

Interactive comment on “Unravelling intractable water conflicts: the entanglement of science and politics in decision-making on a large hydraulic infrastructure project” by Jonatan Godinez-Madrigal et al.

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Dear Jeroen Vos,

We thank you for your comments, we found them insightful and they will certainly help to improve the quality of the paper.

Conceptual framework. Regarding your first comment on the conceptual framework: “I think it is much clearer to see the “epistemic uncertainties and ambiguities” as political choices of the modellers. The variables in the model reflect the value the factors have

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for the modellers. Not taking into account the ecological status of the downstream river, or the historic, religious and cultural value of the church in Temacapulín are political choices. This does not become clear by calling that choice an “epistemic uncertainty, understood as the ignorance of the functioning of a given system”, or an “ambiguity, understood as multiple knowledge frames” (line 73). Those choices are not so much an issue of understanding the functioning or having the right knowledge: it is instead about political choices (based on interests, valuing and worldviews).”

Answer: We believe that the main question here is whether the technical choices made by the modelers were politically motivated or were a consequence of not managing or understanding ambiguity properly, including that of the modelers themselves. The reason we prefer to discuss ambiguity instead of referring to political choice directly is to remain neutral about the level of conscious intent behind the choices made in the model. The simultaneous presence of multiple valid, and sometimes conflicting, ways of framing a problem that constitutes ambiguity is in essence a result of differences in values and worldviews. As such, it strongly relates to the appearance of political choices, whether consciously based on ambiguity or not. However, to answer this question we would need to interview the modelers; and, as explained in the answer for your following comment, that was not possible. Therefore, we considered both hypothesis, as shown in lines 484-485: “So, even if UNOPS did not deliberately indulge in the manufacture of ignorance, their research suffered from tunnel vision.”

If politically motivated, the technical choices would corroborate Boelens’ hypothesis about the Manufacture of ignorance, which is described in the conceptual framework and analyzed in the discussion and conclusion of the paper. However, UNOPS’ reports and the model itself indicate that, to a certain extent, the modelers took into account environmental flows and the interests of Temacapulín. They evaluated environmental flows immediately after the Zapotillo dam, but dismissed the ecological contribution of the Verde River to the Santiago River, as mentioned in line 441. And then, considered one scenario where Temacapulín would not necessarily need to be relocated (i.e. third

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scenario in Figure 3, with a dam of only 80 meters height). The concepts of epistemic uncertainty and ambiguity helped explain how UNOPS determined the system boundaries that delimited their model (e.g. that the environmental flows for the Santiago river were outside the scope of their objective, which was to study the Verde River Basin; note that UNOPS was not the first to omit the Santiago river; also for example Wester did so in his comprehensive PhD thesis on the Lerma-Chapala basin); and how UNOPS framed in their model the interests of Temacapulín, by considering one scenario where the communities are not necessarily flooded, and later discarding this scenario based on the obvious conclusion that it would not fulfill the accorded water allocation to the three regions. As previously said, it is difficult to understand the motivations of these technical decisions without interviewing the modelers in depth. We will change the wording of lines 484-485 to make this analysis clearer: “So, even if UNOPS did not deliberately indulge in the manufacture of ignorance by building a water resources model based on political interests, their research suffered from tunnel vision by inadequately managing the ambiguity of the conflict.”

Method. On your first comment about method: “It would be good to include better scrutiny of the position and work procedures of UNOPS. As part of the methodology it would have been interesting to collect data on, and do interviews with, the involved experts from UNOPS. Why did they make the model? Why did they not take into account the actors, factors and alternative solutions? Were they aware of their political role (or did they believe themselves in their political neutrality)?”

Answer: We actually had the same questions. We requested numerous times meetings and interviews with the modelers during summer of 2017, when the entire UNOPS team was stationed in Mexico. Our requests, along with other researchers from local universities, were ignored. Since the modelers were not Mexicans, once they delivered and presented the results, they all went back to their countries of origin. We continued to request for interviews, albeit electronic ones, and we were still ignored. Therefore, the answers to all those pertinent questions can only be inferred; but we preferred not

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to speculate about them in the paper.

On your second comment about the method: “Furthermore, it does not become clear what role the UNOPS model outcomes have played in the development of the controversies over the El Zapotillo project. It would have been interesting to research more on how the different stakeholders have used, and reacted to the report of the model outcomes (as set out in lines 216-217). This could give a much more detail description than the general “many actors were negatively surprised” in line 227-8 and the brief description of responses of Temacapulín’s representatives and academics in lines 388-393.”

Answer: That we find an excellent suggestion. Many actors released public statements, which are available online, condemning the results of UNOPS. We will therefore include the most relevant statements in the revised version of the paper.

Argumentation. Regarding the first comment on argumentation: “The Figures 3 and 5 need more explanation. In Fig 3 the allocated flows do not coincide with the allocated flows mentioned in lines 222-223.”

Answer: The allocated flows mentioned in lines 222-223 are: 8.6 m³ /s, 4.8 m³ /s and 7.5 m³/s. These flows represent the aggregated flow of water to be allocated by the dam to the three regions, for three kind of scenarios (the first value refers to scenario 1 and 2, the second to scenario 3, and the last one to scenario 5). Figure 3 shows the disaggregated allocated flows to each region. In the revised version we will modify the text to make this clearer.

On the second comment about the argumentation: “The Conclusions assert that co-production of more transparent and trusted knowledge will help to resolve conflicts. This might be true to some extent, but interests of stakeholders depend on (geographical, socio-economic and institutional) positions and valuing of certain costs and benefits more than others. More and better trusted knowledge will not overcome these differences.”

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Answer: In lines 500-501 we acknowledge the limitations of co-production of knowledge: "This might not be a panacea against vested interests (Molle, 2008), but can be an improvement to identify arbitrary decisions in public policies by hegemonic actors." We recognize that although irreconcilable interests and positions maybe inherent to water conflicts, co-production of knowledge can limit the instrumental use of knowledge as a hegemonic tool against non-technical actors, which is a step forward to fairer conflict resolutions. In addition, we will clarify the importance of managing the co-creation of knowledge with appropriate methods, acknowledging the potential backfiring of more knowledge per se, in reference to Dewulf et al. 2011.

On the third comment about the argumentation: "Several typos, missing words and awkward wordings could be corrected in a thorough proof-read."

Answer: We will revise the paper again to correct the typos and missing words in the revised version of the paper.

Best regards,

Jonatan, Nora and Pieter.

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