

Interactive comment on “Local soil quality assessment of north-central Namibia: integrating farmers’ and technical knowledge” by Brice Prudat et al.

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We are very excited to have been given the opportunity to revise our manuscript. We carefully considered your comments. Herein, we explain how we revised the paper based on those comments and recommendations.

We hope that these revisions improve the paper following your suggestions.

General comments

Reviewer’s comment: From my point of view, it is an important paper, which could be improved significantly by using an international soil classification (WRB) and de-

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scription of the different KwsUs, making it accessible for a wider audience and allow for international comparison and land management studies in other areas comprising comparable environmental conditions.

Author’s answer and suggestions: We agree with this concern and we would add few soil descriptions, including pictures and FAO names. A short chapter following 3.2 “Technical analysis of farmers’ field experiences” will be added to explain the major trends regarding the WRB (reference soil groups, qualifiers). Add in Chapter 3.5.1 “Importance of a soil quality evaluation toolbox”: “Soil classification based on the FAO is used by Namibian institutions and is used to draw the Namibian soil map. Therefore, it could be appropriate to use for international and scientific communication. However, this classification system does not bring additional information that would benefit this paper and was therefore not discussed. FAO classification is orientated towards representing “primary pedogenetic process[es]” and does not aim at detecting soil differences at micro-scale, neither spatial nor temporal” (IUSS Working Group WRB, 2014). Therefore, the use of this classification is not relevant to highlight SQ differences at small-scale. Moreover, the classification of the described soils in the WRB is poorly informative given the low prevalence of diagnostic properties and horizons leading to poorly informative nomenclature.”

Reviewer’s comment: Photographic documentation of soil profiles (if available) and profile descriptions seem appropriate making it more attractive and better accessible to the readers.

Author’s answer and suggestions: Soil descriptions and pictures would be added (See above)

Reviewer’s comment: P7 L23: I don’t fully agree with the argument against the measurement of the Cations exchange capacity.

Author’s answer and suggestions: Change this section to clarify the decision (§Methods): “Cation exchange capacity and base saturation [...] were not measured in this

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study because the presence of calcium carbonates and soluble salt strongly influences the measurements, which makes results very difficult to use for comparison, especially considering the low expected values due to low cation exchanging materials (mostly clay and organic matter)."

Reviewer's comment: §2.3.2 Laboratory analyses: As high contents of carbonates and salts are expected it could be important to know which kind of salts are present to be able to adapt land management.

Author's answer and suggestions: We agree with this comment and suggest adding some information concerning the type of salts expected in the area. Add this information in §2.3.2: "the presence of calcium carbonates (secondary precipitations observed in various soil profiles) and soluble salt (high EC in ehenene, mostly NaCl)."

Reviewer's comment: It is not clear how soil fertility/chemical fertility, used in results and discussion, is defined in this study: Is it the potential of the soil to provide nutrients coming from natural sources or artificial with fertilizers? Or the plant available nutrients?

Author's answer and suggestions: Make clear what chemical refers to... §3.2 Technical analysis of farmers' field experience: "All these characteristics suggest the higher potential of omutunda to provide nutrients, coming from any sources, compared to the other KwSUs. This capacity is hereafter called chemical fertility."

Reviewer's comment: In the results and discussion, the authors refer to chemical fertility, I would suggest replacing chemical fertility with soil fertility, as chemical fertility includes available nutrient contents, which were not measured.

Author's answer and suggestions: We always used "chemical fertility potential" to clearly indicate that it is not the actual chemical fertility (related to nutrient content) but an indicator for the potential that the soil could reach if sufficiently fertilised. We think that replacing "chemical fertility" by "soil fertility" will add confusion to the reader.

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Reviewer's comment: §3.2, page 10: The authors suggest a high chemical fertility and chemical exchange capacity for the omutunda units. This is misleading since it gives the reader the feeling that this soil is highly fertile. It should be made clear that this is relatively seen.

Author's answer and suggestions: Changes in §3.2, P10 L1: "All these characteristics suggest the higher potential of omutunda to provide nutrients, coming from any sources, compared to the other KwSUs."

Reviewer's comment: Fig. 1 needs a reference of the satellite image and hydrology data.

Author's answer and suggestions: Add origin of the satellite images and hydrology data.

Reviewer's comment: Fig. 1: A little box indicating the section of the study area in the map of Namibia would be useful.

Author's answer and suggestions: Add the suggested box.

Reviewer's comment: Fig. 2 needs some clarification as it seems that pH and <20_m content was measured in high resolution and vary in depth.

Author's answer and suggestions: We would remove this figure, given the different depth resolution illustrated compared to the rest of the data used.

Again, we appreciate all your insightful comments and are thankful to you for taking the time and energy to help us improve the paper. We hope that the answers and the suggested revisions improve the paper.

Interactive comment on SOIL Discuss., <https://doi.org/10.5194/soil-2017-10>, 2017.

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