

Interactive comment on “Dryland ecohydrology and climate change: critical issues and technical advances” by L. Wang et al.

Anonymous Referee #2

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General comments:

The paper well addressed the current critical issues in the understanding of dryland systems, and reviewed the technical advances also. In my opinion, It is an excellent research progress review, and I recommend the manuscript should be published after minor revisions. The suggestions are as follows.

Firstly, scale effects and scaling may be one of the important issues for "Dryland ecohydrology and climate change". In the part of "INTRODUCTION", the paper gives some sentences on scale (Page 4780, Line 17; Page 4781, Line 1); and the authors also has carried some research on upscaling (Page 4781, line 4-7). While, there are few

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sentences on scale effects and scaling in the manuscript. It is necessary for the paper to discuss scale effects and scaling methods for dryland ecohydrology and climate change.

Secondly, in the parts of "2.1 Dryland population growth and water demands" and "2.2 Dryland agriculture and climate change", the paper discussed the relationships between population and water demands, agriculture and climate change". The two parts are different from each other in general; while, it seems there are some close relationships between them. With the population growth, agriculture will have to support additional people, and more freshwater resources are needs. I am not sure the two parts can distinguish from each other clearly. For example, the contents (Page 4784, line 6-11) may be suitable for "2.1 Dryland population growth and water demands" also.

There are some specific comments also.

1. Page 4783, line 7-9. China and India have so many people and low economic levels(per person); it is impossible for the per-capita water footprint of China and India will reach the levels of the US. It may be difficult to turn the hypothesis into reality.

2. Page 4783, line 4-5. The population of China and India in 2050 should be updated. See "State of World Population 2010" for the new predicted populations please. So do with Fig.1.

3. Page 4788. In the part of " 2.4 Desertification and human vs. climate induced desertification", the authors discussed the driving factors of desertification. Maybe, some detailed data or examples, on the extent to which a region's degradation is caused by climate variations or human activities, can be given.

4. Page 4789. In the part of "2.5 Ecohydrological consequences of shrub encroachment", the effects of shrub encroachment are discussed at plot scale and regional

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scale. In the revised manuscript, the scale effects or scaling may be discussed further.

5. Page 4794. In the part of "3 Technical advances addressing dryland issues", the detailed technical advances on dryland systems are discussed. In the revised manuscript, the perspectives may be added.

6. Page 4798. Different remote sensing techniques are discussed for ecohydrological investigations. If the authors give a table and list different techniques for different ecohydrological applications, it will be better.

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