

## ***Interactive comment on “Recent evolution of China’s virtual water trade: analysis of selected crops and considerations for policy” by J. Shi et al.***

**J. Shi et al.**

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The paper is overly repetitive in its background and setup and mimics many papers from the virtual water/water footprint field in this regard. Wider referencing of disciplines and studies away from this literature would strengthen the arguments considerably.

We have revised and re-organized the introduction part. We have removed the information that is not closely linked to our research questions and only kept the background leading to our research questions. In the last part, we have clearly stated the objectives of our study.

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The paper mentions green water only in passing and then fails to differentiate blue and green water throughout the paper. This has significant issues related to policy and management and exactly who will benefit from this information, what they will change and alter as a result. This needs to be highlighted with regard to comparisons to surface water, withdrawals etc, otherwise the paper cannot make relevant conclusions.

We realized the green/blue water discussion is beyond the scope of this study. In addition, the reviewers also suggest we should make the introduction more concise and remove the unnecessary parts. Hence, we have eliminated the part from the introduction.

The reference to using this information and virtual water information in general into policy debates is made early. However, the paper significantly underplays this issue and instead speaks in broad terms around the terms policy and management. Unfortunately too much of this literature fails at this hurdle and this paper needs to be specific about how this information would inform national planning, trade policy, allocation policy, land use practices etc in order to go to the next level.

We have largely revised the discussion section, especially 4.2. We mainly base the discussion on our findings. We realized it's not a synthetic paper to address general issues of China's water policy so we organized the discussions in a way that draws implications directly from our results into policy sphere.

Much of the methods section could be taken out and acronyms simplified. The results also have information not germane to the paper.

We agree with the reviewer and have further simplified and refined the method section. We have further reduced acronyms and removed unnecessary sentences. We have also used concise descriptive language instead of equations.

It is mentioned early in the abstract that China should reduce exports and increase imports. This is a big statement not really supported by the evidence in the paper. What

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is the desirability of this statement? What are the implications for importing countries? This statement much like 'links to policy', remain under-explored and should either be deleted or improved.

We agree with the reviewer and have removed this statement from abstract.

Minor points:

a) P 11614 Line 1 – change 'for' to 'over' Line 24 – 'food security' and 'water management' are not defined. Suggest refining these terms in ways that reflect the results and leave the reader with greater insights and not just broad statements.

We have changed "for" into "over" and have revised accordingly. In the revised discussion section, we have explicitly discussed the meaning of 'food security' – to secure the food supply chain. In the context of traditional thinking, it refers to a high level of self-sufficiency of grain crops (95%), but we doubt both the economic and environmental feasibility of maintaining such a high rate as the dramatic increasing import of grain crops. In a broader perspective, we suggest achieving 'food security' in strengthening market power in the international food market via diversifying import partners. Also, here we have approached 'water management' from the perspective of virtual water trade. The aim of the paper is not to have a thorough discussion of integrated water management strategy. We hope to offer a deeper insight into China's staple crop virtual water trade and draw policy implications directly from our findings. We have revised the discussion section to closely link the discussion to the results and tried our best not to slip into vague and broad statements.

b) P 11615 Line 25 – change 'effluence' to 'affluence' Line 27 – 'Recent studies' – studies on green water and comparison with blue should not be referred to as 'recent'. This is a well established body of work and is not drawn from. Indeed there are no references here at all.

We have changed "effluence" into "affluence". We realized green/blue water discussion

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is beyond the scope of this research and have eliminated the part in introduction.

c) P 11616 Line 6 – '94%' is a very large number and begs the need for this analysis to explore this further – in comparative analytics and in terms of policy/management significance. Explore what this means in terms of scarcity issues that are raised throughout the paper. Line 26 – China is described as a water poor country. That refers to blue water I presume? Is northern stress related to blue or green or both – what is the significance of this statement considering this is a national average?

We realized the green/blue water discussion is beyond the scope of this study. In addition, the reviewers also suggest we should make the introduction more concise and remove the unnecessary parts. Hence, we have eliminated the part from the introduction.

d) P 11618 Line 5 – it's worth reflecting as to whether the paper achieves these aims. Some aspects are achieved; some such as policy significance are not.

We have largely revised the discussion section, especially 4.2. We mainly base the discussion on our findings. We realized it's not a synthetic paper to address general issues of China's water policy so we organized the discussions in a way that draws implications directly from our results into policy sphere. We don't think we have mentioned "policy significance" in the manuscript and our aim is to draw corresponding policy implication directly from our findings.

e) P 11626 Line 5 – from here and through this section – the debate confuses the reader. We hear about crop efficiencies and water withdrawals – pertaining to surface and ground water. Where is the import/export discussion around green water? What percentage actually can be managed and which cannot? Also referring back to P 11624 – this (soybean) is predominantly a rain fed crop. Without comparing the opportunity costs of water, a lot of this analysis becomes muddled in the numbers and is unclear about what can or should be done.

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f) P 11627 4.2 is under worked – should be longer, more connected to the results and stronger in its arguments. Too much of this section refers to wider policy shifts or responses taken by government. This is somewhat irrelevant to the argument. Specifically, what ministries, policy-makers would benefit from the information here? Are they water managers (principally interested in allocation and not green water), trade policy (where comparative advantages and higher value water and goods matter), national planning (where wider societal water needs need to be reconciled with increased water burdens and river health) etc. Break down what you mean by policy significance and then identify who and why. Without this the paper remains unfulfilled in its objectives.

We have largely revised the discussion section, especially 4.2. We mainly base the discussion on our findings. We realized it's not a synthetic paper to address general issues of China's water policy so we organized the discussions in a way that draws implications directly from our results into policy sphere.

g) P 11629 4.3 – eliminate this section and use the space to explore the points above.

We agree with the reviewer and have eliminated this section.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/10/C6742/2013/hessd-10-C6742-2013-supplement.pdf>

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