**Hydrology and
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Discussions

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comment

Interactive comment on "Socio-Hydrologic
Modeling of the Dynamics of Cooperation in the
Transboundary Lancang-Mekong River" *by*
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Received and published: 28 November 2020

Reviewer #3:

Reviewer Comment: I found this to be an interesting paper on an important topic. I
have two major comments for consideration by the authors and editors.

Author Response: Thank the Referee #3 for the comments, which we believe will help
improve the manuscript substantially. We will respond to the comments in a point-by-
point manner as follow.

Reviewer Comment: 1. While I find the sentiment analysis an interesting and poten-

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tially valuable aspect of the paper, it seems problematic to review only English language media. It has limited the authors to the study of a single downstream country, which in its own right is troubling when the purpose of the study is to contribute to cooperation analysis in a diverse, multi-country transboundary basin. Additionally, English language media is, in its very nature, designed for consumption by outsiders and elites. This could yield biased sentiment relative to native language publications, which may be more indicative of populist sentiments and of the concerns and insecurities of the country.

Author Response: We admit that the sentiment analysis based on English newspaper could yield biases compared to local language media. Although English is not frequently used in the Mekong countries, the English media is accessible to international audience, and serves the international audience who are interested in the affairs of these countries. The English media is considered a reference to the government's foreign policy (Curtin, 2012). Therefore, the English news articles can somehow reflect national interests and political responses that riparian countries want to deliver to the international public (Wei et al., 2020) in spite of its possible bias. On the other hand, the sentiment analysis based on local language media is tough at this stage. Since the local languages are diverse and not international language, it is too difficult for us to read manually, while the sentiment analysis algorithm could only deal with English articles, automatic analysis also faces difficulty. Among the downstream three countries, Thailand published the largest number of English news articles on the dam constructions of upstream, which could offer us a consecutive data series with relatively low uncertainty due to limited data. The validation against sentiment analysis of Thailand English media is thus a reasonable and feasible method. We have to acknowledge that this is a kind of "look where the streetlight is" manner, while it still shed light on the results produced by the model. We will admit the shortage and biases of the method, and explain more the rationality at this stage in the revision. Thanks for the comment.

Reviewer Comment: 2. I appreciate that the authors have considered some examples

of specific drought events in their analysis, as it is an acknowledgement of the fact that cooperation can be most important for extreme events. However, I still worry that the approach presented here has a "look where the streetlight is" approach to assessing benefits and risks of cooperation vs. non-cooperation. For example, I see no consideration of uncertainty in the presentation of results, when in fact (as the authors acknowledge at times) there are deep uncertainties in many parameter estimates. For me this is clearest in the case of fisheries, where the potential for catastrophic impacts during extreme events or long-term ecological consequences of changing water conditions falls outside the range of any analysis that might be calibrated to the first few years of experience. Given the centrality of fishing in this basin, and the fact that it is one of the most contentious topic areas with respect to dam construction, I worry that an analysis like this one can understate the impact of dams and miss the low-probability, high-impact risks and benefits of changes in river management. It seems a problem more suited to robust decision making frameworks than to optimization. I don't insist that the authors completely change their framework for this manuscript. But at a minimum I would like to see: (1) acknowledgement of deep uncertainty and discussion of the implications of this uncertainty when interpreting results; (2) some form of sensitivity analysis that accounts for parameter uncertainty in the presentation of key results.

Author Response: Thank the reviewer for suggestions on the uncertainty problem. We admit that the structure of model and parameterization could cause uncertainty, including the fishery benefit calculations mentioned by the reviewer, which could face deep uncertainty because of the simplification. We will acknowledge this in the revision and discuss the uncertainty when interpreting results. For the sensitivity analysis, we have chosen several critical parameters to calculate their sensitivity index when conducting future scenario analysis. Results show that among the parameters, simulations are more sensitive to the prices of crop, fishery and hydropower, and irrigation efficiency coefficient, when compared to the parameters in the policy feedback module. In this case, we will conduct Monte Carlo test of the sensitive parameters to find out the un-

certainty of simulated cooperation level, cooperation demand, upstream/downstream benefits caused by parameterization, and add this part to the revision.

Reference: Curtin, M.: Chinese media and globalization, Chinese Journal of Communication, 5, 1-9, 2012. Wei, J., Wei, Y., et al. An Analysis of Conflict and Cooperation Dynamics over Water Events in the Lancang-Mekong River Basin, Hydrology and Earth System Sciences Discussion, 2020.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2020-388, 2020.