

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2021-378

Anonymous Referee #1

Referee comment on "Drastic decline of flood pulse in the Cambodian floodplains (Mekong River and Tonle Sap system)" by Samuel De Xun Chua et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-378-RC1>, 2021

This study analyzed the changes in flood pulse in the Cambodian floodplains from Stung Treng station and found a drastic decline of flood pulse in 2010 - 2019 when comparing to the pre-dam period (1960 - 1991), by simply using the surrounding hydrological observations. The study is well-structured, however, there are some issues in the data and analysis.

This study tried to disentangle the contribution from upstream hydropower dams to the changes of flood pulse in Cambodian floodplains as well as the Tonle Sap Lake, by simply comparing the difference in 1960 - 1991, 1992 - 2009, and 2010 - 2019.

The first issue is that the authors did not consider the changes in climate in the basin, especially precipitation. The Mekong River Basin has experienced large inter-annual and -decadal variations in precipitation. Without considering the changes in precipitation, which makes it very hard to draw the conclusions.

Second, the authors point out the increasing sand-mining activity within the river channels, especially in Cambodia (from Kompong Cham to the Vietnamese border); and if such sand-mining has altered the channel morphology, which can lead to change in channel hydrology and observations. Hence, without taking such impacts, using the water level data from the stations within the river channels would not be reliable.

Third, the authors showed the water level reduction due to incision and water withdrawal (in Table 3), however, there is very limited description of the method, which made it hard to judge the results.

In section 4.1.3 changes to rise and fall rates: the authors discuss the changes to rise and fall rates in different drought periods, and found increases in these two indicators. They argue that the increases hint at anthropogenic hydrological regulation in the region. However, I don't see a clear connection between the indicators and anthropogenic hydrological regulation. Please elaborate more.

In Figure 4: The authors showed the changes in discharge in Prek Kdam and water level in Kompong Luang in different time periods. However, the time periods are different, which are not comparable directly. Would be better to show the figure with the same time periods, e.g., 1996-2009, 2010-2018.