

## ***Interactive comment on “An assessment of domestic rice distribution for transboundary water-food management in Japan through virtual water trade” by Sang-Hyun Lee et al.***

### **Anonymous Referee #1**

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This article describes an economic model that simulates the regional flows of rice on the Japanese market for this commodity. Rice flows are translated into virtual water flows using the water footprint concept. I do not recommend publication of this article in HESS for the following 3 main reasons:

- 1.) The main focus of the paper is the national rice market of Japan and its regional re-distribution flows, which are modelled using an economic approach. The only relation to water/hydrology is the water footprint calculation. I believe that the topic falls outside the core area that HESS usually covers.
- 2.) The paper has an almost exclusive focus on the Japanese market. I am not clear

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about the value/impact of the paper for an international audience such as HESS's. The authors do not clearly expose what they see as the main contributions / generic insights that are applicable elsewhere.

3.) The authors do not clearly explain/expose what they see as methodological/technical innovation in their article. To my knowledge, neither the gravity model used to simulate rice flows nor the water footprint calculations are new contributions.

Apart from these main comments, I have a couple of technical concerns that should also be addressed, before this article can be considered for publication:

1.) The gravity model that is used to simulate regional rice flows in the Japanese market is not validated against any observational datasets. I strongly believe that the predictive skill of models has to be tested. This is a highly simplified approach and in order to establish confidence in the model results, validation is essential.

2.) It is unclear what the exact purpose of the water footprint calculations is apart from being able to show virtual water flows. The water footprint concept disregards the variability of water scarcity in space and time. The impact of abstracting virtual water from a water-scarce basin is larger than for a water-abundant basin. Impact is also more severe during periods of drought. The true water availability shadow price will be highly variable in space and time and this could be captured with a spatio-temporally resolved model of the Japanese water-food nexus.

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