

"Long-term groundwater recharge rates across India by in situ measurements", by Soumendra N. Bhanja, Abhijit Mukherjee, Rangarajan Ramaswamy, Bridget R. Scanlon, Pragnaditya Malakar, Shubha Verma

General Comment from Authors and highlights of revision:

Following the suggestion of the Reviewers, we have done a complete revision of the manuscript. We have diligently tried to respond to all of the reviewer concerns in the previous version of the manuscript, the responses are stated below. We believe, the manuscript have improved to a great respect.

In summary, we have:

1. Inserted a new hydrogeology map, Figure 3
2. Included more discussions based on the reviewers' suggestions
3. Modified several figures based on the reviewers' concern

Prof. Ghulam Jeelani's comments:

Very interesting paper about the recharge rates in India, but I have some suggestions:

Reply: We would like to thank Prof. Jeelani for his encouraging comments.

SC 1. Comment 1: The manuscript gives comprehensive recharge estimates as a function of climate, hydrogeology, irrigation, and precipitation, but the recharge rates as a function of lithology (particularly carbonates) and slope/altitude is lacking. We know that snow and glacier melt in Himalayan river system provide consistent recharge in higher altitudes.

Reply: Carbonate aquifers are mostly confined within the Indian state Jammu and Kashmir, the region is kept outside the study region because of limited data availability. We would consider these in future studies.

SC 1. Comment 2: Are these recharge rates applicable to shallow unconfined aquifers only?

Reply: We agree with Prof. Jeelani, these recharge rates are computed for shallow unconfined aquifers only. We don't have enough data availability for computing recharge rates in different types of aquifers.