

Interactive comment on “A framework for modelling the complexities of food and water security under globalisation” by Brian J. Dermody et al.

Anonymous Referee #2

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This is a timely paper presenting a framework for modelling the water-food nexus in a globalised world. The topic goes across disciplines and is relevant for the ESD journal.

GENERAL COMMENT

While the approach proposed here is scientifically interesting, the structure of the paper does not seem appropriate. Also, some statements are far too strong, e.g. “the approach unifies and extends the existing fields of hydrology, Integrated Assessment Modelling and agent-based modelling”. My general suggestion is to focus on the framework and its novel aspects, without making overstatements about it. I report below some specific comments that I hope can help improve the description of the proposed framework.

C1

SPECIFIC COMMENTS

1) The modelling framework, which is the core of this paper, comes abruptly after 10 pages of literature review. I propose to introduce it early on, provide more details about the framework (e.g. have you tried to build an actual model based on this?), while avoiding too much text for literature review (Chapter 2 and 3 are really too long).

2) Introduction: Is the text up to line 34 really needed? It is very basic, it reads like a textbook and it is not much related with the framework.

3) An entire section of sociohydrology (Section 3.2) seems a bit too much here, as the proposed framework is in fact an upgrade of IAM coupled with a biophysical model. In any case, while I agree that “sociohydrological studies so far have explained the observed emergent phenomena by allowing human agency...”, there are studies of this kind that were published before 2014. So, if reference to sociohydrology is really needed, previous efforts made by other scholars should not be ignored here. Also, if there is an entire section in Chapter 3 about sociohydrology, there should be at least an entire paragraph later on in the paper discussing the link between the proposed framework and sociohydrological research.

4) The paper states that “currently 30% of energy produced is used in food production, with fluctuations in energy costs having direct impacts on agriculture and thus water resources”. Yet, the interlink with energy production is then almost forgotten in the rest of the paper. I understand the focus on food, but the water-food-energy nexus cannot be completely neglected.

5) What do the authors exactly mean by resilience/resilient and sustainability/sustainable? These “buzzwords” are used a number of times, but in different contexts and, in my opinion, with a completely different meaning. I’m fine with any definition, as long as these terms are used consistently throughout the entire article. Still, I must confess that I feel a bit uncomfortable to figure out the exact meaning of statements like “the optimally resilient and sustainable solution”.

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6) Typos: “it challenging it challenging”, references with first name abbreviation, etc...

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