

Interactive comment on “Season-Ahead Forecasting of Water Storage and Irrigation Requirements – An Application to the Southwest Monsoon in India” by Arun Ravindranath et al.

V. Mishra (Referee)

vmishra@iitgn.ac.in

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The manuscript presents a framework for the season ahead forecasting for water requirements in India using cumulative deficit index. The manuscript raises an important topic, however, has a few relevant but unanswered questions. The major comments are as following:

1) Authors use the coarse resolution (1 deg) precipitation data for the period of 1901-2004 while high-resolution data can be more appropriate for this study. High-resolution and updated precipitation data are available at 0.25 deg for the 1901-2015 period (Pai et al. 2014). Moreover, air temperature data have been obtained from NCAR. Pre-

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precipitation and temperature during the monsoon season have co-variability. Therefore, authors should use both precipitation and temperature data from India Meteorology Department (IMD).

2) It is not clear to me that why the forecast was done only for 2001-2013 period? To ensure the robustness of the forecast, retrospective evaluation for a long-period (at least 30-years) is required.

3) Crop water stress has been estimated using cumulative deficit index (CDI). CDI is the difference between rainfall and crop water requirement (based on PET). This raises a major concern as CDI completely ignores the role of soil moisture persistence. If I am not mistaken, this issue has to be addressed in the revised manuscript.

4) How does CDI account for pre-season soil moisture?

5) If possible, authors should test the validity of CDI using soil moisture data. Authors may use soil moisture available from global land data assimilation system (GLDAS).

6) It is not clear to me that why did authors select the potato crop and not rice and wheat? For their analysis. The approach should be evaluated for other crops and the other regions as well.

7) The estimation of daily reference crop ET estimation is based on only maximum and minimum temperature and does not include radiation and wind. Therefore, uncertainty in ET estimation should be evaluated.

Minor comments:

1) The organization of the manuscript should be improved. There are many long paragraphs that should be shortened.

2) Lines 122-129 should be removed.

3) Lines 146– correlation values should be in two digits after the decimal.

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4) Lines 133-178: long paragraph

5) Line 195: CDI will mostly overestimate the demand as it does not consider soil moisture persistence?

6) Line 208: What is the basis of effective rainfall with $\alpha = 0.7$?

7) Quality of figures can be improved.

Vimal Mishra

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