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REVIEWER'S REPORT

Manuscript No.: IJAR-59524

Title: A comparative analysis of the semi-automatic and automatic approaches to the identification of crops and agricultural areas in the department of Louétsi-Wano (Lébamba, Gabon)

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's ID: JPR-252

Detailed Reviewer's Report

Summary

The authors re-compare with their previous two papers [13,14] on cassava/plantain mapping around Lébamba (Gabon), finding that the tree-based ensembles (RF, XGBoost) perform better on small sample sizes than the neural and parametric classifiers, and that there is a larger difference between the performances of the various algorithm families than between the various data sources. The topic is one that is relevant in the data-poor regions and the limitations are openly admitted.

Major concerns

1. Limited originality. It is an "after-the-fact" analysis of the authors' own research; no new experiment or data is provided. The authors should include what is new and indicate that reuse of text, tables and the map is allowed.

2. Not a controlled comparison. The features, hyper-parameter tuning, class-imbalance treatment, and train/validation split are not specified, and can vary between [13] and [14]. The failure of the neural

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network (kappa = 0 for GPS data) is common in unbalanced classes with no weighting or resampling, and could be due to the implementation of the neural network rather than a weakness.

3. Claim that cannot be supported by analysis. It says that it is "statistical robust" and "sensitive to sample size", but there are no confidence intervals, repeated experiments, and experiments with different sample sizes. Table 5 demonstrates the strong source effect (Kappa = -0.00 to 0.63) as well as the fact that the algorithm does not "matters more than" data source (best Kappa values found were 0.63 and 0.89, respectively). Abstract ("more than") and Discussion ("at least as important") are in opposition.

4. Incomplete results and inconsistencies. Only the best model per corpus is displayed in tables 3–5, SVM, ML results are not shown, per-class metrics, confusion matrices and validation sizes are not shown. The Level 2 quotes Level 1 values (98.28%, Kappa 0.96); see Table 4, the Kappa (0.93) is identical, but the accuracy is small; 18/19 and 13/14 are comparable; suggesting very small validation sets.

5. Validation and generalisation. Spatial leakage occurs when random splits of pixels are done over 51 plots. Future Work should be made here: (all six algorithms, identical splits, plot-level cross-validation, confidence intervals). The recommendations for "tropical forest areas" from one site, one image and one crop pair are oversimplified, and there isn't any evidence to support the argument that the data was used for independent cross validation (the same data, the same authors, no maps).

Minor points

– Table 1–2 restores the formulae from a textbook and only adds a little; delete or cite. Explain what is meant by "semi-automatic/automatic" and "GPS/UAV/Combination".

– Kappa [12] gives the incorrect Landis & Koch paper (should be Biometrics 33(1):159–174); refs [13]/[14] are switched; medical literature refs [6] and [7]; key refs on RF/deep learning and spatial validation are missing.

– Add appropriate English abbreviations (CNN, ANN, RF, ML); correct "RNN", "perception", banana/plantain and corpus/dataset inconsistencies; add data/code availability.

Recommendation

Will be accepted after significant revision