

## **Egusphere-2022-281**

*Dear reviewers and editor,*

*thank you very much for your positive feedback and for your valuable comments that help us to improve the manuscript. Below we respond to your comments and explain how we revised the manuscript.*

### **Author's response for reviewer #1**

#### **General response:**

General comment:

I recommend that the manuscript be accepted with some revision. The topic clearly fits into the scope of SOIL and is of multidisciplinary interest as it aims to increase the sustainability of oil-palm plantations. The study design and methods are clear and could be reproduced. The results are fully explained and the discussion references relevant literature. Based on the results, the conclusions are warranted. However, there could be some discussion about how the soil type and characteristics might affect Si cycling in these systems. And while pedogenic Si might be a less substantial source in topsoils, the mineralogy of the underlying geology could be expanded upon in Lines 112-114.

*Lines 287 – 302: Thank you for this suggestion. We have now introduced a short section on how soil type and soil characteristics might affect Si cycling.*

*Lines 114 – 115: Thank you for your comment. We have now provided some information on the predominant minerals in these soils in section 2.1.*

To reinforce the interdisciplinary nature of the work, the discussion/conclusion might include reference to any planned outreach and whether the recommendations listed would be likely to be adopted by small plantations in the area.

*Lines: 389- 391: Yes, we agree and have added a concluding remark on the preconditions necessary for farmer to implement the suggested measures.*

Finally, in the interest of completeness, all of the data from the topsoil samples should be reported in the Appendix, not just the means.

*Page 20: We agree. In the appendix, we have added a further table (Table B2) with the data prior to the calculation of means in addition to the existing table (Table B1) which reports the means.*

#### **Specific response:**

Specific comments:

Line 70: Should be “contribute to a lesser extent

*Line 70: We have rephrased the sentence accordingly.*

Line 200: Provide the citations for the R packages.

*Lines 202 - 203: Thank you for pointing this out. We have provided the citations for the R packages.*

Figure 2: Indicate specifically what an a and b mean regarding the significant differences.

*Thank you for your comment. We agree and have specified what a and b mean regarding the significant differences.*

## Author's response for Reviewer #2

### General response:

General comment:

Si plays an important role in terrestrial biogeochemical cycling. The study analyzed the spatial distribution of amorphous silica and mobile silicon in topsoil of oil-palm plantations. And the authors concluded that smallholders could efficiently reduce erosion and support Si cycling within the system by (1) maintaining a vegetation cover in oil-palm rows and interrows, (2) incorporating oil-palm litter into farm management and (3) preventing soil compaction and surface-crust formation. The paper was very interesting and well written. I recommend the paper publishing on EGU sphere after minor revision.

*Thank you for supporting the publication of our work after minor revision.*

### Detailed response:

Detailed comment:

Figure should be redone. Color Figures are more expressive and easier for readers to understand, especially for Figure 1.

*Thank you for your feedback. We originally preferred black and white figures, but we agree that coloured figures can make it easier for the reader to catch the information at first glance. We have now used some unobtrusive colour in Figures 1 and 2 to enhance comprehension.*

PCoA ordination plot combined with multiple analysis of variance (adonis) may better reveal the research results.

*Thank you for this comment. Indeed, PCoA ordination plot combined with multiple analysis of variance (adonis) is a very useful tool. We thought about this idea but came to the conclusion that our study set up and situation is quite clearly defined: the management practice of frond-pile stacking being the key factor, whereas all other parameters are very similar within a plot; there is a good understanding of the causal relationships underlying the observed spatial pattern (general principal of phytolith release from decomposing palm fronds as an easily mobilizable Si source). So, in our case, the focus of the statistical analysis was more on testing the observed differences for statistical significance than on exploring e.g., any clustering. For this reason, it seems more straightforward and appropriate to us to use the tests that we have described in the manuscript.*

*For ease of reading and comprehension, we did some additional formatting (e.g., Fig. 3 and Tables B1- B4 in the Appendix).*