

Interactive comment on “An assessment of global net irrigation water requirements from various water supply sources to sustain irrigation: rivers and reservoirs (1960–2000 and 2050)” by S. Yoshikawa et al.

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Dear HESS Editorial Board and Reviewers

We would like to submit Author Comments of our manuscript entitled "An assessment of global net irrigation water requirement from various water supply sources to sustain irrigation: rivers and reservoirs water (1960-2000 and 2050) [Doi:10.5194/hessd-10-1251-2013]" submitted to Hydrology and Earth System Sciences.

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First of all, we would like to express here our deep gratitude for the invaluable suggestions that are helpful for us to revise our manuscript. We apologize for some parts of our manuscript confused Referees.

All of your suggestion and comments are helpful and insightful for revising our manuscript. We are in the process of addressing all of the comments accordingly, revise and submit our manuscript. However, we realized that we need more time to revise our manuscript thoroughly including some additional simulation according to your suggestion. So, we are going to submit revised manuscript by 15th June, following consultation with our handling Editor.

We will submit a detailed one-by-one response to each of referee's comments together with our revised manuscript. These main comments from two referees could be summarized into four: (a) Structure and Readability, (b) Sufficient discussion, (c) Sensitivity experiments, and (d) Future projections.

Below, we demonstrate the direction of revising our manuscript:

(a) Structure and Readability:

We noticed that we used some misleading terms and lacked clear definition in our manuscript. In addition, particularly in Method Section, explanations for some process were lacking. We are going to modify our manuscript for more clear understanding without the above problems.

(b) Sufficient discussion:

As pointed out by Referee #1 and #2, the discussion part was insufficient about similarities or differences with previous studies. In the current form of manuscript, in some cases, discussion of our result, uncertainties and limitation of future simulation are lacking or at least insufficient. We are going to re-write such part thoroughly with including careful comparison of previous result with our results. Additionally, following Referee #2's suggestion, we are going to discuss key limitations of our future simulation, such

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as,

- We used only one irrigation scenario according to population growth.
- We assumed that the storage capacity of large- and medium-size reservoirs, as well as industrial and domestic water withdrawals, were unchanged between the years 2000 and 2050.

(c) Sensitivity experiments:

As pointed out by Referee #2, sensitivity analysis just using nearby years 1997 and 2000 is rather uncertain because of only three years difference. In this part, what we wanted to describe is different meaning to the above. As you can see Figure 4a, NNBW has increased substantially between 1997 and 2000. We confirmed whether this increase comes from only expansion of irrigation area or not. So, we showed how much contribute this increase from either difference of the irrigation area data or atmospheric forcing data, which is included year-by-year variation of natural climate system fluctuations, between 1997 and 2000 in Table 3. However, we used misleading terms ('climate condition' and 'climate') in this part. Thus, we are going to revise from these terms to "the difference of atmospheric forcing data between 1997 and 2000" in our revise manuscript. We will have no discussion about climate change over the entire past simulation period because the period (1960-2000) is too short to describe about climate change. However, we are going to discuss about this in the future projection as we describe in (d).

(d) Future projections:

In our manuscript, we reported future irrigation water requirement from new additional water sources using an irrigation area scenario. We stated that more irrigation water will be required from additional water sources according to irrigation area expansion (only) using an idealistic situation without considering climate change effect. However, Referee #1 recommend us to include some analyses on effects of climate change

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during the same period, and to contrast the contribution of changes in irrigated areas alone to the effects of climate change. We are going to add the future simulation of the effect of climate change alone in the year 2050. In this simulation, we will assume that irrigation area and the storage capacity of large- and medium-size reservoirs, as well as industrial and domestic water withdrawals, are unchanged between the years 2000 and 2050. According to only climate change effect, we will find how much amount of water will be required from additional water sources. As a consequence, we are going to append excursus to substantial portion of our manuscript including figures and tables.

We are going to revise our manuscript thoroughly according to the above direction. After this, we sincerely believe that newly version will be up to satisfying both referee's comments.

Again, our gratitude to you and all of Reviewers.

Sincerely yours

Sayaka YOSHIKAWA (On behalf of all authors)

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