

REVIEWER'S REPORT

Manuscript No.: IJAR-58547

Title: Partial substitution of mineral fertilizers with cattle dung compost improves grain yield while reducing greenhouse gas emissions in irrigated lowland rice systems

Recommendation:

Accept as it is

Accept after minor revision.....

Accept after major revision

Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality			x	
Techn. Quality		x		
Clarity			x	
Significance		x		

Reviewer's ID: JPR-171

Detailed Reviewer's Report

This manuscript addresses a timely and important topic concerning the potential for organo-mineral fertilization strategies to enhance the sustainability of irrigated rice production in West Africa, specifically examining the effects of cattle dung compost combined with reduced mineral fertilizer inputs on both grain yield and greenhouse gas emissions. The research question is well-framed and relevant to current discussions on climate-smart agriculture, and the experimental approach employing twelve different fertilization treatments with measurements of CH₄, CO₂, and N₂O emissions is generally appropriate. However, despite these strengths, the manuscript contains several substantial methodological, analytical, and presentation issues that require thorough revision before it can be considered for publication. The most critical concern involves the study timeline, as the manuscript claims to have been conducted over two consecutive cropping seasons from July to November in 2024 and 2025, yet this timeline appears problematic given that the current date is 2026 and the second season could not have been completed at the time of manuscript preparation. This fundamental issue must be clarified immediately, and if only one season of data is available, the authors should revise the manuscript accordingly and acknowledge this limitation. Additionally, there are serious concerns regarding the soil analysis units, which are expressed in mg ha⁻¹ for properties such as available nitrogen, total phosphorus, exchangeable cations, and total iron, representing physically implausible values that should be corrected to appropriate per-unit-mass measures such as mg kg⁻¹ or cmol kg⁻¹. The statistical presentation also requires improvement, as the standard deviations accompanying means in Tables 4-6 do not clearly indicate whether they represent variation across replicates or seasons, and the authors should explicitly state their replication strategy and whether data from both seasons were pooled. Furthermore, the manuscript references Figures 1 and 2 for the correlation matrix and principal component analysis biplot, but these figures are entirely missing from the provided file, yet they are essential for interpreting the multivariate relationships described in the results and discussion sections. The conclusion section is inexplicably written in French while the rest of the manuscript is in English, representing an inconsistency that must be corrected. Several methodological details are insufficiently described, including the irrigation water management practices which are known to strongly influence methane emissions, the chamber placement and sampling protocol with specific justification for using chambers of 150 cm height enclosing only four rice plants, and the standardization of crop management operations. The rationale for selecting the specific compost rates and fertilizer reduction combinations is not

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adequately justified, and the authors should explain whether these represent realistic field application rates for smallholder farmers in Côte d'Ivoire. The study also does not calculate the combined global warming potential or CO₂-equivalent emissions, which limits the practical interpretation of environmental benefits given that N₂O has a global warming potential 273 times greater than CO₂. The authors should address the lack of economic analysis regarding labor costs, transportation, and opportunity costs associated with compost production and application, as this information would be valuable for assessing practical adoption potential. The highest grain yield of 9.60 t ha⁻¹ obtained with treatment T3 is substantially higher than yields reported for the same variety in previous studies, and this discrepancy warrants discussion. The negative correlations between grain yield and emission reductions, while interpreted as not statistically significant, show meaningful inverse relationships with r-values ranging from -0.35 to -0.49 that should be more thoroughly discussed. The reference list contains formatting errors and incomplete information that require verification and correction. The manuscript would benefit from professional English language editing to address grammatical errors and awkward phrasings throughout the text. In conclusion, while this research addresses an important topic and has the potential to make a valuable contribution to the literature on sustainable rice production and greenhouse gas mitigation, the substantial methodological concerns, missing data presentation elements, analytical gaps, and presentation issues outlined above require thorough revision. The authors should carefully address each of these concerns in their response letter and revised manuscript, ensuring that the study timeline is clarified, all figures are included, the units are corrected, the statistical presentation is improved, and the methodological description is sufficiently detailed. With major revisions addressing these issues, the manuscript would be suitable for publication and could contribute meaningfully to the field of climate-smart agriculture in West African rice systems.