

## Comment on hess-2021-521

Anonymous Referee #2

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Referee comment on "A system dynamic model to quantify the impacts of water resources allocation on water–energy–food–society (WEFS) nexus" by Yujie Zeng et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-521-RC2>, 2021

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This manuscript presents a new approach for modeling water-energy-food nexus by incorporating social feedback loops driven by environmental awareness and a water resources allocation model into the system. It's a interesting topic for researchers in the related areas, and the proposed approach has potential application value in other basins. The manuscript is clearly organized and the study background is described comprehensively in the Introduction. However, the method is not clearly explained in some places, and there are some detailed errors in words. Below are some detailed comments:

- The impact of water supply on energy consumption is related to industrial water, not ecological water or domestic water. Please clearly distinguish the impacts of different types of water supply on energy and food.
- In Figure 1, is the output of the water resources allocation model a total water supply or water supply of different sectors for every operational zone?
- In the energy system module, water supply not only affects energy consumption, but also energy supply, such as in thermal power, hydro-power and some other sectors. It is need to consider the impact of water supply on planning energy production.
- Please explain why GDP will affect the change of water quota in detail and provide some references for it.
- Line 197-202: There are several variables in the equation (6) that are not explained.
- For equation (9), why does the energy use quota of an optional zone multiplied by the water use quota of an optional zone equal total energy consumption? What is the definition of energy use quota in the paper? Please explain it.
- Line 238: the calculation formula of WSR isn't presented in the paper, please add it.
- Line 328-331: Please add references to illustrate the contradictions between the increasing demands and limited resource supply will be aggravated in the study area.
- Are the impact of policy on water supply taken into account in the water allocation model, such as total quantity control of water consumed in the region?
- Line 358: How long is the data used for parameter calibration? Please add it.
- The conclusion section is too long now, please make it conciser and highlight the key conclusions.

technical comments:

- Line 124-125: There is no need to use the serial numbers "(1), (2)..." here, please getting rid of them.
- Line 174: The sentence "...are the of population..." is lack of some words.
- Figure 1: "Municipal water demand" projected by population is lack of rule water demand, which needs to be added.
- The font size of Equation (3) is not consistent with other equation
- Figure 4(i) : The text after "phase 1: " is blank.
- Line 404: The word "phase" doesn't need an s.