

Review of se-2014-95: Characterization and interaction of driving factors in karst rocky desertification: a case study from Changshun, China.

General comments:

This study evaluates the influence of driving factors on the evolution of karst rocky desertification using geographic information techniques and models. The manuscript presents a significant original contribution to the assessment of the relative impact of anthropic and natural factors on these processes.

The manuscript represents a substantial contribution to this field, the techniques used are novel and useful and the design appears robust. However, in my opinion the methods are not thoroughly explained and some interpretations, statements and conclusions are not fully supported by the results. I therefore recommend to reconsider the manuscript after major revision.

Specific comments:

1. Some conclusions and statements are not supported by the results or are contradictory. For instance, according to the abstract and the discussion “there is no significant difference between the impacts of natural and anthropogenic factors” (Page 2940 Line 16-17; P 2952 L 20-23). However, according to the results and the conclusions, “natural factors have higher impact on KRD deterioration” (P2954 L23). Please clarify those points.
2. P2945 L5: In order to widen the applicability of the suggested method could you provide the soil taxonomy used to classify the soils.
3. Please clarify that the information on human activity farming (hilly lands, overgrazing, felling and restoration projects) was not directly evaluated but represented by proxies of distances to roads and settlements for it is difficult to measure it directly as you state in the conclusions P2945 L9-11).
4. (P2945 L22-23) Could you provide any reference of other works using the same classification of the variables you used? If not, could you explain and support the classification selected?
5. As an innovative spatial analysis technique, the geographic detector model and the index used should be explained in detail (P2946). For instance, how do you calculated the mean values for the KRD evolution indexes for various levels of driving factors? How those values are interpreted?
6. A table including the PDs of the driving factors for both improvement and deterioration would be helpful.
7. According to the results the \sum PD of the factors considered is 0.779 for improvement and 0.957 for KRD deterioration (P2948 L21-23 and P2949 L15-17). Does it mean that there are complementary factors not included in this study with PDs of 0.221 and 0.043 respectively affecting the KRD evolution? If so, please consider to include a sentence stating this and explaining the difference observed between improvement and deterioration.
8. P2950 L8-10: sorry but in my opinion the results confirm that soil type influences KRD transformation, likely due to their different hydrological properties and susceptibility

to erosion, but not that “soil types are associated with water retention capacity and soil conservation”.

9. I do not understand the interpretation of the results included in tables 5 and 7 and the related discussion and conclusion. I understand that if $C > A+B$ there is an enhancement of the impact of those factors. However, if $C \leq A+B$, how could it be that there is an enhancement of the impact of those factors?
10. Could you include the scale of the geographic information in table 3 please?

Technical corrections:

1. P22946 L14: delete the “(“ before D.
2. P2952 L28: I miss a space between “factors” and “Febles-González et al. 2012)”.
3. P2953 L21: should it be $(A \setminus B) < PD(A) + PD(B)$?
4. Table 4 footnotes: Level 3 is not different from level 4.
5. Table 5 and 7: should it be “vegetation” instead of “vegetable”?

I trust the authors find the suggestions provided constructive and useful.