

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1  
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## Comment on hess-2021-431

Anonymous Referee #1

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Referee comment on "The limits to large-scale supply augmentation: exploring the crossroads of conflicting urban water system development pathways" by Jonatan Godinez Madrigal et al., Hydrol. Earth Syst. Sci. Discuss.,  
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This is an interesting paper in which the authors seek to integrate socio-hydrology and hydrosocial approaches to analyse conflicts around supply augmentation projects. The methodology used by the authors involving a participatory modelling exercise is of particular interest as it has the potential to inform research in other contexts. I believe the author could further work to 1) further engage with hydrosocial research in the analysis of the cases, 2) provide more details helpful for the reader to understand the cases and further discuss the modelling exercise. I provide some suggestion toward this end below. I would also suggest the authors to consider to reduce the material presented in this paper. My impression is that in the paper there is enough material to actually write two papers: one in which the development pathway crossroads of the two cities are analysed in-depth through a hydrosocial/socio-hydrology lens (as Kallis, 2008 does for Athens or Savelli et al. 2021 for Cape Town) and one in which the modelling exercise is analysed as a tool to open up the decision space in conflict situations. I am looking forward to reading revised version of the manuscript.

- The authors could engage in a more in-depth hydrosocial analysis of the case presented. To give three concrete examples. The authors mention in the introduction that "large supply augmentation is based on sanctioned discourse and vested political and economic interests" (p.2), they also quote Lane on the need to pay attention to the relations of social power (l. 107) but this does not come back in the analysis of the cases, at least not so explicitly. The sections on the co-evolution of the water systems and society trends focuses on describing the decisions of the water utilities and the governments – a chronicle of proposed and failed projects is provided – however, less is said about the uneven relations of power and the wider discourses shaping these decisions – i.e. the authors underline economic growth, does modernization also play a role? And neoliberalization? Another missed opportunity in the application hydrosocial thinking is in the discussion of the modelling exercise. The different scenarios are evaluated according to indicators and the conclusion states that there are trade-offs – trade-offs are part of every water governance decision if one understands water

governance as a political process like hydrosocial research does. What would be interesting and novel is to discuss the different scenarios in light of hydrosocial approaches: what are the socio-political-dynamics in these different scenarios/trade-offs, which shifts in power-relations between actors would they entail? Would these shifts be progressive in terms of water (re)distributions and politics? Moreover, in the conclusion it would be interesting to reflect on how/if the approaches of Kallis (2008) and Molle and Wester (2009) in the analysis of urban water trajectories are advanced when combined with sociohydrology.

- The authors refer to the works of Kallis (2008) and Molle and Wester (2009) – both studies were published more than ten years ago and, in the meantime, a growing body of hydrosocial literature has emerged that the authors could engage with – see for instance the papers part of a Special Issues on rural-urban water transfers (Hommes et al. 2019) and the work of Hommes and Boelens 2017. It might be worth engaging with recent works on non-networked trajectories – see Allen, Adriana, et al. "Water trajectories through non-networked infrastructure: insights from peri-urban Dar es Salaam, Cochabamba and Kolkata." *Urban Research & Practice* 10.1 (2017): 22-42. And relatedly, I would encourage the authors to be explicit about their understanding of the term "urban water supply system". I am wondering, for instance, has augmentation been pursued also because of the widespread tendency to prefer one networked water supply system over other non-networked realities?
- To better understand the lock-in situation you are describing, it would be helpful to have a bit more background about decision-making in relation to the Zapotillo project (i.e. you mention that the project was approved and announced in 2005, by whom? What happened between 2005 and 2013 when the project was halted? Who decided to halt the project? Who is involved in the local network of social actors that opposes the project?)
- It would be also interesting for the reader to know a little more about the socio-economic and water access situation within the two cities – how does the majority of resident access water? Is water distribution unequal across the city? This would help to better contextualize the discussion – and critique – concerning the focus of the water utilities on non-revenue water, higher tariffs and the choice to invest in augmenting supply. Perhaps a table summarizing the main events in the infrastructural development of the two cities would be helpful for the reader.
- For the reader it is a bit difficult to follow the presentation of the model results (and table 1). How do you (and the actors involved in the process) conceptualized a "sustainable and socially just urban water system"? Perhaps you could include some of the information currently in the supplementary material in the main text. For instance, few insights on the definition of the indicators, i.e. > 95% coverage, would be helpful (p.3 supplementary materials).
- The research questions/objectives could be moved to the introduction; they are now included in the methodology section (l.161-166).
- In the conclusion the authors write "the trajectories of both cities have been defined by its continuous and unrestrained socio-economic growth" (l. 476) and later on explain that this growth has been promoted by a specific paradigm. Hence, wouldn't be more accurate – and in line with political ecology analysis – to state that the trajectories of the cities have been defined by a paradigm that promotes population and economic growth?

There are few minor comments that I invite the authors to consider:

- I.90 'supply-demand cycle' the authors could further introduce what is the 'supply-demand cycle' as this is further referred to in the analysis. The study of Kallis referred in the paper is from 2010, not 2008.
- Interviews are referred to as Pers.comm (I. 395), anonymous interview (I. 402) or simply with the reference to the position of the interviewee (I.420) choose one format for consistency
- Several acronyms are not spelled out (PRI, SAPAL, CONAGUA, etc.)
- Should conagua be capitalized or not? Please check for consistency.
- Section 3.2.2 and section 3.2.3. have the same title
- I.255 "social perception" this is quite vague perhaps you could specify whose perception was or use another term such as public perception
- I.51 I am wondering if the potential of alternative solutions is disputed only by water managers or also by wider coalitions including donors' agencies, financial institutions, local politicians, etc.
- I. 286 please revise. Which project are you talking about here?
- Some of the references are not included in the text (i.e. Hommes et al. 2016)