

Earth Syst. Sci. Data Discuss., author comment AC4  
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## Reply on CC4

Giacomo Grassi et al.

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Author comment on "Carbon fluxes from land 2000–2020: bringing clarity to countries' reporting" by Giacomo Grassi et al., Earth Syst. Sci. Data Discuss.,  
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### **Thank you very much for the useful comments. Please find below a point-by-point reply (in bold) to your comments.**

In the context of large expected contributions of the FOLU sector to achieving the net zero emissions by 2050. Several studies pointed out the discrepancies between top down studies and bottom up aggregation of data from countries reporting to the UNFCCC, as well as differences between top down modelling. Efforts, such as this paper, to point out and understand these discrepancies are critical at this point in time when countries are starting the process to collectively assess progress to achieve the Paris Goal through the first Global Stock Take to be concluded by the end of 2023. The paper goes beyond and proposes a compiled time series for 192 countries built upon multiple data from five sources (GHG national inventories, Nat Comms, BUTs, REDD+ submissions, NDCs) that makes available as a basis for further analysis.

The construction and choices made are well documented and transparent, and the original data is identifiable in the tables of the database. This allows for the reconstruction and work on alternative choices or criteria for the construction, highlighting the transparency of the work done.

The comparison with the estimations made by FAOSTAT highlight the importance of incorporating emerging more accurate data from improved reporting by countries that not always is provided to all data compilers or statistics at global level. Which leads to sometimes simplifications that can lead to misunderstandings or misuse of data (for example in modelling exercises).

Overall constitutes a first key step to provide a common basis for further global analyses in the coming months. And that can contribute to the Global Stock Take in relation to a very difficult and potentially controversial sector.

### **Thanks for the nice words and the constructive and useful comments below.**

Some comments that may be useful for the authors in successive improvements of the data base:

- On the completeness tables in the supplementary information, it will be desirable to identify from which source if there are several each of the columns comes from.

**The sources are the same as the one indicated as “selected” in Supp table1 (online). We now added this column also in Supp Table 2 (online), to increase clarity.**

- On the estimated uncertainty (page 11 line 270 -285) a good explanation is provided, but could the authors elaborate more on other possible factors such as AD sources (statistics/NFI versus Remote Sensing products for example).

**The 2 problems identified refers to errors in the application of IPCC good practice. Regarding the use of 2 alternative approaches to collect data i.e. sampling versus census, IPCC considers equally consistent with good practice both approaches. Sampling is usually the most applied method given that is less resource intensive; while census (including wall-to-wall) providing more data may result more accurate, although this is not necessarily true since complexity may more likely. determine sources of bias. Anyhow we did not make an analysis of methods used and of the associated quality of area data, which is often determined by how the methodological approach is applied.**

- Understanding that the information on other land uses than forest, it will be good in the future to reflect in a more disaggregated manner by land uses and use conversions this estimates. Please confirm that when referring to Forest lands it refers to forest lands remaining forest lands, and clarify how the lands converted to forest are dealt with in the paper, as well as the HWP data.

**As explained in Table 2, in our study (consistently with the IPCC / UNFCCC reporting tables) we use the term “forest land” to refer to the sum of “Forest land remaining forest land” and “Land converted to forest land”. In the same table, HWP is also allocated to “forest land”. To increase clarity, this information is added also in the caption of Fig. 4.**

- In the supplementary table 2, can the authors explain differences between the LULUCF column and the others.

**LULUCF is sum of other categories. Now this information is added in Supp table 2 (online), as suggested**

- An expanded table per countries with land use and pools where data available and how many years, and if the methods in different years are compliant with which IPCC GL will be useful in future updates of the data base.

**For the whole LULUCF, originally not gap-filled data (‘how many years’) are already included in Suppl Table 4 (online) . We now added in Suppl Tab. 1 (online) new information of the IPCC guidelines used (based on the information we found). On pools, we added a new table in the main text (tab. 5) with key statistics on carbon pools (number of countries reporting, average CO<sub>2</sub> fluxes) for the main land use categories and sub-categories in the NGHGIS of AI countries. As suggested, in future updates we will try to add more information on carbon pools of NAI countries.**

**Online tables are available here:**

**<https://zenodo.org/record/7034483#.Yw3otOxBxm8>**