

Interactive comment on “Contribution of the Sensitivity Analysis in Groundwater Vulnerability Assessing Using the DRASTIC and Composite DRASTIC Indexes” by Mohammad Malakootian and Majid Nozari

Anonymous Referee #2

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Review for Nat. Hazards Earth Syst. Sci. Discuss. Article number: nhess-2019-181 Title: Contribution of the Sensitivity Analysis in Groundwater Vulnerability Assessing Using the DRASTIC and Composite DRASTIC Indexes Authors: Mohammad Malakootian and Majid Nozari

Summary

In this manuscript, the authors present a characterization of groundwater vulnerability of an Iranian aquifer. The authors apply the DRASTIC and CDRASTIC methods to

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construct the vulnerability map and subsequently perform a sensitivity test to identify the most influential factors. Overall, the manuscript is poorly written. I have a hard time to understand what the authors are trying to express. In some cases, even the definition of hydrogeology terms, e.g., groundwater vulnerability, is not clear at all. The methods used and the results derived from the work are not new. The results may be useful for the groundwater management in the study area. However, it is difficult to identify any general contribution to the field. Although the authors have corrected the manuscript following the comments from a reviewer, I think the manuscript still need some significant revisions before it may be published.

Major comments

1. The title should be modified. In fact, this is only a case study not a general evaluation of existing methods or a sensitivity test approach. To me, what the authors did is a characterization of a specific Iranian aquifer. This should be made clear in the title, rather than to generalize the results. In any case, the authors should not claim their study may quantify the contribution of ‘sensitivity analysis’ in groundwater vulnerability assessment. This is too broad but not what the authors actually achieved.
2. The authors should highlight their contributions in Abstract and Conclusion sections. Again, the contributions should be specific, not generally saying the sensitivity test is useful.
3. Introduction. This part should be modified further. Apart from the English, the literature review on DRASTIC should be developed further. In the present manuscript, the authors only listed a few studies that apply the methods. They did not discuss the significance or the limitations of the approach. Also, the purpose of the research is introduced in a not very convincing way. Why the droughts and pumpings make the studies on pathology and groundwater contamination undeniable?
4. Methodology. The authors mixed the presentation of methods and data. This section should be called Methods and Materials (or Datasets). The authors should give support

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for the selected values for each parameter listed in all the Tables. How do you assign weights to each factor? Based on which data or information? Are these subjectively assigned or you have references?

5. Is it really useful to separate the components and discuss about their general functions? Consider to merge sections 2.3 to 2.10. These small sections make the presentation fragmented.

6. Conclusions. Here the authors mentioned agricultural and industrial activities. However, these are not discussed in the main body of the Results section. How do you support your conclusion? I suggest the authors to make specific conclusions that are directly derived from study. To discuss about general concept based on this single characterization case study and sensitivity test makes no sense.

Detailed comments

I marked a number of comments on English usage directly on the PDF file while I went through the manuscript (see the attached supplement file). I used the PDF file after the author's correction based on the comments from Reviewer #1. I want to point out that my corrections are not exhaustive. The authors should ask a native speaker to help to improve the English. Otherwise, it is too hard to comprehend the study as it is.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-181/nhess-2019-181-RC2-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2019-181>, 2019.