

Interactive comment on “Infrastructure sufficiency in meeting water demand under climate-induced socio-hydrological transition in the urbanizing Capibaribe River Basin – Brazil” by A. Ribeiro Neto et al.

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The reviews and Editor's comments have been extremely helpful.

With the resubmission we uploaded detailed responses to the review comments.

Here we would like to respond to the Editor, in particular:

"reframing the focus of the paper and restructuring the paper in a way as to bring out the need for a coupled model (coupled socio-hydrologic model)"

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- In socio-hydrologic terms the initial manuscript submission only accounted for hydrologic impacts on social systems, i.e., it was essentially a unidirectional model. In the revised submission we have described the bidirectional linkages of human impacts on hydrology and hydrological condition (especially through infrastructure and adaptive management at a range of scales – from large inter-basin transfer projects to household rainwater cisterns). The modeling has been upgraded to account for these adaptive responses to hydrological conditions. We have also discussed (but not formally modeled) hydrology and water-resources impacts on human settlements (decentralized vs. concentrated). We believe this is in line with the Editor's comment: "building such a coupled model is beyond the scope of this paper".

"the inability of traditional IWRM approaches to manage the system on such long timeframes, and how the present work contributes towards that effort"

- We understand that inherent uncertainty increases in both socio-hydrologic process and modeling terms when we consider century-long timeframes. For example, most assumptions point toward increasing human populations, but this is only a decades-long view. The demographic projections show a peak in the 2040s, for example, with significant reductions beyond that over the period for which hydroclimatic projects (and infrastructure plans) must be considered. This raises the potential applications of socio-hydrologic models. For example, in the Conclusions we mentioned that "The next master plans in the Capibaribe River basin may consider the use of modelling to assess climate change scenarios with the objective of evaluating strategies for mid- and long-term management".

- We hope that this approach addresses the Editor's comment "given the time frame of prediction used (to the end of the 21st century) and the rapid pace of climatic and demographic changes, socio-hydrology is particularly relevant, and the move towards a coupled socio-hydrologic model is completely appropriate".