

## ***Interactive comment on “The effect of land-use change on the net exchange rates of greenhouse gases: a meta-analytical approach” by D.-G. Kim and M. U. F. Kirschbaum***

**Anonymous Referee #2**

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Potentially this paper can be very important and it is good to see this attempt to quantify the impact of land use change on GHG fluxes. It is a difficult task, because there are not enough study sites, and available measurements are either too short or don't always measure all three GHG. So the picture remains incomplete. The authors claim that their study is the most comprehensive, I am not sure that this statement is justified. My main criticisms of this study are

1) Lack of information of the data shown in the supplement:

You need to introduce this data set and supplement at the beginning of the method section. In the main paper you should include the stats of your data : fraction of data

C974

points per climate zone; per gas; per land use change category.

(2) Poor structure/presentation:

One normally does not discuss data in the method and result sections; but one normally does discuss data in the discussion section. So please edit your manuscript accordingly. The subscripts in equations are not explained adequately.

(3) Omissions and poor clarity:

You need to support your statements with data from the literature in a much clearer way. For example:

Section 2.2.1: We assumed that 75% of the biomass C stock in the biomass of 2ndary forsts can accumulate over 100 years: Please tell us how you have derived this 75%.

Abstract line 21: put 5.5 Gt Co<sub>2</sub> eq/y into the context of overall annual global emissions

Section 1 Page 4: nitrous oxide processes: change bacteria to microorganisms, as fungi also contribute to N<sub>2</sub>O

Section 1 Page 4: add references for LUC influences CH<sub>4</sub>, N<sub>2</sub>O

Section 2.1: Which category includes the intensively managed grasslands typical for Western Europe and New Zealand?

Section 2.2 do you use the 100 year time horizon GWP?

Table 4: the explanation how delta S was calculated is not clear. Generally the legends could all be improved.

Section 4.3: I can't see why compaction should decrease N<sub>2</sub>O reductase. I thought the opposite would be the case, compaction increases anaerobicity so should increase N<sub>2</sub>O reduction to N<sub>2</sub>.