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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Impacts of future climate change on urban flood risks: benefits of climate mitigation and adaptations" *by* Qianqian Zhou et al.

Anonymous Referee #2

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SHORT COMMENTS IN THE JOURNAL STYLE Scientific questions. Adaptation effects on drainage performance in a context of climate change (CC) is relevant. Novel concepts. Try to quantify the impact adaptation measures is potenti<lly new if appropriately developed in single case studies. Substantial conclusions. Not attended yet, due to insufficiently explained datasets and methods. Scientific methods and assumptions. Not clearly outlined. Results vs interpretations/conclusions. Unattended. Description. Pretty obscure. Authors proper credit. Ok! but not all is new. Title. OK! but to be revised in case of revision. Summary. Unbalanced on Climate trends when the most interesting part is adaptation. Overall presentation. Lacking of context outline. Language. To be revised by a mothertongue, that I am not. Formulae. Not expert enough

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to say. Parts to modify. Develop 1, 4 & 5, Clarify 2a & 2e, Reduce 2b, Delete 3b, Modify Fig. 1 & 5. References. Ok.

EXTENDED COMMENTS

1 Introduction All key definitions should be provided here. Flood riskis the probability an hazard has to generate damages (UNISDR, ISO etc. . .), not a probability of a disastrous flood only (that is hazard occurrence). Should be wise to specify to whom this work is addressed, since very essential information of the case study is missing (see next sections).

2. Material and Methods 2a) (i) A characterization of the hazard (rainfall) in Hohhot City ismissing. (ii) A detailed description of watershed soils is reccomended. Rocky, lateritic, clay, sandy, or. . . soils perform differently in semi-arid contexts than in wet contexts. Even where infiltration seems possible some pervious looking soils after the first minutes turn into impervious. Context matter in this type of study. (iii) Authors consider permeable pavements, infiltration trenches and green roofs as possible adaptation measures. Which are the permeable soil and coverage rates in the different parts of the watershed considered?

(iv) Can the authors provide some information about last disastrous floods in the case study? Areas affected the most, etc.

2b) (i) It's quite normal to use more than one GCMs . (ii) Reader expects to learn from the expected changes in rainfall (mm and in which month) but no information is provided on this topic.

2c) (i) Which rainfall information has been used to run SWMM [dataset length (years) and type (daily, three hourly, hourly, etc.)]?

2e) (i) The adaptation measures considered are to reduce the amount of water that run off. This is one side of the problem. The other one is to slow down the water speed. And for this no measure is considered: there is a wide range of measures for semi-arid

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contexts commonly used for this. I recommend to consider it or explain why you don't.

(ii) How Authors have determined the impact of individual adaptation measures (permeable pavements, trenches, green roof) over run off reduction? This should be explained.

3) Results 3b) (i) I don't understand the approach: Mitigation is expected to impact on CC at long term (decades...). Drainage system is expected to reduce CC impacts at short-medium term (1-5 years). Is obvious that adapting we can't expect to see effects on rainfall...

4) Uncertainities & Limitations (i) The consideration of the state of drainage system could be a limitation of this study? A drainage system obstructed by vegetation, waste or artefacts (cables, pipes, temporary constructions) can make the outcomes of the SWMM quite distant from the real world. And change also recommendations... that need to be extended to waste sector.

5. Could the Authors consider to show us what is their way forward?

Figures 1 & 5: scale is not showed: how large are blocs contoured by drainage network?

0. Manuscript's title Show the name of the case study and the country. Limit to Adaptation, delete mitigation, delete risk.

END

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