

## ***Interactive comment on “Globalization of agricultural pollution due to international trade” by C. O’Bannon et al.***

### **Anonymous Referee #2**

Received and published: 4 September 2013

This paper has important potential for improving our understanding of globalization of water pollution associated with international trade. It is well written and useful for broader audience. I only have some comments to be addressed:

#1. While your study covers very long period (1986-2010), you have used the grey water footprint (m<sup>3</sup>/ton) from Mekonnen and Hoekstra (2010a, b) which is an average value for the period 1996-2005. How did you account for the change over time in the water footprint (m<sup>3</sup>/ton) due to changes in crop yield and fertilizer application rate? You have not said anything about the adjustment you made to the average values (m<sup>3</sup>/ton) in your paper. Will your final analysis and conclusion change if there is a change over the years in the grey WF (m<sup>3</sup>/ton)?

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#2. Your grey virtual water trade estimate seems to be quite large (1200 billion m<sup>3</sup>/yr in 2010) compared to the one estimated by Hoekstra and Mekonnen (2012) (433 billion m<sup>3</sup>/yr average over the period 1996-2005). Since you have used the same water footprint intensities (m<sup>3</sup>/ton), what could be the reason for this large difference? Have you considered more products compared to Hoekstra and Mekonnen (2012) or could there be other reasons?

#3. Page 11229, line 23: You state that previous studies of grey WF are limited but have not indicated in what way. What was their limitation and how do you address them in your paper?

#4. Page 11230, line 4: The grey water footprint concept can be extended . . . . I am not sure if you can extend the grey WF concept by accounting for other pollutants. You will only improve its estimate. So please replace 'concept can be extended' by 'estimate can be improved'.

#5. Page 11230, line 6-7: You stated that one of the serious shortcomings of the grey WF concept is its failure to explicitly account for the environmental effect of flow alteration. Flow alteration is related more to the blue WF than the grey WF. Therefore, I find your statement very strange. Please rephrase it or convince me.

Minor comments:

# you missed one important recent study on virtual water trade which also includes trade in grey water by Hoekstra and Mekonnen 2012, PNAS.

# Page 11229, last line (line 27): replace 'off of' by 'only on'

Reference

Hoekstra, A.Y. and Mekonnen, M.M.: The water footprint of humanity, P. Natl. Acad. Sci. USA, 109(9): 3232–3237, 2012.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 11221, 2013.

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