

Interactive comment on “Urbanization and climate change impacts on future urban flood risk in Can Tho city, Vietnam” by H. T. L. Huong and A. Pathirana

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The presented manuscript brings a contribution for the study of flood risks in coastal areas, which are under high urbanization demands. Climate change is an important factor to be considered in the study of the future flood risk. The presented case study is done in the city of Can Tho in Vietnam, which is one of the representative cases of a city under high pressure of urbanisation.

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The study presents a methodology which uses three types of models to see the impacts on flood risks. While each of the models, taken separately are well studied in the literature, the interesting addition to the present study is the effect of the urbanisation on the local rainfall. However the value of this contribution could not be properly assessed because the models are not described in enough detail, nor are available the papers where they are described. References to submitted papers are made, which is not at the reach of the reviewer. Moreover the description on how information is supplied from one model to the other so that there is consistency during calibration and validation of the models, it is not available. The model are lacking a clear description on how they have been validated, and here I am in particular referring to the first statement on page 10796 “after a satisfactory result is obtained from the simulation and validation of the model setup”, without giving any details what satisfactory means and how validation has been done. It is very much important to validate properly the model used, especially when information is used from one model to another. Having said that I would suggest that the presentation of the application part should focus on showing how good the developed models are, and only then start presenting the predictions that these models can give for the future.

Some specific comments: The paper has many places, where it states very general notions. Though this is good I would suggest avoiding such statements if there is no clear link after that with the study itself. For example on page 10783, line 16 +17 the statement “the hydrometeorological changes and resulting impacts on extreme rainfall is also being established”, is very general, and it is not clear if this is established in a WMO/GWP?2008 report, or it is established in the present study, etc. I would recommend a thorough check of these kind of statements and discard some of them, making more space for the description of the work done in the study.

On page 10787, line 20, it is specified that river level reached 1.9 m, but what does this mean for flood risk, what is the acceptable river level before flood hazard occurs it is not given.

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While mentioning the scenarios, applied to the hydrodynamic model, the authors are always making the assumption that the upstream boundary condition for the river will be a raise in discharge. Did they look into the alternative that many dams will be build in the upstream part of the river, dams that will give a totally different river flow, including less discharge upstream. Could the authors test in their modelling cases what would be the minimum upstream discharge for which flood risk will appear.

In section 4.1, when future urbanisation model results are presented, they are only assessed for the year 2035 and 2050, though the manuscript mentions that the study is done until the year 2100. Is there a reason not to present the year 2100.

The authors are mentioning often “controlled numerical experiments”, which is not very clear what do they mean. Numerical experiments in which certain parameters are controlled is known, but in this presentation it is not clear hat the authors meant. Could you please, explain what is controlled?

On page 10801, first paragraph of Section 5.3, lines 6-9. The authors are very strong with their statements, and are advising the reader to be cautious in interpretations. How? On the same page, next paragraph the authors are mentioning that the climate change will influence the “nature and magnitude of the extreme rainfall events. How this influence will interact with the urbanization-lead rainfall remains to be studied.” Do not the authors contradict themselves here? Was not this the main interest initially? While reading, the main research interest when urbanisation model was developed, was to see how, under climate change conditions, urbanization will influence the local rainfall? This conclusion could be also a drawback of the fact that the models are not explained in enough detail. If climate change is not taken into consideration in the land change models than what would be the value of the atmospheric models prediction for the local rainfall pattern.

A small comment, some of the figures are difficult to read, legends are very small.

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