

Interactive comment on “Quantifying human impacts on hydrological drought using a combined modelling approach in a tropical river basin in Central Vietnam” by A. B. M Firoz et al.

Anonymous Referee #1

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Authors estimate reservoir impacts on hydrological drought using a catchment hydrological model combining with reservoir routing approach in a tropical river basin in Central Vietnam. The topic is interesting as it gives how extent of the reservoir operation affects seasonal variation of streamflow and thus drought occurrence in the extremely uneven distributed precipitation region. The used approaches are able to quantify the reservoir effects on streamflow. However, some conclusions need to further illustration. (1) Generally, the construction of reservoirs is to reduce the drought by smoothing streamflow variations (increase water release in the dry season and decrease the release in the flood season). However, it could shift the drought occurrence (e.g. Fig. 9). So I don't agree with authors' conclusions “we found a stronger hydrological drought

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risk for the anthropogenically impacted reconstructed streamflow". (2) In the study region, one of the main effect on streamflow in the two streams is the water division from VuGia to Thu Bon. The division increases streamflow at Nong Son station and decreases streamflow at Thanh My station (Fig 7 A and 8a). So I am very interested how this water division influence drought occurrences at two streams in addition to reservoir operations. Authors need to give clear illustrations. (3) Authors only described "the reservoir should release a minimum of 25 m³s⁻¹ water from the reservoir to the Vu Gia river (MOIT, 2011) (Page 9). How much the division amount between the two streams was used in the study? (4) The whole study is focused on the reservoir operation including water division influence on drought. So I suggest that the topic should change to be "reservoir impacts on hydrological drought. ...". Human impacts are too broad as authors don't quantify other human influences, such as land use and land cover. (5) So in introduction, descriptions of the previous studies on modeling approaches for quantifying human activities on hydrology should be focused on mostly reservoir operations and regional water division. (6) rainfall-runoff model J2000 should be calibrated and validated by using observed streamflow discharge before reservoir operation. (7) Line 20 on Page 11: "The flow during the rainy season decreased by -2 to -38%" refers to which stream? (8) In discussion, it is not necessary to describe generally known uncertainty of the modelling. Authors can discuss uncertainty in lack of more observation data in sub-basins, e.g. calibrated parameters from one sub-basin (station) used for other sub-basins. (9) Conclusion should be revised to focus on how extent of the reservoir operation affects seasonal variation of streamflow and thus drought occurrence in the extremely uneven distributed precipitation region.

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