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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Norms and values in socio-hydrological models" *by* Mahendran Roobavannan et al.

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1) Reviewer Comment: This paper did a review of socio-hydrology (SH) modeling with a focus on several place based studies. Based on the review, the Authors pointed out the importance of social norms and values in SH models. At the end, the paper proposed potential future pathways of SH models and discussed the challenges to generalize SH models. I have the following comments that I hope the authors could address in the revision.

Authors response: We thank Xi Chen for his review. We will address all the specific comments below.

Specific comments:

2) Reviewer Comment: The paper explains the review case studies in multiple sessions with too much details. The focus of the paper should be the knowledge generated from those case studies. Maybe the authors can find a way to generalize the information provided by these studies.

Authors response: Thank you for your concern. We will follow your advice and add a conceptual figure, and a one paragraph synthesis along with it, towards the end of section 4 to generalize the information presented in the section. Please note however that section 4 itself was designed to be a synthesis.

3) Reviewer Comment: In section 2.2, maybe the authors should add the following reference, since this study is also using the idea of community sensitivity to do SH modeling. Chen, X., D. Wang, F. Tian, and M. Sivapalan (2016), From channelization to restoration: Socio hydrologic modeling with changing community preferences in the Kissimmee River Basin, Florida, Water Resour. Res., 52, doi:10.1002/2015WR018194.

Authors response: This was an oversight. We have now added the reference.

4) Reviewer Comment: Section 2.3: Roobavannan et al. (2017) is still in review, so it is hard to assess the review materials in this manuscript.

Authors response: Roobavannan et al. (2017) is now published and is accessible via http://www.doi.org/10.1002/2017WR020671. We have also updated the citation in the reference list.

5) Reviewer Comment: Line 288-294: The paper suggested that environment awareness and community sensitivity are both following the general logic of the VBN theory. So maybe the authors can unify the norm/value parameters to one and provide a clear definition based on the VBN theory.

Authors response: The purpose of community sensitivity and environmental awareness variable is to capture the society's changing value and norms and follow the principles

of VBN theory. It should be noted these variables include the value, beliefs and norms together. We will revise the paper to unify the relevant terms and use variables. We agree that we need to further differentiate the variables as we begin to reliably observe them.

6)Reviewer Comment: Line 448-453: van Emmerik et al. (2014) uses environment awareness, not community sensitivity.

Authors response: Thank you for correction. It is corrected.

7) Reviewer Comment: Line 511-513: For the three listed river basins, please add the countries they are located in.

Authors response: Country of respective river basins will be added.

8) Reviewer Comment: Line 521: Typo: “Elshafiei”. These three references have been repetitively mentioned in this manuscript over 10 times. I think the focus of the paper should be the scientific knowledge that can push SH modeling forward, not the three case studies.

Authors response: Typo is corrected. We agree with the reviewer that this section may give the impression that we are just repeating three different case studies. Our intention was really to connect them to VBN theory. We will do a better job in the revisions, and thus minimize the apparent repetitions.

Indeed, the focus of this section was to highlight the need to include changing values and norms of society in order to predict future projections. Through this review we explain that recent SH model studies have moved closer toward integration with key social science theories of perception and behavior, and have taken steps toward endogenizing values and norms. We intended to show that these models are internally consistent with patterns observed with proxy data of environmental awareness and water policy change, such as the newspaper article-based proxies of Wei et al. (2017). However, such proxy-reliant models are only the beginning of the way towards

generalized models and their use in predictions for sustainable water management.

9) Reviewer Comment: Figure 5: The paper spends a fair amount of paragraphs to talk about the parameter “community sensitivity”, but the analysis provided by the study is using “environment awareness”, which I believe is a different parameter. Following my previous comment, maybe the authors should add explanations about the differences between these two parameters and try to generalize the parameters, which would be a part of the SH generalization process.

Authors response: Community sensitivity and environmental awareness are variables defined to capture the changing values and norms in different socio-hydrological models. Community sensitivity is an advance over the previously defined environmental awareness. We agree that they are different in the way they are defined, yet both intend to capture the same concept of changing values and norms in corresponding socio-hydrological models. We however will add text on the difference between their definitions as the referee suggests, that community sensitivity is a more complex description of environment awareness. Both are modeled as memory variables. But while the time scale of the memory of past environmental disaster is kept constant in the case of latter, it is dynamic in the case of latter and depends on community norms in context of its water environment.

Please also note the supplement to this comment:
https://www.hydrol-earth-syst-sci-discuss.net/hess-2017-432/hess-2017-432-AC2-supplement.pdf

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