

Interactive comment on “Quantifying the impact of land degradation on crop production: the case of Senegal” by B. G. J. S. Sonneveld et al.

B. G. J. S. Sonneveld et al.

b.g.j.s.sonneveld@vu.nl

Received and published: 6 October 2015

Dear Sir,

We are grateful for the relevant and constructive comments that were given by referee #1 concerning our research article ‘Quantifying the impact of land degradation on crop production: the case of Senegal’. Below you find our responses on the comments.

We hope that the revision meets the standards.

Kind regards,

Ben Sonneveld

—— Comment referee: Page 1805/20 If severe degradation is reported only twice and

C1191

its weight is calculated the same as "moderate" and "strong" what is the purpose of such category.

Answer Author: The category "severe" was one of the options selected by experts to indicate the degree of land degradation. For agricultural areas this category was indeed only mentioned twice which impedes an ex post analysis to relate class to yields as we did for the other categories. We assumed, though that 'severe' was an the exceptional case and we assigned four times the weight of the corresponding area share to this category. We emphasize this line of reasoning in the sentence (page 1805)

Suggestion text amendments. Assuming that 'severe' degradation is an exceptional case we weigh its area share four times.

Answer Author: We hope this elucidates the matter. Furthermore, we would like to add the following sentence at the end of the paragraph of the previous sentence.

Suggestion text amendments. Finally, the weighted values were normalized to let the range of the land degradation index fluctuate between 0 and 1.

Answer Author: This adjustment will also help clarifying the next query.

—— Comment referee: If severe degradation is reported only twice (see above) how come that your assessment compares yields under "low" and "severe" degradation for sites defined by a combination of 3, 4, and 7 variables?

Answer Author: The explanation on the construction of the two categories that is used for the comparative analysis is given in the following sentence that appears in page 1806.

For these circumstances, we distinguish only two “treatment” levels, “low” and “severe”, depending on whether they are below or above the 0.1 threshold point of the land degradation index.

—— Comment referee: It is obvious to emphasise the important role of fertilisers

C1192

on crop production, but I like the phrase: "LD can not be mitigated by fertilisers".

Answer Author: Thank you. I found similar evidence in Ethiopia (Sonneveld, B.G.J.S. and M.A. Keyzer (2003). Land under pressure: soil conservation concerns and opportunities for Ethiopia. Land degradation and development. 14: 5-23).

————— Comment referee: Emphasising the role of better soils and their resistance to LD is always worthy. Globally they cover only 3% of the land cover but produce 40 % of the food and 90 % of cereals.

Answer Author: If you kindly allow me I would like to add this sentence on page 1808 after the sentence

Suggestion text amendments. ... that other unobserved effects might be at play as well. Yet, emphasizing the role of better soils and their resistance to land degradation is always worthy. Globally they cover only 3% of the land but produce 40 % of the food and 90 % of cereals.

Answer Author: Thanks on forehand for this contribution.

————— Other remarks in the supplement

Comment referee: Full stop after ... land degradation is obtained.

Answer Author: Page 1798. Correct. Done.

—————
Interactive comment on Solid Earth Discuss., 7, 1797, 2015.