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Earth System Dynamics
Discussions

Interactive comment on "A global assessment of gross and net land change dynamics for current conditions and future scenarios" *by* Richard Fuchs et al.

Anonymous Referee #2

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Review of ESD-2017-121: "A global assessment of gross and net land change dynamics for current conditions and future scenarios " The manuscript by Fuchs et al extracts the gross and net land changes using remote sensing products at the continental scale to create a new global gross and net land change dataset. Based on this dataset, authors find that the gross land changes within 0.5-degree grid cells were substantially larger than the net land changes in all parts of the world. When applied the present day gross and net land changes relationship to estimate in a future scenario, they find that the gross land changes consideration led to approximately 50% more changes globally compared to a net land change representation. The authors show that gross land changes are most important in heterogeneous land systems like shifting cultivation,

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smallholder farming, and agro-forestry. This study contradicts earlier studies, which assumed gross land changes to appear in shifting cultivation areas only.

I found that the paper is well written, the results are novel and have important implications for the studies that do not consider gross land use changes. I recommend acceptance of the paper after addressing the following concerns:

1) Page 6, l25: I do not really understand what do you mean by 'intersected all changes'?

2) Fig.3 forest over India?? I am surprised to see there is no forest over Southwest coast of India (so-called Western Ghats of India)! What resolution is this data! You mention this map is based on census and remote sensing data, then I do not really understand (mostly croplands). For example see the land use land cover map for (the year 2005, 100m resolution) India (https://daac-news.ornl.gov/content/land-use-and-land-cover-india)

3) I face difficulty in understanding how you derive gross/net land changes for the future scenario at the methods section. You derive empirical relationship from observed present-day data–→then used in this empirical relationship in CLUMondo model to derive for the future scenario??? I feel figure 4 is not clear enough to convince the readers the method of deriving gross/net change ratios.

4) How do you deal with very small fractions in the denominator while calculating gross/net ratio? Worth mentioning in the discussion section.

5) Worth mentioning 'how you estimate the accuracy of the datasets'.

6) Could you provide expansion of the 'LNCD', CORINE, RCMRD, MOFOR in the caption of Figure 1?

7) At 2nd line in the first paragraph of page 9: expand LC

typo: remove repeated 'that' in the first line of Conclusions section.

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