

Interactive comment on “Water Food Energy Nexus: Changing Scenarios in India during recent Decades” by Beas Barik et al.

Anonymous Referee #2

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Review

A. The choice of the Topic:

(i) the authors have tried to link the food-energy security with groundwater availability based on past data over Indian region. The study area is really important and it is important bring out/highlight the link in presence of climate stress. Having said so, it is quite disappointing the manner the topic is described. Authors can't clarify the relevance of the metric used for validation of the results. For example the computation of ground water from GRACE satellite data is really not convincing as the results barely correlate with the directly measured groundwater data Fig.3(c,e,g).

(ii) topic wise, the manuscript is an intermediate between a policy report and scientific hypothesis (e.g calculation of Groundwater from GRACE vs comparing the growth of

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agriculture in recent decade). I believe the scientific rigorousness of the presentation is missing (and is compromised while writing). HESS mostly is a scientific reporting journal and not a policy reporting journal, hence manuscript is not suitable for publication in this journal or else require a thorough revision. The revision may be focused on explaining a particular science topic (e.g. evaluation of GRACE derived GW data with other observation)

B. Presentation

(iii) The manuscript is very poorly written and it lacks of focus, especially in the introduction where the so called food-energy nexus is introduced. The whole introduction requires a complete restructuring in order to have a clear focus.

(iv) The term "Water-Food-Energy Nexus" is really not a suitable or scientific term to use; especially "nexus" is term quite confusing as the word implies a causative connection which is not reflected here. The study at best hypothesizes a chain of unconnected events linked together. For example, from Fig.1, the "increase in food price" is not always directly linked to "food security". Similarly "pumping of ground water" is not always linked to "irrigation". The whole chain in fig.1 is very qualitative.

C. Results and DATA

(v) estimation of ground water based on Grace and GLDASS model result is not convincing as it includes many uncertainties (which authors themselves has agreed). There is no effort made by the authors to quantify the uncertainties.

(vi) A lot of trends has been plotted. Firstly "<http://eands.dacnet.nic.in/PDF/Pocket-Book2014.pdf>" is not accessible online on 2/2/2017 when I have reviewed the manuscript. Even if it is available I am not quite sure how such a data can be trusted for scientific studies. It could be good for policy "outlooks" only but unless some peer reviewed publications are available some of the results are not acceptable. For example refer Fig.6c. How do you think that there is any causal relationship between total

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food production and electricity consumption? How Electricity consumption is separated from agricultural use vs. other rural use e.g. commercial agro based industries (sans requirement of irrigation) use?.

(vii) Just providing correlation and trends does not show some causative evidence (may be it is useful for social references)

(ix) Fig.4(b) and (d) is a statement of unreliability of the GRACE data in correlating with AIMR for the link you are trying to establish.

F. Conclusion

Like introduction, the section on conclusion also has no new scientific result. Even no new policy decision support system has been suggested (those which are suggested are already in place).

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