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Comment on hess-2021-32

Fabrizio Fenicia (Editor)

Editor comment on "Can the implementation of Low Impact Development reducebasin runoff?" by Xinxin Sui and Frans van de Ven, Hydrol. Earth Syst. Sci. Discuss.,
<https://doi.org/10.5194/hess-2021-32-EC1>, 2021

Dear Dr. Sui:

Thank you for submitting your manuscript entitled: "Can the implementation of Low Impact Development reduce basin runoff?" to HESS. I have received 2 reviews for your manuscript, both of which requested major revisions. The reviews highlight important points that should be addressed in the revised version.

Please note that I have not found a detailed answer to the general comments of referee 1, but only to the edited PDF. If the authors believe there is duplication, they should highlight it.

A point of major concern is that although the model is defined as semidistributed, it is in fact intended to produce predictions only at the basin outlet. I would argue that a defining feature of a semidistributed model is the ability to provide predictions at internal subcatchments [*Boyle et al.*, 2001]. The question is therefore how, by using data at a single outlet, one is able to disentangle the behavior of multiple HRUs, such as rural and urban. As the model is empirical, it requires calibration, and the disentanglement of the HRUs has to be based on data. With semidistributed models, the behavior of individual HRUs is identified by calibrating of multiple subcatchments, ideally with different HRU proportions and different responses. I think in this study, by calibrating multiple HRUs on a single catchment, there is a strong risk of equifinality.

Complementing the reviewers' assessment, I also think that the methodology should contain more details on calibration and validation, and generally should anticipate the structure of the results sections. Currently, many analyses in the results are presented without being anticipated in the methods section, which makes the results difficult to read.

In summary, the papers requires major revision in order to address all the reviewers concerns. In submitting the revised version, please provide a point by point response to all the raised comments, therefore complementing the replies already submitted.

References

Boyle, D. P., H. V. Gupta, S. Sorooshian, V. Koren, Z. Y. Zhang, and M. Smith (2001), Toward improved streamflow forecasts: Value of semidistributed modeling, *Water Resour Res*, 37(11), 2749-2759.

