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Interactive comment on "Analysis of the characteristics of global virtual water trade network using degree and eigenvector centrality, with a focus on food and feed crops" *by* S.-H. Lee et al.

Anonymous Referee #2

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This paper presents an interesting network analysis of global virtual water trade on food crops and feed crops. However it is not clear why it is important to focus on food crops and feed crops, when some other papers (e.g. Konar et al. (2011), Konar et al. (2012)) have already discussed the network characteristics of global virtual water trade on total crops and specific crop types. Also, it is not clear how the results are comparing to previous papers. More discussion is needed.

Major comments:

1. In introduction, the author provides a good review on previously literature. However

it is not clear how this paper builds on this rich literature. In particular, how does this paper contribute to the literature? What's the novelty of the paper? Why it is vital to look at food crops and feed crops?

2. In discussion part, more deep analysis comparing your results with other papers is needed. Are the results similar as those in previous papers? Are there some papers to support your conclusions? Are there some unique features in network of food crops and feed crops, when comparing to that of total crops? Why they are different?

For example, P5 L12-19 discusses GVWTs by crops, which have been calculated in Table 3 in Konar et al. (2011). It might not be helpful to replicate previous works.

Minor comments:

1. Please define "food crops" and "feed crops". What specific crop types do they cover?

2. Section 2: Please add one subsection about data source, and provide more details. For example, what is the unit of the data? What commodities the trade data provide?

3. P5 L9-11: This make no sense. When calculating virtual water trade (VWT), we multiply CT by WFP (i.e. Equation (2) in P3 L20). Take the log, and we get log(VWT) = log(CT) + log(WFP) In Figure 1, the slope between log(VWT) and log(CT) should be 1. The only reason for the diffusion is log(WFP), which is dependent on climate features in exporting country. The diffusion in Figure 1(b) is larger than that in Figure 1(a). That is because the variance of WFP for blue water is larger than that for green water.

4. Fig 2: It seems that a subset of countries and links is plotted. Please clarify how you select those countries and links.

5. P6 L33: Please clarify how the volume and connectivity are classified into three groups. In particular, what is the threshold? Why the threshold is as it is?

6. P7 L15-22: Discussion about water savings is irrelevant to this part, which focuses on vulnerability. Please take it out.

Reference:

Konar, M. , C. Dalin, S. Suweis, N. Hanasaki, A. Rinaldo and I. Rodriguez-Iturbe (2011), Water for food: The global virtual water trade network, Water Resources Research, Vol 47, Issue 5, W05520, doi: 10.1029/2010WR010307.

Konar, M. , C. Dalin, N. Hanasaki, A. Rinaldo and I. Rodriguez-Iturbe (2012), Temporal dynamics of blue and green virtual water trade networks, Water Resources Research, Vol 48, Issue 7, W07509, doi: 10.1029/2012WR011959.

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Discussion paper