

Interactive comment on “Economic impacts of drought risks for water utilities through Severity-Duration-Frequency framework under climate change scenarios” by Diego A. Guzmán et al.

Anonymous Referee #2

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The manuscript entitled 'Economic impacts of drought risks for water utilities [assessed] through SDF framework under climate change scenarios, presents a case study on a timely topic. The study combines hydrological modelling of future scenarios with drought frequency analysis tied to a hydrologic-economic risk assessment for a very specific and certainly interesting case. The authors claim they aim to 'describe an academic exercise to manage drought financial planning...' (p.4). Similar to Reviewer-1 my main criticism of the manuscript also relates to the lack of clarity on the wider generalized contribution of the study. Despite the plural 'water utilities...' in the title and

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the phrased aim of an 'academic exercise', the manuscript reads mostly like a report on a case-specific study. As a reader I struggled to extract what was previously known and available and what is the main new contribution of the study and how the knowledge gained can inform further progress. I will provide some details below. In its current form, the pure case study descriptions is too long and the transferable part too small. In particular an extensive discussion and debate on assumptions, uncertainties and influences on applicability, which will make this useful to an international readership is missing. While I think the study has potential, I am afraid that with this balance of information given, unfortunately I cannot recommend publication in HESS.

The manuscript will also require a number of clarifications and improvements to structure. These may include:

- clarifying the actual academic objectives and/or hypotheses
- cutting and cleaning of a lot of unnecessary local and specific information that are not relevant or at least take attention away from the envisioned 'academic exercise' (such as e.g. lines 134-137, but many more also)
- a clear separation of a generic concise methods section from the prior assumptions and also from the specific results of this study. The description of study area and methods is nine pages, followed by only three and a half pages of results and conclusions. A discussion putting the results into the wider context is missing. This imbalance illustrates clearly that the commonly accepted structure of a science paper is not followed.
- In the current manuscript, most figures are already referred to in the methods section, which then contains already many details on results and is consequently rather confusing. To the reader it is unclear, which exactly are the new results reported here vs material available prior to this contribution.
- line 91 - why 'are affected' when referring to past droughts? Otherwise this is water scarcity and has perhaps not to do with drought as a temporary climate phenomenon.

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This is also something I struggled with - clear definitions would be very helpful to the reader.

- The threshold appear not close to usually employed drought thresholds which often represent the 10th or 20th percentile of the empirical distribution function of river flow or other hydrological flux or state variables. Where does this demand threshold rank in the flow duration curve? And can the deficit then really be termed drought. Some of the figures indicate a deficit every year. Commonly this may not be considered a drought (as an unual and rare event). A thorough discussion and explanation comparing to the literature is needed on this aspect.

- The WEAP modelling is presented as part of the study, but there is not enough information on model details to convince the reader of a carefully carried out modelling. It also lacks an assessment of uncertainty. In a climate change application the most important information is whether the signal of change exceeds that of current uncertainty. Some of the modelling description uses unusual terminology and phrasing. I suggest to have this proofread by a modelling expert.

Specific comments

75 - sentence makes no sense grammatically

156 - text unassigned to a header and structurally unclear

91 - what are 'establishments' ?

396-397 unnecessary

Table 1 - Those are not 'variables' - wrong terminology Table 2 - should it not be 30, 90 and 90,180? Table 3 - First two columns don't make sense in the table as they don't vary Tables 4-6 would be much nicer as graphs - this illustrate the point: absolute numbers don't matter to an international readership that will not be ingterested in the specific case, but in sensitivities, systematic differences, trends etc...

Figure 1 - are there numbers in the subwatersheds? resolution is insufficient - either show clearly or remove from map

Figure 2 - Why show the seasonality if what matters is the demand vs the deficit over the year?

Overall there many abbreviations that sometimes make reading difficult.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2017-615>, 2017.

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