

Interactive comment on “Global scenarios of irrigation water use for bioenergy production: a systematic review” by Fabian Stenzel et al.

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We are grateful to Mr. King for providing this very detailed analysis with numerous suggestions and comments for improvement and restructuring, which we will consider as far as possible.

We acknowledge the limited treatment of geographic variation in water availability, bioenergy water use, and productivity in our approach and will try to incorporate the improvements to the analysis for the revised manuscript.

As Mr King notes, it absolutely was not our intent to advocate for unsustainable irrigation of bioenergy plantations and we very much appreciate his help to make sure this impression is removed from the manuscript. We will especially extend the Discussion

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with a view on synergistic, sustainable solutions to possibly minimize the water use for biomass plantations – also as an encouragement that future studies should consider such options more properly than in the studies available – and here reviewed – so far.

However, this review is centred around the possibility (supported by the literature), that future biomass plantations might be irrigated. We agree that this should not happen at the costs of ecosystems or human water demands, however it does not mean that it won't happen in a unsustainable way. Economic incentives such as a global carbon price (reversely applied also for negative emissions), increasing land demand due to population growth, and the partitioning of the available land between the food-producing agriculture and the biomass industry might influence it. This review demonstrates that the potentially large amount of withdrawals for bioenergy irrigation should already today be considered when thinking about BECCS deployment, which there is a lot of in ambitious climate mitigation scenarios (e.g. from the IPCC).

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