

***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.***

**Anonymous Referee #2**

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I agree with most of the basic comments of anonymous referee #1 (Hydrol. Earth Syst. Sci. Discuss., 10, C347–C350, 2013 & www.hydrol-earth-syst-sci-discuss.net/10/C347/2013/), Therefore, I will just repeat the most important points (to stress them) and add more detail when additional topics are concerned.

My principal comments concern, in the order of sequence of occurrence, (1) readability, (2) sensitivity, (3) future projections of population, (4) GMIA.

(1) Referee #1 mentioned "As it stands, it is hard to grasp the main content and

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results of the results and analyses this paper is based on." I fully agree with this. After starting to read the paper, I got more and more confused during the text, and could not see anymore the "red line" that followed one or several goals. This seems to be often, besides the inconsistent wording, also the consequence of lengthy comparative descriptions of numbers which are in the tables, or figures, and sometimes text even repeats.

e.g. p 1255 l 11-13 "By investigating the model outputs year by year for the period 1960–2000, we obtained variations of the irrigation requirements from each of various sources due to both changes in irrigation practices and climate change" - "variations" suggests fluctuations - it is the temporal development / increase, isn't it? - Perhaps irrigation "practices" should be detailed explicitly to be "irrigation area extent" and "efficiency increases"? - Climate change is misleading/unclear in the context, because conditions 2050 mentioned elsewhere are then suggested to be fully without climate change??

(2) p 1262 l 15: I think, the sensitivity analysis just using nearby years 1997 and 2000 is rather uncertain because of only three years difference, which also may include strong year-to-year variations of climate not of climate change, but just from "natural/normal" climate system fluctuations. Also Table 3 (p 1279), first column is unclear (I supposed it to be climate in 1997 and 2000, column header displays variable shown NNBW), and the description in the text, too.

I strongly suggest to show and discuss also the limitations (only population number projection, no change in diet, no Global Climate Model, no increase in reservoir volume, no increase in efficiency, no other boundary conditions) and uncertainty of the future projection

(3) p 1261 l 6 "We used a population growth rate per country of 0.9%yr<sup>-1</sup> on a global scale." Why did you use global growth rate, which would just increase linearly over all countries? I think, country-by-country projections are available (also in gridded form

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from CIESIN) and should be used, especially as population growth is a major boundary condition. Or at least discuss thoroughly the uncertainty through this assumption.

(4) p 1277 Irrigation area Siebert et al. (2005) - Which version of the Global Map of Irrigation Areas (GMIA) did you use? (probably version 4.0.1) Then the year of the publication should be 2007.

Minor comments (in addition to those of referee# 1)

p 1263 l 13 should read NNBW2000 instead NNBW 2050

p 1272 l 15 reference Klein, G. K. should read Klein Goldewijk, K. and be respectively correctly cited in the text

p 1282 Fig. 1 & p 1283 Fig. 2 Population should be in 1000 millions or 1 billions; unit does not to be repeated in the labels Figure caption "difference in X between 1960 and 2000" better "increase between 1960 and 2000" or "Increase from 1960-2000" or "Difference for the years 2000 - 1961" p 1284 Fig. 3 mention in graphic itself correct name and location "Siebert and \_Doell\_ [or Döll]"

p 1283 Fig. 6: please add legend

Conclusion

Like referee #1, I also see the necessity that the paper needs a major revision concerning the story line (some ideas seem to exist; HESSD 10, C347–C350, 2013) and the presentation of the results (improved title, textual editing and re-structuring, improved figures)".

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 1251, 2013.