

Interactive comment on “Drainage of organic soils and GHG emissions: Validation with country data” by Giulia Conchedda and Francesco N. Tubiello

Anonymous Referee #3

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This study is a highly valuable and useful further development of the dataset on drained organic soils emissions already available on FAOSTAT. While that dataset was a picture of the global situation in 2000, here the authors produced a spatially-explicit timeseries of global estimations for the period 1990-2019 through the use of the ESA CCI Land Cover dataset, which offers yearly global land cover maps for the years 1992-2018. The other datasets remained those used in producing the previous FAOSTAT dataset: the HWSD map to identify histosols (adopted as proxy for organic soil, based on the IPCC guidelines), and the FAO Gridded Livestock of the World to identify grazed land. The work is extremely valuable due to the importance of emissions from drained organic soils in the global carbon budget, and the very limited data available about this carbon pool and GHG source. Organic soils contain about 30% of the total soil carbon

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despite their relatively limited global area, and drainage of organic soils for agriculture or grazing purposes releases enormous amounts of carbon and N₂O (a very powerful GHG) for long time periods (decades after the drainage). Drainage of organic soils has increased dramatically in the last decades for agricultural purposes, especially in South-East Asia. Information on areas of drained organic soils used for agricultural or grazing purposes is therefore essential in GHG emissions assessments. A very important added value is that this study implements the Tier 1 IPCC methodology, which can be used for producing GHG inventories in the context of the global climate treaties, making it a very useful tool also for inventory preparation. No other dataset is at the moment providing this yearly information at the global level and in a spatially explicit way (although at the moment the data will be primarily distributed as country and regional statistics through FAOSTAT). Overall, this dataset is an important new part of the FAOSTAT emissions database. The paper is well written but needs some adjustments for increasing clarity. Here some suggestions beside what has been already suggested in other comments. - the authors say that their dataset covers the period 1990-2019, but the ESA-CCI timeseries cover the period 1992-2015 (then extended to 2018). Please clarify this point. - I would add some more details to the description of the datasets used. For example, to which year the livestock map refers to? How it was produced (just some details)? Which is the spatial resolution of the grid? - how is the proportion of areas of the various categories within each pixel assigned? i.e. how is the original LCCS legend used by the ESA CCI product translated to the IPCC land use categories? - Page 5 line 148: I suppose that the weighted averages refer to the Implied Emission Factors contained in the FAOSTAT dataset, not to the Emission Factors used in the estimation, which is done at pixel level and not at country level. - there are some minor language issues (e.g. page 4 line 105 "must be indeed be"), etc. so a thorough language revision would be useful.

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