

Rangeland degradation assessment: a new strategy based on indigenous ecological knowledge of pastoralists

Dear Referee,

Thank you for your valuable comments and suggestions on the language, structure and scientific aspects of our manuscript. We have modified the manuscript accordingly, and detailed corrections are listed below point by point:

General Comments:

- There is a severe problem with the statistics applied. The authors used a t-test on the Likert Scale data. This implies that the authors test whether the mean values of inside/outside plots are significantly different. Then they end up with a significant difference of 0.2 values on a scale from 1-5 leaving the question if this makes sense. It does not very much. The authors should have applied either a Wilcoxon signed rank test directly on the 1-5 values OR have applied a Chi-Square Test. I urge the authors to re-analyze the data with the Wilcoxon-test and then to rewrite the necessary parts.
 - ✓ Data are now analyzed with Mann-Whitney Test or Wilcoxon Signed Rank Test and the result and discussion sections are rewritten.
- The map in figure 1 should be redrawn (see comments in the pdf) and some photos of the area and the pastoralists could give the manuscript a fresher look.
 - ✓ The map is revised now but the photos are added.

Detailed comments:

- Is this bad? Why is this a problem and what do you mean with "classic" science? This sentence is too ambiguous, please reword.
 - ✓ The sentence is now rewritten.

- Some is a very bad word because it is very unspecific. Use the number of indicators you used.
 - ✓ The correction is done.
- This could be simply a village distance effect, but not related to the fence.
 - ✓ That is right but it is mostly related to livestock preference for grazing near fences.
- What does vast mean in this context? Can you number it down?
 - ✓ The sentence is revised.
- Rangelands are not per se ecosystems but land use systems. Ecosystems would be the steppes or savannahs the animals graze in. please reword.
 - ✓ In most references rangelands are addressed as ecosystem. As an ecologist, those ecosystems dominated by grasses, grasslike plants, forbs, or shrubs and dominated by herbivores are defined as rangeland. If you think it is ambiguous, will be revised latter.
- What do you mean by called here? Did you mean "caused"?
 - ✓ No, called=known as
- Oh - in the line 5 you said that "grazing [that] called (caused?) Rangeland degradation." please reword then the sentence in line 5
 - ✓ I think it is not necessary based on the previous comment.
- You mean "rangeland" management, right?
 - ✓ Yes, the word is revised.
- Who is "we"? The scientific community or the land managers?
 - ✓ Land manager. The word is revised.
- Plant species? Also endemics?
 - ✓ They can be endemic but I am not sure.
- What do you mean by "fields"? Do you mean areas for grazing? Please find a better word.
 - ✓ I meant rangeland. The word is revised now.

- Please replace "ones" with pastoralists. Otherwise it sounds odd.
 - ✓ The correction is done.
- Can you give citations for the methods?
 - ✓ The citation is added.
- How did you identify the indicators? Could elaborate a bit more on that? Did you search via keywords? How many papers did you review? Do you have a list of the original literature which you could supply in an additional appendix?
 - ✓ I prepared a table including indicators and related references. If it is needed I can add it as appendix.
- ? Hmm? What is the connection between LADA and your identified indicators? I do not get the point. Do your indicators come from the LADA or what does LADA provide in addition?
 - ✓ Our field assessment is based on LADA.
- How many indicators did you then finally have on your list? 5? 10? 100? Could you give a number here already? And maybe also supply information on the nature of these indicators? Otherwise it is hard to follow later on.
 - ✓ The finalized indicator are shown in Table 1.
- Not necessarily. Just choose the right statistics.
 - ✓ The statistic method is now changed to nonparametric.
- How did you do that? Using a GIS? Throwing darts? Wouldn't it have been good to identify in advance strong degraded and less degraded areas?
 - ✓ Actually we first find homogenous units (i.e. land units) and then based on their number, the area was assessed. It is the reason why the number of plot is different.
- Why do you have that unequal number of sites everywhere?
 - ✓ Previous comment.
- The t-test is not appropriate for Likert scale data. A quick search on "how to analyze Likert scale data" would have shown you that researchers agreed on that the median should be the central tendency, instead the mean. Thus the Mann-Whitney U test (also called Wilcoxon signed rank test) would be correct. Or even the chi-square test. See here for a paper on that issue:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3886444/>

- ✓ The recommended test is now applied.
- This should be in the material and methods section. The aim of your study was not to compile that list. Hence it does not belong here.
 - ✓ The section is revised.
- Maybe the areas where statistically significant, but where they also biologically different? What does a difference of 0.2 on a scale of 0-5 mean? The mean value tested by the t-test does not make sense here.
 - ✓ The section is revised based on new statistic test results.
- How was "productivity" defined? As the net-growth over a season? Or simply as the aboveground-biomass?
 - ✓ It was above ground biomass. Productivity is now revised as yield.
- Are you sure? Why not rabbits?
 - ✓ I am sure that it is kind of mouse. But not sure about scientific name.
- What different types do you mean? Aren't we talking about rangeland degradation of soil and vegetation? Could you give some examples?
 - ✓ I meant degradation components. The sentence is revised now.
- Likert Scale goes from 1-5! Do not use zero!
 - ✓ The correction is done.
- Please add a map of whole Iran as well. It is not important to see where your sampling points are, but rather the locations of the two villages in the context of the Golestan National Park. Maybe you can also add some photos of the fenced and unfenced areas?
 - ✓ The map is revised. The photo are added.