

Interactive comment on “Risk of water scarcity and water policy implications for crop production in the Ebro Basin in Spain” by S. Quiroga et al.

Anonymous Referee #2

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GENERAL REMARKS ON THE PAPER:

“RISK OF WATER SCARCITY AND WATER POLICY IMPLICATIONS FOR CO-PRODUCTION IN THE EBRO BASIN IN SPAIN”.

General comments

The paper touches an interesting topic from a scientific and practical point of view. Water scarcity has been and will be again an important limitation in the management and planning of activities and land uses in Southern Europe and because of that the paper deserves serious consideration.

However the various quantitative statements included in the paper would benefit if ac-

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panied by an estimate of the uncertainties or error levels. That is quite essential in the process of decision making and also to evaluate the reliability of the predictions. Likewise the implications for policy making of the obtained conclusions should be further discussed.

The climate scenarios, although only touched briefly in the paper, should be better presented and discussed, since the time schedule for management and planning is of the order of decades, and for those periods climatic variability should be explicitly included. Considering the inherent variability in such predictions and also the differences between different sets of scenarios, it is quite relevant to discuss more in depth the selection of such scenarios and the reasons behind that.

Finally the presented “functions” e.g. for crop yield, should be discussed in the frame of the time scale associated. In other words those functions are valid for a certain time interval and also for a certain range of variables. That point, quite important when making predictions at decadal scales, should also be introduced in the discussion.

Finally the selection of scales e.g. the logarithmic one, also used for other geophysical variables and analyses (see e.g. references Egozcue et al, 2006; Sánchez-Arcilla et al, 2008), should be also discussed.

Specific comments

1. When presenting the temperature differences in the Ebro basin mention is made of the cities of Burgos and Tarragona. They should be located geographically for the geographically non expert reader.
2. When selecting eight crops it would be important to discuss the reason of that selection and also why different types of crop have been preferred to others.
3. When presenting the Montecarlo method (paragraph 25, section 2.1.) it should be explained that it is not a technique to characterize statistically but rather a simulation technique from which statistical distributions and characterizations can be derived.

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4. When selecting data from the Spanish Meteorological Agency (paragraph 15, section 2.2.) they should be presented with more detail, distinguishing between the scales of meteorology and climatology.

5. When discussing a yield production or loss (e.g. in table 8, paragraph 5 of page 5910) the range of values, going from 1% to more than 15%, should be discussed and that uncertainty compared to the uncertainty in the various variables and parameters appearing in the yield function.

6. A number of concepts and initials through out the paper should be also better explained, to enhance the impact on various communities such as e.g. "OLS" (paragraph 15, page 5902) or "heteroscedasticity" (paragraph 15, page 5902).

7. The paper would also benefit from an in depth correction of the English by a native speaker, since there are slight deficiencies which, although not preventing a proper understanding of the text, some times make it a bit difficult. For instance in paragraph 25, page 5900, the sentence "statistical models of yield response have been proven...". I would delete "have been proven" and I would say instead "proved to be". In paragraph 25, page 5905, the sentence "this represents a partial increases of 202051 Hectareas..." I would delete the "a".

References

- Egozcue, J.J., Pawlowsky-Glahn, V., Ortego, M.I., Tolosana-Delgado, R. (2006). "The Effect of Scale in Daily Precipitation Hazard Assessment". *Natural Hazards and Earth System Sciences* 6, 459-470.

- Sánchez-Arcilla, A., Gómez Aguar, J., Egozcue, J.J., Orgtego, M.I., Galiatsatou, P., Prinos, P. (2008). "Extremes from scarce data: the role of Bayesian and scaling techniques in reducing uncertainty". *Journal of Hydraulic Research*, Vol. 46, Extra Issue 2, pp. 224-234.

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