

REVIEWER'S REPORT

Manuscript No.: IJAR- 52624

Date: 04-07-2025

Title: A comprehensive Approach to Above-Ground Biomass Estimation using multi-source data integration and Advanced Learning Techniques

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: **Sudhanshu Sekhar Tripathy**

Date: 04-07-2025

Reviewer's Comment for Publication.

(To be published with the manuscript in the journal)

The reviewer is requested to provide a brief comment (3-4 lines) highlighting the significance, strengths, or key insights of the manuscript. This comment will be Displayed in the journal publication alongside with the reviewer's name.

Reviewer's Comment for Publication

The manuscript presents a relevant and methodologically sound study on above-ground biomass (AGB) estimation using multi-source data integration and advanced machine learning techniques, including RF, XGBoost, PNN, and BNN. The use of Sentinel-2 imagery and soil properties strengthens the practical applicability of the work, particularly in the regional context of Yellapur, India.

The study is well-structured and addresses a timely problem in precision agriculture and environmental monitoring. However, some **minor revisions** are needed to improve clarity and presentation. These include refining figure labels and references, ensuring citation formatting consistency, and improving grammatical flow throughout the manuscript. Additionally, a clearer description of the experimental setup and more effective visualizations of key results would enhance the reader's understanding.

Overall, the paper is a valuable contribution and can be accepted after addressing the suggested **minor revisions**.

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Detailed Reviewer's Report

Recommendation: **Accept after minor revision**

Comments & Suggestions for Improvement

1. Scope & Relevance:

- The topic is highly relevant in the fields of remote sensing, machine learning, and sustainable agriculture.
- The integration of soil properties, Sentinel-2 data, and multiple algorithms (RF, XGBoost, PNN, BNN) reflects a robust approach to AGB estimation.
- The study provides practical value in the context of precision agriculture and biomass monitoring, especially in under-researched regions like Yellapur, India.

2. Structure & Technical Presentation:

- The paper includes all necessary sections, but formatting consistency and readability need improvement.
- Reorganize the manuscript to follow a clear structure: **Abstract, Introduction, Related Work, Methodology, Experimental Setup, Results and Discussion, and Conclusion.**
- Section transitions are abrupt in places (e.g., **from methodology to modelling techniques**).
- Please ensure that **all table captions are positioned above the respective tables**, as per standard academic formatting guidelines. **Currently, several table headings are incorrectly placed below the tables**, which may affect readability and presentation quality.
- Ensure that **all figures and tables are properly cited and explained at the appropriate points in the main text**. Each figure (e.g., **Figure 4, Figure 5, Figure 6**) and table should be clearly referenced and discussed where it is first mentioned. This will improve the coherence, clarity, and scientific rigor of the manuscript.
- **Table formatting is inconsistent, and some results (e.g., RMSE, MAE values)** would benefit from visual representation such as graphs or charts.

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- Add a clearer “**Experimental Setup**” section detailing tools, libraries, versions (e.g., Python, TensorFlow), and hardware.
- The **methodology lacks clear stepwise explanation**. Consider a **diagram** plus numbered steps to guide the reader.

3. Language & Style:

- The manuscript is generally understandable but requires grammatical polishing.
- Repetitive phrasing and long sentences reduce clarity. Revise for conciseness and academic tone.
- Some sentences lack proper connectors or transitions. Ensure logical flow of ideas, especially in the results and discussion sections.
- Avoid informal or overly subjective expressions such as “our study gives ...” which may weaken the academic tone. Instead, use objective and precise phrasing such as “this study provides a detailed analysis” or “the findings contribute significant insights into...”. Replacing subjective language with formal academic expressions will improve the manuscript's tone and readability.