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Interactive comment on "Impact of land use and soil properties on soil methane flux response to biochar addition" *by* Weiwei Cong et al.

Y. Yan

yyerfudan@gmail.com

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Impact of land use and soil properties on soil methane flux response to biochar addition By Cong W, Meng J, Ying SC

The authors conducted a meta-analysis to quantify the impacts of biochar addition on methane fluxes in two types of soils (i.e., upland and paddy soils) across the globe. They synthesized 268 paired data from 50 publications and reported that response of soil CH4 flux mainly varied with soil physicochemical properties, but the biochar characteristics and management induced a more limited extent. In addition, the authors built a linear additive models, which can be used to predict responses of soil CH4 flux to biochar addition. The theoretical and methodological basis of this manuscript looks

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Discussion paper

solid. There are some interesting results and the explanation of results is reasonable. This study adds strong evidence of the knowledge in this area. However, I recommend a major revision of the manuscript. Here are some comments, and hope to make the manuscript more convincing and attractive. 1. Title should be revised and I suggested "Impact of land use and soil properties on responses of soil methane flux to biochar addition: a meta-anlysis". 2. Please add the heterogeneity test for the biochar effect among different subgrouping categories. 3. The authors need funnel plot and fail-safe test to address publication bias. 4. The current organization is descriptive, and no mechanistic understanding is presented. I believe a certain level of theoretical framework would be workable and adds valuable information to the manuscript. I suggest the authors develop a conceptual framework to organize the knowledge. 5. What is the significance of the results to our current knowledge gap? I think the authors may need to discuss it, at least providing some perspectives. 6. The authors should elaborate on the linear additive models in the discussion, including the scientific and practical significance, and deficiencies and future works. 7. It would be better to merge the subgraphs together in Figure 3. 8. The red lines in figures are not convincible, since only a few data are in some areas. 9. The manuscript needs to be largely improved in English expression. Here are some problems I found. Line 9, page 3. "the response of soils to biochar addition", I think is "the response of soil methane flux to biochar addition". Line 3-6, page 4. I am sorry, it is difficult to understand this sentence. Can you explain it better? Line 14, page 4. Please add publication year after "Jeffery et al.". Line 1, page 5. Biochar addition or biochar additions, please check it throughout the manuscript. Line 17-21, page 10. The sentence is too long, please rewrite it.

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