

Interactive comment on “Natural vs. artificial groundwater recharge, quantification through inverse modeling” by H. Hashemi et al.

Anonymous Referee #2

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Authors have done a useful study for a site located in Iran. The study provides an insight into the relative contribution of ephemeral stream and artificial recharge basins. The work has practical significance as it may eventually lead to better management of river waters to augment ground water recharge. For any complex system, authors have to make certain assumptions in order to apply a model and authors have done that judiciously. However, there are certain points which need to be addressed by the authors so that the results presented by them can be better appreciated by readers.

1. Has the river network been stable with time? Fig. 2 shows the branching of Bishehzard stream and confluence of this with Tchah-Qootch river. Did authors notice any shifting of the confluence or branching points and ephemeral streams during the study

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period? This may be a useful information as any change in river course might influence the ground water levels in the observation wells. 2. Some details as to how the average ground water contour map was developed will be useful. 3. Fig. 7: Why to show average of ground water levels of all observation wells. What about the agreement diagram for each observation well. At least, authors can show results in a table. This is essential to capture the relative contribution of artificial recharge from basins as well as ephemeral streams. Authors should present the analysis of different observation wells and reconfirm their conclusions regarding relative contributions of artificial recharge basins vis a vis ephemeral stream. 4. Fig. 8 shows that estimated recharge for AR1 and AR2 is very close to zero. For ER (Ephemeral river), recharge seems to be very high in few cases. Can we conclude from this Figure about the relative contribution of recharge from artificial basins and ephemeral streams. If yes, what will be the associated confidence interval for such estimates. 5. Fig. 9: It will be useful to mention somewhere in the text what are these ground water flow periods P1-P10. 6. Fig. 10 shows that in year 2001, recharge volume is almost close to zero whereas between 2006-07, there is associated recharge volume. In both the cases, the amount of precipitation, however, appears to be same. Can authors elaborate on it.

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