



Interactive
Comment

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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Personally I think that this paper has well achieved its key purpose to simulate/project the impacts of both urbanization and climate change on future flood risk of Can Tho city as the most important city of the Mekong River Delta in Vietnam. We should remember that the authors have not just tried to conduct a “generalized” or abstract study but rather a focused case-study on a concrete city in a concrete location of the Vietnam’s Mekong Delta, with its specific problems and future growth demands. It might be a great contribution and asset for a better-informed urban planning by Can Tho city’

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planners and authorities as well as for the serious adaptation planning process which the Government of Vietnam is encouraging for the highly vulnerable Mekong Delta area. By trying to consider and combine both global and local impacts and using three different models, the authors showed an innovative approach in the efforts to look into the future and help to do the urban planning as much realistically as possible. Not being a modeler or hydrologist, my comments will therefore focus on science-policy nexus or its practical implication.

First thing I would recommend the authors to mention in the discussion or conclusion is to highlight or elaborate on how concretely and if possible, practically the results of this study or its approach, methodology could be used by the Can Tho city' planners and authorities, as well as by other big cities in the region. Many of them (closest example is Ho Chi Minh city) are currently facing or will face in the near future similar problems and very high flood risk due to both climate change and urbanisation. Recent devastating consequences with high casualties, enormous damages and economic losses of flooding in Bangkok area and other similar cities of the Lower Mekong Basin have shown the clear need for better practical implication and possible extension/continuation of this study. With this view, it might be good if this study could indicate (or point out in the future study need) the changes in seasonality of flooding pattern (e.g. what could be the time/month of the year when highest flood peaks or worse scenario could happen as combination of high tide, extreme local rainfall and higher upstream flow in future).

Besides, I have similar comment as other referees (Dr I. Popescu and Dr H. Apel) that it is important to consider (or at least mention in the study limitation) trans-boundary effects of possible upstream development, especially if dams would be build in the lower part of the Mekong river in Laos and Cambodia, or from other adjacent provinces/areas. It's also important to understand that sea level raise and tidal effects may come not only from the Hau river estuary (from South China Sea) but could also come from Gulf of Thailand through many canals linked with the Cai Lon river of adjacent Kien Giang province (western coast line of Mekong Delta) with totally different tidal regime and

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seasonal fluctuations (linked with South-Western monsoon).

Ideally, some other socio-economic factors should be mentioned more specifically as future scenarios/situations such as: i) potentially significant “climate-induced” migration from other coastal areas/cities, ii) increase in financial/investment flow and possible appearance of new and “expensive” industrial areas near Can Tho city, iii) possible adaptation measures which the city authority are likely to undertake in this climate change context, including both constructive measures – e.g. potential flood-regulation facilities or more flood-release canals to Gulf of Thailand through existing canals, and non-constructive measures – e.g. adaptive urban planning, enforcement of flood-proof construction code etc.

It might be useful to emphasize in the sections on “discussion” or “limitation” that this study is only focusing on flood risk, not really on flood vulnerability (which is different from flood risk). As result, although the future flood risk are likely to be increased in Can Tho city due to variety of factors, actions towards reducing flood vulnerability by raising the resilience/preparedness of communities and related economic sectors or locations (of city development) is an utmost priority and a kind of non-regret option for Can Tho city's planners and authorities.

Some specific comments:

Page 10782, lines 22-23: “The results show that, if the city develops as predicted, the maximum of inundation depth and area in Can Tho will increase by about 20 %”, this statement should include the year/time of prediction/projection (e.g. by 2050, as indicated in page 10799; or by 2100?);

Same page, lines 24-26: it probably should be “The worse case may occur if the sea level rises 100 cm and the **increased** flow from upstream happen in the highdevelopment scenarios”.

Page 10790, lines 5-10, since this part is about “Anticipated situation in the future”, it

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would be better if the authors also mention that (or consider these factors), with strategic location of Can Tho city and the significant increase of population in the Mekong Delta in general and urban population in Ho Chi Minh city (as a biggest urban and industrial conglomerate) in particular, *there will be significant increase in “climate-induced” migrants and industrial, financial/investment flows into Can Tho*. This scenario is very likely to happen due to sea level raise and storm surges leading to deterioration of living condition and environment and due to much higher risk of investment in Ho Chi Minh city and the other cities/ industrial areas locating near the coastal line of Mekong Delta. This factor could significantly increase the city’s flood risk and vulnerability due to higher density (of both population and industries) and higher potential losses and damages from flood.

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