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REVIEWER'S REPORT

Manuscript No.: IJAR-59524

Title: A COMPARATIVE ANALYSIS OF THE SEMI-AUTOMATIC AND AUTOMATIC APPROACHES TO 7 THE IDENTIFICATION OF CROPS AND AGRICULTURAL AREAS IN THE DEPARTMENT OF 8 LOUETSI-WANO (LÉBAMBA, GABON)

Recommendation:

Accept as it is .....

Accept after minor revision.....

Accept after major revision .....yes.....

Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality			Y	
Techn. Quality			Y	
Clarity			Y	
Significance			y	

Reviewer's ID: JPR-Dr.Shaweta Sachdeva

Detailed Reviewer's Report

1. The authors should clearly highlight the novelty and original contribution of the present study compared with the two previously published studies on which the comparison is based.
2. The authors should clarify whether identical training samples, validation procedures, preprocessing methods, and input features were used in both studies to ensure a fair comparison.
3. Since the algorithms were evaluated in separate studies, the authors should acknowledge potential methodological differences that could influence the reported performance and avoid attributing all improvements solely to algorithm choice.
4. The authors should provide detailed information about the distribution of the 246 GPS observations across training and validation sets, including the number of samples available for each crop class.
5. Random pixel-level splitting may introduce spatial autocorrelation and inflate accuracy estimates. The authors should consider spatially independent validation using separate plots.
6. The authors should investigate how class imbalance affects the performance of different algorithms and report the class distribution for each classification level.
7. Overall accuracy and Kappa coefficients alone are insufficient to evaluate classification performance. The authors should provide confusion matrices and class-wise precision, recall, F1-scores, and omission and commission errors.

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8. The authors should explain how an overall accuracy of 87.12% corresponds to a Kappa coefficient of zero in the Level 3 classification and discuss the implications of predicting only the majority class.
9. The three-level hierarchical classification framework should be explained more clearly, preferably with a workflow diagram illustrating the classes, input data, and processing steps at each level.
10. The conclusion that tree-based ensemble methods outperform neural networks should be supported by a controlled comparison in which all algorithms are trained and evaluated using the same dataset and validation protocol.
11. The authors should report the model configurations, hyperparameters, optimization procedures, and software versions used for each algorithm to improve reproducibility.
12. The authors should provide a more systematic analysis of the relationship between training-sample size and classification performance, if the available data permit.
13. The authors should explain how GPS observations, Sentinel-2 imagery, and drone imagery were integrated into the classification process and investigate why combining data sources did not consistently improve performance.
14. The authors should clarify whether the observed differences in classification performance are statistically meaningful and, where possible, provide uncertainty estimates for the reported accuracy metrics.
15. Since the study focuses on cassava and plantain in a single geographical area, the authors should discuss the limitations of generalizing the findings to other regions, crop types, and seasonal conditions.
16. The study uses Sentinel-2 imagery from April 2024. The authors should discuss how reliance on a single image limits the ability to capture seasonal and phenological differences between cassava and plantain.
17. The mathematical formulations presented in Tables 1 and 2 should be checked for accuracy, and all variables and symbols should be clearly defined. The authors should also explain how these theoretical descriptions relate to the models implemented in the study.
18. The authors should use consistent abbreviations for the algorithms throughout the manuscript and clearly define CNN/RNC, RF/FA, and MLP/RNA at their first occurrence.
19. The terms "banana" and "plantain" are used interchangeably in the manuscript. The authors should clarify the intended target class and maintain consistent terminology throughout the text.
20. The authors associate plantain cultivation with wetter, alluvial areas and cassava cultivation with better-drained soils. These interpretations should be supported by field observations or relevant environmental data.
21. The authors should improve the readability of tables and figures, standardize decimal notation, and provide clear captions that explain the main findings.

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22. The abstract should clarify that the reported increase in the Kappa coefficient from 0.63 to 0.89 reflects the best results from two separate studies rather than necessarily representing a controlled, direct comparison.
23. The discussion should distinguish between improvements in overall accuracy and improvements in identifying the minority crop class, as high overall accuracy may conceal poor class-specific performance.
24. The recommendation to prioritize tree-based ensemble methods should be moderated to reflect the study's geographical scope, limited sample size, and potential limitations of the validation procedure.
25. The manuscript requires thorough language editing to address grammatical errors, inconsistent terminology, awkward phrasing, and inconsistencies in reference formatting.