

## ***Interactive comment on “***

# **Analysis of intra-country virtual water trade strategy to alleviate water scarcity in Iran” by M. Faramarzi et al.**

**Anonymous Referee #2**

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### General comment:

This paper addresses very relevant questions about water for food production patterns within a country, in relation to water availability and water productivity differences. It uses an economic optimization approach to test potentials for different well defined strategies for increasing production within provinces and the whole country. The paper

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is systematic and well structured. However it's scientifically clear focus on specific strategies at the same time renders it less useful for policy support in water planning (which the paper claims to provide). Such support needs to look more broadly at all available water management options.

### Specific comments:

Explain, why water scarcity is a problem in Iran, when per capita water availability stands at 2000 m<sup>3</sup> – is it because of mismatch of water and population distribution or is it the seasonality of water availability (which shouldn't be so critical, if groundwater serves as major storage)

“Intra-country virtual water trade. . . would be a promising strategy” (page 2625)

Why doesn't it happen at the moment? Is it because real water costs are not reflected in the product prices, or is there no market for traded products or no transport infrastructure for that?

The study only looks retrospectively at the degree to which food self sufficiency could have been reached or exceeded in the past. Much more important seems to be the potential to meet future food demands also under climate, population and diet changes.

Please give at least some semi-quantitative outlook by using population and possibly also climate scenarios (that you mention on page 2621)

Only individual options are tested per scenario, no combination. What happens if you combine e.g. S2 and S5? Could you always meet self sufficiency requirements?

Other water management options (e.g. wastewater reuse or “exploitation of new water resources” which is mentioned in the text, or yield/CWP increases by breeding or food storage) are not mentioned. If you wish to claim to provide IWRM policy advice or a “sustainable strategy”, you would need to test portfolios of measures.

“Iran is unlikely to meet its national food objectives by merely implementing measures

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concerning improving field level management” (page 2614) – however, figure 3 shows that S5 is almost always above self sufficiency level. Explain.

“agricultural areas. . . can not be expanded” (page 2618) – is that also true if irrigation structures are expanded? Or is part of the spatial limitation a water – limitation. If so, please explore the land expansion option at least qualitatively in the text.

Similarly, please provide an estimate for the potential to increase rainfed food production by bringing yields to levels of other countries (e.g. as achieved in parts of China) and put that in relation to your blue water scenarios (how much could irrigated production decrease if green water management was improved).

What is the difference between: interprovincial, inter-regional and intra-country virtual water trade. If they are the same you should decide for one term only.

You announce to explicitly consider “social, economic and environmental constraints in determining optimal ASCP . . . outside of the LP procedure by assessing the LP results against. . .”, but you don’t. Again, you’re not addressing a “sustainable national strategy” (page 2616), but only specific individual water-exploitation and water productivity related aspects. Please rephrase.

While this is not the focus of the paper, you should also discuss briefly the self-sufficiency goal of Iran – at what price does that come for the country, e.g. in terms of costs for local production vs international market prices.

#### Technical comments

Explain what you mean by “trade sanctions imposed on importing countries” (page 2612)

Explain what you mean by “point of no return” (page 2615)

“Iran will purchase. . . in 2009” (page 2615) – please update

Unless you have any evidence for that “large CWP could also be achieved with small y”

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(page 2617), I would delete that statement. Normally CWP is closely related to yields.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 2609, 2010.

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