Solid Earth
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Discussions

Interactive comment on "Evaluation of soil fertility in the succession of karst rocky desertification using principal component analysis" *by* L. Xie et al.

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The paper submitted by Xie et al. is is under the scope of Solid Earth. However, the paper has to be strongly rearranged to be published. The importance of the work has to be integrated in a wider context and the authors have to do a better job in the justification of their work and the novelty. Some aspects of the methodology have to be revised and the description of the studied area has to be more detailed. The results section has been rearranged and some aspects in the discussions have to be better explained.

Abstract The abstract in the current form it is almost impossible to understand. Please

restructure it like this. Drop some lines about the study background, aim of the work, methods used, main results and findings. Line 6: Which stands? Line 6: Grades of what?

Page 3334 Introduction Line 23: Please give a broad focus to your study. Show some studies from other areas. Line 24-1 (page 3335): Rearrange this sentence. In the current form is not understandable

Page 3335 Line 2: Which anthropogenic driving forces Line 5: Delete "Y.B" Line 10-16: This should be placed in the materials and methods Line 15-16: Which classification methods with minor modifications? Line 17: Delete "and elsewhere" Line 20-25: Provide a reference to this idea. Line 25-26: "the quality"

Page 3336 Line 7: Delete "have not been achieved at present" Line 8: Delete "eco-" Line 10-11: Please delete "Those indicators that influence plant growth should be included into evaluating system." is redundant Line 14-19: Please provide the references from where you took this information. The authors should be acknowledged for their work.

Page 3337 Materials and Methods Line 7: Please provide some information about the soil type and vegetation cover in the studied area. Line 18: Delete "(RD)" Line 21: Delete "typical" Line 25: Please explain this sentence "evenly distributed by walking on the way like letter "S" over the area". Were the samples collecting randomly or using a grid design.

Page 3338 Line 3: Please describe how many samples you analyse per plot in the laboratory. Why did you use composite samples and then you divide it? Line 19-20: To calculate the CEC, you had to measure the cations. Please show the cations analysed.

Page 3339 Line 5: Provide a table with all variables analysed. It will be easier to the reader. Line 9: "principal component analysis" is not a descriptive analysis method Line 9-10: Have you test the data normality and homogeneity of the variances before use

a parametric test? Line 11-12: The ANOVA test do no assess the homogeneity of the variances. Please use the Kolmogorov test to test the data normality and the Levene test to assess homogeneity of the variances. Line 6-14: Please describe with better detail the statistical methods and with a logical order, descriptive statistics, data quality test, data comparison method(s) and Principal Component Analysis analyses. Line 15-17(page 3340): This part should be resumed and described in statistical analysis.

Page 3341 Line 6-7: Delete this, Describe directly the results. Line 8: According to the table 2 some post-hoc test was carried out. Please describe it in the statistical analysis section. Line 9: Change "TOC" by "Total organic carbon" Line 20-21: Delete. Describe the results directly. Line 22: Please mention in the statistical analysis the correlation method used. Line 22: Change "MBC" by "Microbial biomass carbon"

Page 3342 Line 13-17: It would be positive to have a graphic were we could see the ploted PC1 and PC2. Line 17-18: This is not true. According to the table 3, the correlation between TOC and AP and MBP is not significant. Please check it.

Page 3343 Line 12-13: Delete and describe the results directly. Line 15: The correlations of TOC, TN, TP and MBC are significant, but not strong. Delete "strongly" Line 20: Please describe the major findings of "Effects of succession of RD on soil fertility", discussed it with other works. The data obtained in the ANOVA analysis should be discussed also, not only th PCA results. Line 23: Delete S.

Page 3344 Line 1: Specify what do you mean with "so on"? Be precise in the discussion of your results. Line 1: Substitute "total N" by "TN" Line 6: Please explain why the variables of PCA 1 contribute to RD aggravation. Line 8: Change "worsening" by "decrease" Line 16: Change "satisfactory as expected" by not "correct" Line 16-18: Maybe the variables used (despite the large number) were not enough to explain the levels of RD. it would be important to drop some lines about this limitation and propose some potential co-variates that can explain RD. Line 21-23: Maybe climate variables, land use, topography of the studied area and soil type should be used in the PCA

should also be considered in a future work to explain RD.

Line 3345 Line 1-3: Please explain why burning could cause degradation. Line 4-5: This may be correct, thus this variables should be used in the model Line 6: Delete "Y. B." Line 8-11: On my humble opinion this propose is somehow extreme. Mountain closure foe the communities that depend on the resources of the studied area. Perhaps a better management would be the better thing and please show management practices that could decrease the RD. Line 16-1(Line 1 page 3346): Delete this. Describe the major findings and discussed. Use this information to discuss your results

Page 3346 Line 1: Change "MBC" by "Microbial biomass carbon" Line 21: What do you mean by "pre-researching" Line 23: TOC, TN, TP, MBC, MBN and MBP, were not strongly correlated. Please rearrange the sentence. Line 26-27: This needs a better explanation.

Page 3347 Conclusions Line 1: Change "RD affected evaluating" by "RD affected the" Line 3-8: This has to be revised with carefully. Some of these correlations are not strong

Tables Table 1: Change "Utilization" by "land-use". What do you mean by "forest conversation" Table 2: Please show only the letters if there is significant differences among study areas. Table 5: according to this table CMC has a non significant correlation with a coefficient of 0.449, and for example the correlation of TK with a coefficient of 0.145 is significant. Please check it.

Figures Figure 2: Please show the meaning of the hanging bars

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