

Interactive comment on “Analyses of impacts of China’s international trade on its water resources and uses” by Z. Y. Zhang et al.

Anonymous Referee #3

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This study represents a contextualization of water usage in economic development terms. The authors draw interesting parallels between virtual water export and economic growth. However, they also make a number of seemingly unfounded conjectures regarding the connection between virtual water export and domestic water quality. This connection between virtual water exportation and water pollution, an admittedly very pertinent discussion, falls outside the scope of this research. Including these statements, and the additional claim regarding petroleum at the end of Section 3.1, simply feels too much like a political statement without concurrent scientific basis. While I may see the sensibility in the argument, inclusion of either corresponding data for analysis or citation to previous studies is needed. In general, grammar and typo issues affect my perceived flow of the writing. For example, line one on the second page begins

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with "There is a large [?] literature on the..." I also did not feel comfortable with the authors' choice to define DWUC and TWUC in a section heading, instead of in the text body. Similar typos, uncomfortable nuances, and slight grammatical problems exist throughout the paper. I recommend addressing these to ensure the utmost clarity for readers. The Data Section, 2.1, discusses which water sources are considered in the study. I find the justification for these choices to be confusing. My understanding is that the authors did consider water use, blue water, and water resources utilization. They did not consider water consumption, green water, and return flow. The explanation for disregarding green water pointed out an agriculture sector bias in green water usage. This argument makes sense in terms of simplifying the input/output model system. However, I would imagine eliminating green water usage inherently biases agricultural virtual water content toward water sparse regions. Furthermore, statistics regarding return flow and green water are needed to justify the water balance-related claims in Section 4.2. I found myself wondering how scalable these "provinces" were in terms of the country. The map in Figure 5 appears to indicate that the study encapsulated the entire country. The explanations of each "province" as political regions ranging from provinces to municipalities did not convey the same sense of continuity. I may be missing the explanation somewhere in the text, but my inability to fully understand how these "provinces" scale to the entire country suggests the need for a more thorough explanation than the existing sentences at the beginning of Section 2.1. My last concern is the analysis of water usage during manufacture of goods. I do not recall seeing an explanation of how the authors determined which goods are being either exported internationally or within the country. I would like to know how much virtual water movement occurs between provinces within China proper. For example: what percentage of the agricultural net virtual water import for Beijing comes from another province? Essentially this returns to my question regarding the true scalability of data collected from various political regions within a single country. The data may be perfectly scalable to estimate total virtual water exports from China, however, I do not see this concept fully explained within the report.

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