

Comment on hess-2021-476

Anonymous Referee #1

Referee comment on "Influences of land use changes on the dynamics of water quantity and quality in the German lowland catchment of the Stör" by Chaogui Lei et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-476-RC1>, 2021

This paper shows a comprehensive investigation of the influences of land-use changes on the dynamics of water quantity and quality using SWAT. The manuscript Yet, I have some concerns.

- My biggest concern is if the methodology you applied here fits the study's purposes. Specifically, the model is set up, calibrated, and validated using the land use map of 2019 as a static input. Then the authors applied the land use maps in 1987 and 2010 as scenarios with the parameter setting calibrated with the map of 2019 as input. The land-use maps are inherent catchment characteristics. Moreover, the years of the land use maps are within the simulation period. From my perspective, they are not scenarios. Therefore, they should be all used as forcing in the model set up and calibration, e.g., as in Anand et al. (2018). By doing so, the authors can still do the same calculations to investigate the influences of land-use changes on the water quantity and quality dynamics. Please justify the reason for using the land use map of 2019 as a static input for model set up and calibration instead of forcing with all land use information that you have.
- The predictor and response variables for the PLSR are not well described. I suggest using a table to summarise or equations to describe the changes. How the changes are calculated is not clear.
- The calibration processes are very difficult to follow. Please rephrase it. Is there autocalibration? If so, please specify how the objective functions are defined, and what algorithm is applied. Only giving the information of the package is not enough.
- In Figure 6, the notation of stars should be clarified.
- In Figure 7, what is the baseline of all the comparisons?

Anand, J., Gosain, A.K. and Khosa, R. 2018. Prediction of land use changes based on Land Change Modeler and attribution of changes in the water balance of Ganga basin to land use change using the SWAT model. Science of The Total Environment 644, 503-519.