

Interactive comment on “Socio-hydrology from the bottom up: A template for agent-based modeling in irrigation systems” by Dimitrios Bouziotas and Maurits Ertzen

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Received and published: 11 June 2017

We appreciate the clear criticism and useful remarks on the clarity of our work. The reviewer starts by raising concerns on the paper focus, which we acknowledge and discuss about in the general comments, as well as remarks about the connection to the real Irrigation Management Game (IMG). We would like to point out that the relation between the existing real game setting and our model is twofold. First, the IMG serves as a realistic, yet artificial case reality to set the model. Second, our model players are compared with the human players in the original game – and the results of their actions as well. The ‘agent perspective’ is included in our model through the choices

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that agents can make – and indeed at the moment they make similar choices.

Regarding the expectancy of the results, we agree that most of the results are not terribly surprising, as we follow the original rules of the game – including allowing upstream farmers to take water first. We have not done so yet, but could easily implement a water distribution logic where downstream farmers can start first. We note, however, that this does not reflect the original rules of the game, which represents a simple gravity system without elaborate management policies, where upstream users have a clear advantage, as is the case for many real-world cases especially in the developing world. Moreover, we would like to note that not all the results are straightforward effects coming from the game rules. For instance, what is not directly modeled but appears in the results is the crop-per-drop ‘wisdom’ that downstream users develop during the game.

We believe that what is crucial for our current paper is how one can understand the model – and as such the IMG and, in turn, real world irrigation – as a small world in which agents relate to other agents and the environment through signals. Obviously, we have modeled how signals change from upstream to downstream, but we could have done otherwise. This brings us to the points we made regarding possible future works and analyses. We have some proposals how to strengthen these claims in our general comments.

We thank the reviewer for the minor suggestions for shortening and expanding elements in the text and will work on these. We have indeed referred to all agents as males, for no better reason that in the second author’s language all words that are not clearly female are to be addressed as being male. However, we see the bias in our reference of male agents, and will make changes to accommodate female agents as well.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2017-107, 2017.

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