

## **Comment on soil-2021-12**

Jennifer Wardle (Referee)

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Referee comment on "Effects of environmental factors and soil properties on soil organic carbon stock in a natural dry tropical area of Cameroon" by Désiré Tsozué et al., SOIL Discuss., <https://doi.org/10.5194/soil-2021-12-RC1>, 2021

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### **General comments**

Overall well-written, informative and with some interesting points. Minor amendments to grammar, scientific content and references are recommended. I don't have a problem with old references as it's good to credit the people who originally came up with the findings. However, there should be a few more recent references included, especially for certain key points. I enjoyed reading the paper and would like to see it published, but there are a few scientifically unsound methods and conclusions I believe should be removed or amended before I would recommend it for publication. In short, these are the use of only four data points in statistical analysis and the conclusion that latitude explains the differences between sites when 3 of 4 sites are within around 35 km from each other. However, I think there is enough substantial information in the paper to be able to omit that particular conclusion. Please see the below comments which are largely replicated from my notes in the PDF.

### **Specific comments**

Line 22: T-SOCS is introduced without defining what the T stands for. Define it here instead of later.

Line 51: "Increasing the organic C or SOM, directly improves the quality of the soil, hence contributing"- Is that always true or only in soils with low SOM? This would benefit from clarification.

Lines 58-59: If this is still true, a more recent reference should be included. Soil and food choices seem to be on the agenda more in recent years. Otherwise, a slight rewording

would be good e.g. "has until recently been neglected".

Lines 63-64: This is very generalised. Can more figures and references be included here?

Line 82: As opposed to what? What is wrong with being available in reports?

Line 83: Good point which I believe is still largely true. Give more updated references. The references are too old for a key point like this as it is the basis of your paper.

Line 162: 7.9 is more alkaline than 6.8 is acidic - Perhaps better to omit "acidic" and say close to neutral?

Line 183: I would recommend changing the heading of either section 3.3 or 4.3 slightly to make them different.

Lines 190-195: There is potential for an informative figure out of this data which would be more beneficial than the figures with only 4 data points. Just a suggestion.

Lines 196-198: This sentence doesn't make sense to me. It says there is a clear link between T-SOCS and latitude but only about 70 km is covered in this study. Three of the four points are within approximately 35 km from each other. It seems very random to suggest these differences are related to latitude.

Lines 199-200: Only 4 data points are used for this when a minimum of 10 is recommended. Four data points are not reliable. I suggest omitting this or use all the replicates.

Line 201: Again, only 4 data points.

Lines 218-220: If this is correct, a better explanation would be beneficial here. How is the acidic nature of the studied Vertisols attributed to base parent materials?

Line 304: Has anybody found similar patterns since then?

Line 309: This is not high latitude!

Lines 310-312: I don't believe there is any evidence of this. From the location map, the southern most site is only about 70 km south of the most northern site with most sites being considerably closer to each other. I don't believe that is a reasonable distance to make judgments about latitude.

Line 312: The reference is incorrect or not listed at the end. Do you mean Tan et al. (2020)? Tan's study covered 3000 km which is a lot greater than 70 km.

Lines 313-314: This sentence makes it sound like Plaza et al had an  $r^2$  value of 0.7104 but from the figures I see it was this study. You only have 4 data points when a minimum of 10 is recommended for regression analysis. I therefore suggest that you don't report this in the text as it can't be considered reliable. Alternately, why not include the replicates?

Line 331: Yes, I thought this point would be closer to the beginning of the discussion since it is one of the first things mentioned in the abstract and there is a lot of detail about it in Table 1. You could make more of this.

Line 343: Again, I don't believe you can conclude this from this study.

Lines 357-358: I don't think there is a scientific basis for the statement of 71 % explanation based on the number of data points. The discussion on vegetation would benefit from being extended.

Line 378: Thank you.

### **Technical comments**

There are minor issues with grammar which mostly appear at the beginning of the text. This would likely deter potential readers from viewing what is otherwise a well written paper, so it would be beneficial to amend these. For example:

Line 14: "Researches" should be "Research" and referred to as "is" rather than "are".

Line 15: Research should not be referred to as "ones". Better to say "the few existing **studies** are...."

Line 36: "**Their** organic C stocks are crucial". Soil is referred to singularly in the previous sentence so would be "Its" rather than "Their", but it would be better to say "Soil".

Line 47: The word "their" is unnecessary and incorrect.

Lines 48-50: "Thus, loss of organic C or SOM results in the loss of soil quality and impaired associated functions including soil degradation, decline in agronomic productivity, food insecurity, malnutrition and starvation" Good points but the sentence needs rewording, malnutrition and starvation are not soil functions.

Line 72: Stock is singular so it should be "its" not "their".

Line 74: What is "they", soil? "Soil has the potential..." would read better.

Line 101 (and other places): sudano-sahelian – capitalise this to Sudano-Sahelian to be consistent throughout the text.

Line 159: Be consistent with capitals. Better to use BD than Bd.

Lines 212-213: Should be especially, not specially and no need for the word "and".

Line 305: Better to say "only a small fraction...."

Line 307: Delete the word "part".

Please also note the supplement to this comment:

<https://soil.copernicus.org/preprints/soil-2021-12/soil-2021-12-RC1-supplement.pdf>