

Interactive comment on “Assessing impacts of dike construction on the flood dynamics in the Mekong Delta” by Dung Duc Tran et al.

Anonymous Referee #1

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The authors used a hydrology model to evaluate the relationship between dike construction and the hydrography during the flood season in the Vietnamese Mekong Delta. In general, this study is interesting and important, considering the frequency of flood events and high-density dike constructions. However, the impact of artificial construction on flood dynamic obviously has been extensively studied in many previous literature, so I would not say this is a novel study although the numerical modeling method is rarely seen. There are several issues that needed to be addressed before the paper can be accepted in HESS. I recommend a major revision with further review by the editors and referees.

Here are some comments in the manuscript:

P1, Ln19: I expect the authors to explain and define some technical terms/words at
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the first time in the paper, such as the high-dike and semi-dike. In addition, please use the consistent word throughout the paper, for example, correct the August-dike to semi-dike.

P1, Ln22-23: This sentence needs to be rephrased: ... is assessed through the flood hydrographs modeling under different dike density scenarios in 2011 and 2013.

P2 Ln2: What is a Quadrangle? I don't think it is a right word for hydrology study. Try to use the watershed name.

P2, Ln18-20: I don't suggest to write the future work in the abstract, since it is not part of the authors' work reported in this paper. Also, the authors mentioned that the historical monitoring data are absent, so it is actually difficult or even impossible to do the future assessments.

P3, Ln2-8: The information of economic and food production is too detailed within this paper. Try to shorten this part.

P3, Ln9-17: The economic cost and loss are not related to the scientific question in this paper.

P5, Ln1-3: The authors used one point observation to demonstrate a clear correlation between the dike construction and water level. There is no clear evidence showing the cause and effect between the dike construction and water level. In addition, I don't suggest to write one data point in the introduction part.

P5, Ln9-24: I recommend the authors to cite the reference right after each reason of flood risk (Ln10-11), instead of explaining each reference separately in detailed. The other reasons associated with the flood risks are not strongly related to the scientific questions discussed in this paper. And, are these studies focus on the same study site (Vietnamese Mekong Delta) as well?

P6 Ln22-23: I suggest the authors highlight the gap of modelling approach within this manuscript. The previous studies of modelling approaches and applications should be

addressed in the introduction as well.

P8 Ln4: What is a.m.s.l?

P9 Ln3-5: Again, move these explanations forward to help readers understand their meanings.

P8 Methodology section: I think a more detailed introduction of the hydrologic model and software are necessary, including the governing equations and physics used in the model, their applications, pros and cons, etc. The authors can't just cite the references.

P11 Ln5-7: How did you select these Manning coefficients? Any references? And, try to use a clearer word rather than "global" to avoid misunderstanding.

P14 Ln19: I'm confused about the Q-Q plots in figure 3. What does each point represent? Are they daily simulated and observed streamflows? If yes, the authors should consider the time-series plot for the streamflow results.

P15 Ln12-13: The x-axis of figure 4 should be the distance instead of the sites. I expect the explanation of underestimated simulated streamflow to be right after the figures. P15 Ln20: Should be 2011?

P17 Ln5-6, Ln 15: A general comment: The authors should use more quantitative criteria to demonstrate either the difference or similarity between different scenarios. Statistical measures are highly desired.

P17 Ln 20-23: The authors should provide a more detailed explanation of the "hinge response". A modified hydrograph as forcing should be presented in the paper as well to help readers understand the "hinge response".

P21 Discussion section: In general, I think the discussion section is too long and verbose. The discussion must be shortened with clearer statements for each analysis. The authors can also try to reconstruct the discussions with results section to help the readers better understand the highlighted study results.

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P26: Again, a reconstruction of discussion and conclusion sections is needed for this paper. I strongly recommend the authors to use bullets to clearly state the major findings of this study in the conclusion part.

Tables and figures should be listed separately. Why did you list the peak water levels in Table 4 instead of plotting in the figures? Probably try to plot the peak water levels under different dike construction as well unless any other reasons.

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