We thank the reviewer for his/her valuable comments. We have looked through the suggestions and will make the necessary amendments.

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.

Indeed in our manuscript, we recognise the significance of precipitation and have considered its impact from lines 290-295 and Figure 8 as follows:

Also, as observed in Figure 8, measured rainfall in the Cambodian floodplains has remained roughly constant from 1960-2019, in line with observations via other sensing methods (Raghavan et al., 2018; Singh and Qin, 2020; Thoeun, 2015). Thus, the observed reduction of flood discharge in the Cambodian floodplains cannot be attributed solely to either upstream developments or natural climatic variability – local anthropogenic factors are likely the main reason.

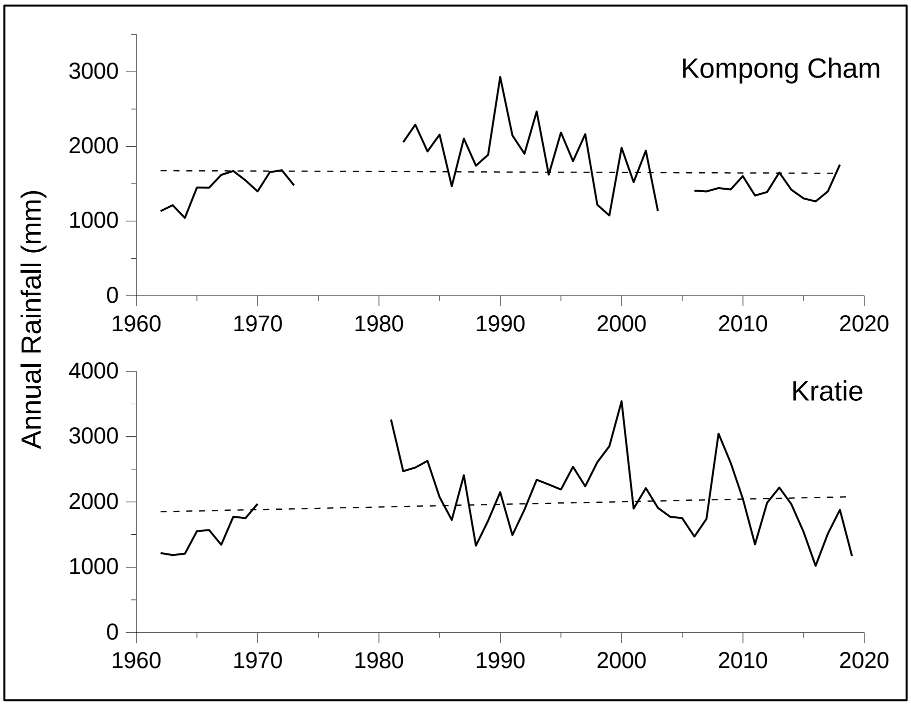


Figure 8. Measured precipitation data at Kompong Cham and Kratie from 1960-2019. At both stations, there are no statistically significant trends in rainfall within the data period.

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.

The water level data obtained for the respective stations in the Cambodian floodplains are actual measured data. Our analysis of floodpulse characteristics is based on actual values and is thus, reliable. Furthermore, regardless of its cause (changes in water amount or changes in channel morphology), the fact remains that water levels have generally decreased in the flooding season, and with it, a reduction of the floodpulse inthe floodplains along the channel.

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.

Thank you for the suggestion. We will include a more detailed description of the method as per below:

(Line 325)

We estimate the contribution of sediment decline and irrigation to the reduction of water levels by comparing water level changes at the start and end of the flood season. At the start of the flood season in July, minimal water will be diverted for irrigation as the fields will be flooded naturally. Thus, changes in water levels in July will be caused predominantly by incision. Conversely, at the end of the flood season in December, water from the receding floodwaters will be diverted for irrigation in anticipation of the dry season. It is also during this period that diversion amount is at its greatest. Therefore, the changes in water levels in December will reflect influences from both irrigation and incision.

In the absence of man-made hydrological alterations, water levels at upstream Kratie will be tightly coupled with those at downstream stations throughout the year. However, as seen in Figure 9, water levels at Neak Luong and Chaktomuk have been decreasing with respect to water levels at Kratie. In other words, for the same water level at Kratie, the water level at Neak Luong/Chaktomuk has decreased from the 1960s to 2010s.

To estimate the separate contribution of incision versus water withdrawal as seen in Table 3, we compared water level changes (ΔWL) in July and December. Since water level reduction in July in caused mainly by incision, it follows that:

$$\Delta WL_{caused\ by\ incision} = \Delta WL_{July}$$

In December, water level changes are caused by a sum of both incision and water withdrawal. Thus,

$$\Delta WL_{caused\ by\ water\ withdrawal} = \Delta WL_{December} - \Delta WL_{caused\ by\ incision}$$

$$\rightarrow \Delta WL_{caused\ by\ water\ withdrawal} = \Delta WL_{December} - \Delta WL_{July}$$

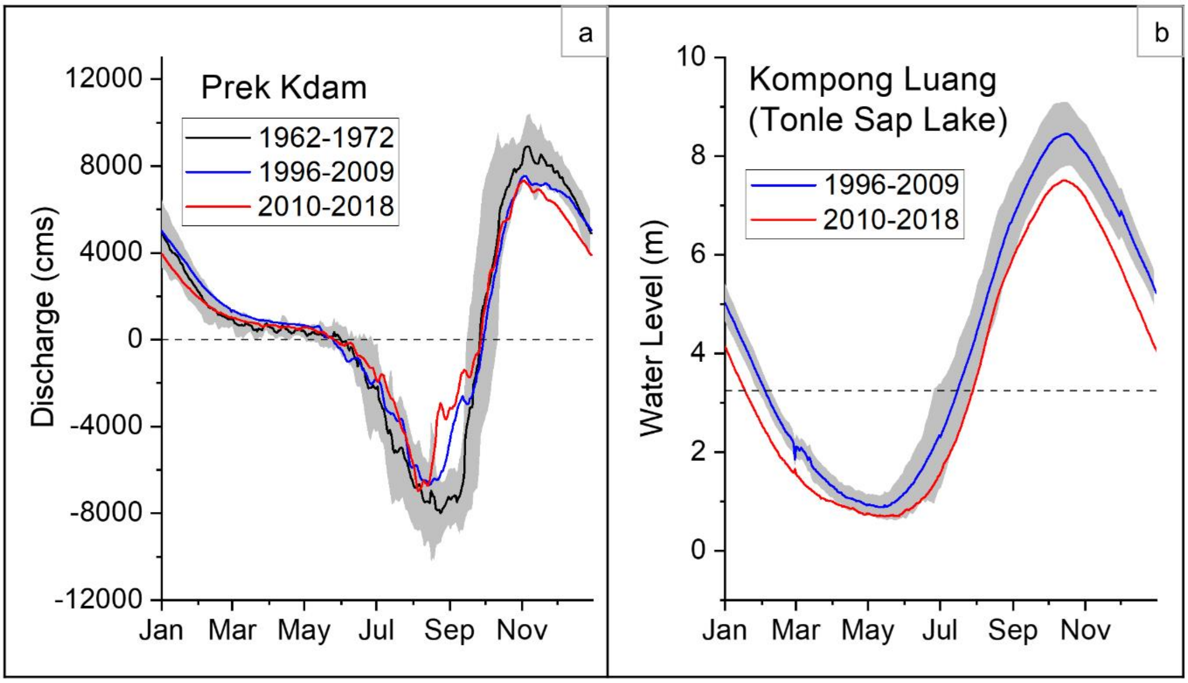
However, this method assumes that channel morphology at Kratie has remained constant from 1992-2019. If the channel at Kratie have undergone erosion, then our estimates for water level reduction due to both incision and water withdrawal would be lower than actual values.

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.

Changes in rise rates and fall rates reflect influences of upstream water infrastructures. During the rising limb of the wet season, reservoirs would have to release the water stored during the dry season in preparation for the incoming water (Richter et al., 1997; Singer, 2007). Also, the presence of irrigation canals increases the conveyance speed of floodwaters across the floodplains, resulting in an increased rise rate. After the wet season, upstream reservoirs or irrigated fields would retain water (Cochrane et al., 2014). As flows to the main channel is reduced, the fall rate would be correspondingly higher.

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.

Thank you for your suggestion. We have altered our calculations and have made the necessary changes.



References:

Cochrane, T. A., Arias, M. E. and Piman, T.: Historical impact of water infrastructure on water levels of the Mekong River and the Tonle Sap system, Hydrol. Earth Syst. Sci., 18(11), 4529–4541, doi:10.5194/hess-18-4529-2014, 2014.

Richter, B., Baumgartner, J., Wigington, R. and Braun, D.: How much water does a river need?, Freshw. Biol., 37(1), 231–249, doi:10.1046/j.1365-2427.1997.00153.x, 1997.

Singer, M. B.: The influence of major dams on hydrology through the drainage network of the Sacramento River basin, California, River Res. Appl., 23(1), 55–72, doi:10.1002/rra.968, 2007.