Dear Editor and Authors,

Major comments

With interest, I have read the manuscript by Kummu et al. They globally estimated blue/green water availability and water requirement to produce 3000 kcal per capita per day of food for 309 food production units. They analyzed the geographical distribution and the temporal variability of the blue/green water scarcity. They finally proposed some countermeasures for water scarce regions.
Although a number of reports on water and food have been published, integrated analyses on water and food are still lacking. The authors addressed this problem with a series of simple but effective numerical simulations in this study.
The findings of this study sometimes seem oversimplified and require readers' attention because the authors set a lot of assumptions. For example, the authors fixed population and agricultural technology at the year of 2000, but they have substantially grown in the study period. The authors also set the globally uniform numbers for daily caloric intake and the ratio of vegetable and animal caloric consumption, but in reality, there are substantial regional differences. Nonetheless I believe this study is important, because it would be a good starting point toward more sophisticated studies.
The manuscript is quite well structured and written. The tables and figures are excellently prepared, which are clear and informative. I don't have to comment much except some items shown below.

Minor comments

Page 6934, line 10, "*blue water scarcity (Wada et al., 2011; Hoekstra et al. 2012)*": Also Hanasaki et al. (2008) devised an indicator for average seasonal (and partly inter-annual) blue water scarcity.

Page 6935, line 17, "*Crop management is…*": Throughout the text, it is not clearly mentioned that the crop yield was estimated by LPJmL and the temporal variability in yield is a modeled product. This should be mentioned here.

Page 6935 line 25, "*crop water productivity (water consumption per unit of biomass produces)*": It should be clarified either the total biomass or the edible parts of crop is discussed here.

Page 6936, line 17, "*statistical weather generator*": Statistical weather generators generally produce precipitation independently from that of surrounding grid cells. This makes spatially and temporary (sub-monthly) uniform distribution in precipitation over the basins, hence, it might underestimate the intensive severe drought and flood. A short note should be added to this issue.

Page 6938, line 14, "*resulting GBW scarcity*": The term should be clearly defined in text. Does it mean if the GBW availability falls below the GBW requirements, the region is categorized as "GBW scarcity"? The gap between the availability and requirement would be tiny for some regions while huge for others. Are these significances of shortage distinguished?

Page 6940, line 16, "*on-farm management*": It would be helpful for readers if the authors specify what the key items are. Does it mainly indicate the difference in crop yield?

Page 6946, line 3, "*the model assumptions*": It should be discussed the uncertainty in crop yield simulation. As far as I know, it is still a big challenge to reproduce the historical inter-annual variability of crop yield with macro-scale crop growth models. It is even more challenging when the models cover multiple crops for small regions. Because the GBW requirement is quite sensitive to model estimated crop yield, the uncertainty should be discussed here.

References

Hanasaki, N., Kanae, S., Oki, T., Masuda, K., Motoya, K., Shirakawa, N., Shen, Y., and Tanaka, K.: An integrated model for the assessment of global water resources - Part 2: Applications and assessments, Hydrol. Earth Syst. Sci., 12, 1027-1037, 2008.