

## 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    |        | ✓    |      |      |
| Techn. Quality |        | ✓    |      |      |
| Clarity        |        |      | ✓    |      |
| Significance   |        |      | ✓    |      |

Reviewer Name: **ANAPANA GOPAL**

### Reviewer's Comment for Publication.

### General Comments

The manuscript investigates the effects of partially substituting mineral fertilizers with cattle dung compost on rice grain yield and greenhouse gas (CH<sub>4</sub>, CO<sub>2</sub>, and N<sub>2</sub>O) emissions under irrigated lowland conditions in Côte d'Ivoire. The study addresses an important topic in sustainable agriculture and climate-smart rice production. The experimental design is appropriate, and the integration of agronomic and environmental indicators adds value to the work. The findings have practical implications for sustainable fertilizer management. However, several methodological, statistical, and editorial issues should be addressed before publication.

### Content and Originality

- The manuscript addresses a timely and globally relevant issue concerning sustainable rice production and greenhouse gas mitigation.
- The integration of rice yield and greenhouse gas emissions provides a comprehensive evaluation of fertilization strategies.
- The research gap is reasonably presented, but the novelty should be emphasized more clearly by comparing this study with previous organo-mineral fertilization research conducted in Africa and other rice-growing regions.
- The discussion mainly confirms previous findings and should provide deeper mechanistic explanations of why Treatment T3 outperformed the other fertilization strategies.
- The practical implications for farmers and policymakers should be discussed more explicitly.

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### Technical Quality

- The randomized complete block design (RCBD) is appropriate for the experiment.
- The statistical analyses (ANOVA, Pearson correlation, and PCA) are suitable for the objectives.
- However, additional statistical information would strengthen the manuscript, including:
  - Assumption testing for ANOVA (normality and homogeneity of variance).
  - Effect sizes and confidence intervals.
  - Justification for selecting the Newman-Keuls multiple comparison test instead of more commonly used methods such as Tukey's HSD.
- Details regarding experimental replication across the two cropping seasons should be clarified. It is not clear whether the seasonal data were analyzed separately or pooled.
- Information regarding calibration, accuracy, and detection limits of the S316 multi-gas detector should be included.
- Soil physicochemical characteristics were measured before the experiment, but post-harvest soil analyses would strengthen the conclusions regarding soil improvement.
- The manuscript would benefit from including global warming potential (GWP) or CO<sub>2</sub>-equivalent emissions instead of reporting each greenhouse gas separately.

### Language and Presentation

- Overall, the manuscript is well written and easy to follow.
- Minor grammatical and formatting inconsistencies require correction.
- Scientific names should be italicized consistently throughout the manuscript.
- Spacing between units and numerical values should be standardized.
- Figure and table captions are clear and informative.
- A minor editorial issue is that the **Conclusion section is written in French**, whereas the remainder of the manuscript is in English. The conclusion should be translated into English to maintain language consistency throughout the paper.

### Structure and Organization

- The manuscript follows a logical and coherent structure.
- The Introduction effectively establishes the study background but should conclude with a stronger statement of novelty.
- The Materials and Methods section is comprehensive; however, additional details on data quality control and experimental repeatability would improve reproducibility.
- The Discussion effectively compares results with previous studies but should further explain the biological and soil processes responsible for the observed responses.
- The Conclusion should also acknowledge study limitations and recommend future research under different agroecological conditions and longer-term field experiments.

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### References and Citations

- The manuscript includes numerous recent references (2021–2025), demonstrating that the literature review is current.
- Most references are relevant and from reputable journals.
- Reference formatting should be checked carefully to ensure consistency with the journal guidelines.
- A few additional references on greenhouse gas mitigation, integrated nutrient management, and long-term compost application could further strengthen the discussion.
- All in-text citations should be verified for consistency with the reference list.

### Overall Recommendation

The manuscript presents valuable findings that contribute to sustainable nutrient management and climate-smart rice production. The experimental design is sound, and the results demonstrate the potential of cattle dung compost to partially replace mineral fertilizers while maintaining high rice yields and reducing greenhouse gas emissions. Nevertheless, several methodological clarifications, statistical improvements, language corrections, and editorial revisions are necessary to improve the scientific quality and readability of the manuscript.

### Final Decision:

**Minor Revision**