

Interactive comment on “Analysis of causes of decreasing inflow to the Lake Chad due to climate variability and human activities” by Rashid Mahmood and Shaofeng Jia

Anonymous Referee #1

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In order to understand the recent changes in Lake Chad, the authors have gathered the available climatic and hydrological data (observed and from international databases) from 1951 to 2015. They identified a change point in the sequence of rainfall and Chari River discharge (around 1971). The trend before 1971 is attributed to climatic changes, while the trend after 1971 is attributed to both climatic and human impacts. According to the authors, the human impact (mostly from irrigation development around 1970 in Nigeria) represents a major part of the decrease in discharge during the second period.

The attribution of the main change in Chari discharge mainly to irrigation development is not substantiated and seems debatable for several reasons: i) the large Nigerian

C1

irrigation schemes developed in the early 1970s have never been in operation because of the rapid recession of Lake Chad at that time and ii) the amount of irrigation impact involved by the authors (in the order of 10 km³/year) would feed some 500 000 ha of irrigated land that are not identified on the ground nor by satellite observations. Although the rain decrease is clearly described, its impact on vegetation and land cover, on ground water level or soil surface should probably be discussed.

In a region where quite a number of francophone authors have published papers, only one out of about 60 references quote a paper in French.

See also comments in the manuscript

Please also note the supplement to this comment:

<https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-139/hess-2018-139-RC1-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2018-139>, 2018.

C2