

Review of: "Open-Source Remote Sensing Determination of Carbon Emissions From Tropical Deforestation Scenarios in Southeast Nigeria"

Nam Thang Ha¹

¹ Hue University

Potential competing interests: No potential competing interests to declare.

1st REVIEW

Manuscript title: Open-Source Remote Sensing Determination of Carbon Emissions From Tropical Deforestation Scenarios in Southeast Nigeria

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The ideas of the manuscript are good to help estimate the CO₂ emissions from long-term deforestation, which enables the implementation of forest conservation and mitigation strategies for the country. Despite this, my personal review indicated a variety of writing and analyzing issues that the authors have to carefully revise before any consideration for publication in the journal. Here come the major and minor points:

Major points:

Line numbers must be added to the manuscript for review.

Is this an incomplete paragraph in the Introduction section?

Hence, the need for provision of up-to-date forest cover information for Nigeria, especially the South-eastern part where there are relics of tropical primary forests.

According to Ogbodo and Okeke (2023), Nigeria's five Southeastern states of Abia, Anambra, Ebonyi, Enugu, and Imo have a total of forty-seven

(47) government-owned protected forests. A total of 133,500 hectares of forest landmass is represented by these 47 forest reserves (Annex 2).

According to the Nigerian National Bureau of Statistics (NBS, 2017), the official gazetted area of the Southeast (SE) Geopolitical Zone in Nigeria is

2,898,700 hectares. Consequently, 4.61% of this total is accounted for by forest reserves, as reported by Ogbodo and Okeke (2023)

Introduction needs to be rewritten to clarify the current challenges and the purpose of this study. We observed a continuous decline of forest cover. Then what is next? What do the authors intend to do, and what are the main contributions of this study?

“Problem statement” should be a subsection under the section Introduction.

Recently, the Introduction section does not have a clear structure, mixing different problems with a writing style not sufficient for academic and scientific requirements. Please carefully revise these points, especially in the “Problem statement.”

Table 1 and much information about rainfall may not be required in the Study Site. Rather, the authors should provide readers with activities like logging, forest loss, and so on in this subsection.

“Field data were used to validate the processed remotely sensed data”: Is this data from the Green Forest Watch (GFW)? Please clarify.

“In terms of national forestry comparison inFigure 5” does not fit the content of Figure 5 “Total land (Km2) Map... ”

“In terms of national forestry comparison inFigure 5, Southeastern Nigeria accounts for 2.42%, whereas the South-South region accounts for

26.71%, the Southwestern region accounts for 24.63%, the North Central region accounts for 20.76%, the Northwest region accounts for 9.03%, and the Northeast region accounts for 16.45%” —> % of what? Uncompleted sentence?

How do you convince the readers about the certainty and confidence of obtained results when using analysis from the GFW? This is the most important points since all the results were delivered from this source.

“This subsection presents the findings of a tree cover gain analysis conducted for the southeast region of Nigeria between 2000 and 2020 as part of this PhD thesis, in a similar approach to the above-reported tree cover loss.” —> Please remove this from the manuscript.

The authors mentioned the GFW used Landsat imagery to deliver the analysis, however Figure 1 and Figure 7 seemed using the Planet image? Please clarify.

Section “Field data collection procedures” presented the field data collection and the authors mentioned the using of field data in validate results from remotely data (“Field data were used to validate the processed remotely sensed data.”). So, where are the analysis? I do not see those analysis in the Result section.

Do we need Figure 5 in section Result?

“iii. Trend of Nigeria's Southeastern Tree Cover Gains, 2000 - 2022

This subsection presents the findings of a tree cover gain analysis conducted for the southeast region of Nigeria between 2000 and 2020 as part of

this PhD thesis, in a similar approach to the above-reported tree cover loss. Southeastern Nigeria gained 81.3 kilometres of hectares (kha) of tree

cover, which is an equivalent of 2.8% of its total landmass, between 2000 and 2020 (Figure 7). Forest trees absorb 3.58 MtCO₂eq/year of carbon

emissions from tropical deforestation scenarios throughout the same time period. This corresponds to a net carbon sink of -2.38 MtCO₂e/year in the region.” —> Where do all these results from? If you obtained them all from the GFW, so I think this study fitting a Report rather than a scientific paper.

Similar argument for Figure 6.

Minor points:

Abstract

Should agree to 1 or 2 decimals, e.g.: *1.20 megatons of CO₂ emissions*, but *20.0 Mt of CO₂ gas was released*

Number of keyword should reduce to 5-6 words

since Year 2012 should be since year 2012

“i. Study site” should change to “3.1. Study site” under section Methodology. Please check and fix similar formats in the entire manuscript.

Figure 1 and Figure 2 are not clear. Please provide higher resolution figures.

“With some deviations, Table 3 summarizes the yearly rainfall rates per state that were observed in the South-East of Nigeria between 2012 and 2016” —> Table 1, not Table 3

“In this study, **274** tree stems were tagged” —> Please reformat and unbold the number 274 and check the entire manuscript.

Figure 5: NPA should be explained in the caption of Figure 5.

Figure 5 should remove the “0” after the coordinates.

Figure 7: Tree cover gain in which unit? Also, check the scale in Figure 7. 30 m to 50 km?