions" L169: please write "explain about" L170: please replace "as for" by "similarly to"

Interactive comment on Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2019-38>, 2019.

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