

Earth Syst. Sci. Data Discuss., referee comment RC2  
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## Comment on **essd-2021-389**

Anonymous Referee #2

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Referee comment on "Pre- and post-production processes increasingly dominate greenhouse gas emissions from agri-food systems" by Francesco N. Tubiello et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-389-RC2>, 2022

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The dataset is of interest but the methodology and underlying data is not described in the article. It is described in FAO Statistics Working Paper Series working papers, but it is not acceptable to have the methodology central in the data setting not described in the article (or in other peer reviewed articles). In particular, those methodologies are supposed to be peer reviewed, and also available (possibly as supplementary material) with a reviewed article. The methodologies from those working papers can be shortened, but upon reading them it seems that simply copying over most of the information, maybe with a summary in the main paper and a development in a supplementary material, or all in the main paper depending on the style of the review would be good as they are well written and describe adequately the methodologies. Another reason to bring those in the article is that there may be some additional peer review comments based on those methodologies.

It is somewhat unclear if additional data should be provided along with the main dataset. For instance shares of the food system. However this cannot really be discussed if the underlying methodology is not presented and discussed.

Most of the informations and the data corresponds to an already existing article, Tubiello et al., 2021a "Greenhouse gas emissions from food systems: building the evidence base". Therefore I am not sure about originality, but it may be normal as here the dataset is the focus. It makes all the more important to describe the methodology in the data article as it would be some originality.

The dataset combines different and incompatible disaggregations and nomenclatures, which is an interesting and important point of the methodology. There is an explanation of the relationships between the nomenclatures in figure 1, and in the <https://zenodo.org/record/5615082> page. It is badly explained in the article, only very briefly in 2.1, although describing the data should be important in the article.

For the general public, as the dataset combines different and incompatible disaggregations and nomenclatures it is not clear if it would be of interest. Although it is important to have those informations to understand the methodology and how these data can be derived from the PRIMAP data based on the IPCC nomenclature, for a non specialist this makes a very unclear dataset.

A comparison with Crippa et al would also be welcome as it is a similar work with care to explain what is exactly the same when Crippa et al has been used as a source. It is already done adequately, as far as I can tell from my readings in the Working Paper Series working papers, but it should be in the peer reviewed article and may trigger additional comments here.

More remarks

p 4 | 33 and following, the discussion about uncertainty does not add much information, all the information is quite generic. There is some validation done in the FAO Statistics Working Paper Series articles, this should be presented/discussed here.

p 4 | 25 The Step 4 of imputation of missing emissions is not clear (missing how?). It should be associated with additional data showing which data is imputed and which data is not.

p 6 | 35 3.2 Regional Trends

The numbers per regional blocks or countries are not very interesting as the populations may be very different. Also some goods may be exported which makes these numbers also difficult to interpret. Some emissions are directly linked with the consumption, so should be local, but it is not the case for processing, packaging and fertilizer production.

p 8 | 7 the database FAOSTAT-PRIMAP is not introduced before nor really presented. It should be presented and even be available with this data, as if I understand well it is the data which corresponds to the methodology, the data presented is an aggregation.

A minor remark, since the data is about reorganizing disaggregated data in different categories, the comparison of nomenclatures can be of interest in terms of methodology to understand the strength and limitations of each nomenclature and warn about uses. However, this is not done at all in the article.