

Interactive comment on “Comparison of greenhouse gas fluxes and microbial communities from tropical forest and adjacent oil palm plantations on mineral soil” by Julia Drewer et al.

Anonymous Referee #2

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Drewer and colleagues present a manuscript about greenhouse gas emissions from tropical forest and oil palm plantation soils in the SABAH landscape of Southeast Asia. They compare emissions of N₂O, CH₄, and CO₂ between the two different land use systems, want to upscale their results and try to find links between microbial communities and greenhouse gas fluxes.

I think you should exclude the whole microbial part of the manuscript to strengthen the greenhouse gas flux part. It is hard to see a substantial link between your results from microbial analysis and the greenhouse gas fluxes. The microbial part of the discussion remains very speculative because you are comparing diversity/composition with

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greenhouse gas fluxes. It would have been better to have process rate measurements in the field (e.g. nitrification etc.) linked to functional gene abundance in soil samples where you had installed your static chambers (e.g. all the N-cycling genes, mcrA and/or pmoA). That would have been a sound story. Now you are reading two stories in one manuscript that do not strengthen each other.

The study design is the major drawback of the present manuscript. I do not understand why static chambers were not randomly installed. There was no plot selection as far as I can see. Why? There are only sites and per site you installed a different number of chambers (this is $n=1$) without any design!? How do you want to compare fluxes between land use systems if there are not enough replicates but only pseudoreplicates? How do you test differences of soil properties between the different land use systems? In my opinion the argument that Bayesian methodology is used to overcome the disadvantages of small sample size and high variability is very weak in your case. You could have easily selected few random plots within each site and then installed the same amount of chambers within each plot to overcome the different problems.

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