

It was very difficult to follow your manuscript corrections and the changes related to reviewers' comments. The authors answered some questions and did some major corrections, but there are still several points that need to be developed in the manuscript. Additionally, it does not seem correct to say and conclude that lime should be considered as a carbon sink when the results show lime as a carbon source, as already mentioned in the previous comments. Please find my comments below.

General and technical comments

Ln. 12. Needs to be rewritten. Suggestion: "However, during the life cycle of lime production, the alkaline components of lime will continuously absorb CO₂ from the atmosphere during use and waste disposal."

It seems important to add standard deviation for all your result values. You mention the annual carbon sequestration of lime accounts for about 1.03±?? %, what would be the standard deviation associated to this estimate for example?

Ln.330. The annual carbon uptake by lime represents 1.65% of the global forest sink. This will result in a very low global annual carbon sink then. The global carbon sink is the sum of carbon sink from ocean, land and cement. So, the 1.65% of the global forest sink cannot be equal to 1.65% of the global carbon sink. Consequently, lime sink cannot explain the 1.55% of the missing global carbon sink. This paragraph does not seem correct. The net emissions of lime production and impact on global carbon budget is an important point that needs to be developed in your study. Please develop.

You mentioned in your reply that you used auto-regressive models and other methods to predict the data from 1963 to 2000, but the method used in your study obtained the largest coefficient of determination. This seems important enough to be mentioned in your manuscript. I would suggest adding the different methods coefficient in supplement information to justify why you used the linear regression method for your study.

Supplement information SI data 4 of "Lime material production and uses", how are calculated current year, previous year and total? What do the values represent? Captions to the different tables are missing.

It would be useful to precise which supplementary information table need to be read in the manuscript instead of just mentioning “see the Supplementary Information”. Additionally, might be better to have the supplementary Information in PDF as well.

Figure 1. What are the meaning for the different colors? You mention in Figure caption “double solid lines”, I do not see any.

Ln. 257. “This figure is higher” do you mean the results of the figure are higher?

How can your results be higher than Tong et al., 2019 if you considered an emission reduction scenarios?

The carbon sink increases with time but because the production has increase. This increase for both the sink and the emission seems to be proportional to each other. This should be mentioned in the discussion.

Ln. 360. It is not correct to say that lime should be considered as a carbon sink. The net emissions show a carbon source.

One of your conclusion should be that the sink associated with lime life cycle should not be neglected and should be considered for future carbon cycle studies. However, there are still some questions not answered in your study about the emission inventories used here which could overestimate or underestimate lime production or lime sink and make your results biases. More development should appear in your discussion regarding these aspects.