Remote Sensing in Southwest Nigerian Rice Fields: Evaluating Yield Variability Assessment Through Monitoring Systems

Chinedu Okezie[1], Femi Adeniyi[2], Funmilayo Adebile[1,3]

[1] University of Ilorin

[2] Department of Software Engineering, University of Ilorin

[3] Department of Software Engineering, University of Lagos

Author notes

Chinedu Okezie is affiliated with University of Ilorin and focuses on Computer Science research in Africa.

Femi Adeniyi is affiliated with Department of Software Engineering, University of Ilorin and focuses on Computer Science research in Africa.

Funmilayo Adebile is affiliated with University of Ilorin and focuses on Computer Science research in Africa.

Abstract

Remote sensing technologies have been increasingly adopted in agriculture to monitor crop health and yield variability over large areas efficiently. A multi-temporal analysis was conducted using Landsat-8 satellite data to assess yield variability. Ground-truthing involved GPS measurements and field surveys. Satellite-derived Normalised Difference Vegetation Index (NDVI) correlated with ground-truthed yields, showing a strong positive relationship with an R^2 of 0.75 in the validation dataset. Remote sensing technologies offer promising tools for monitoring yield variability in rice fields but require further refinement and integration into existing agricultural practices. Further research should focus on integrating remote sensing data with local climate, soil, and socio-economic factors to enhance predictive accuracy. Model estimation used $\hat{\theta} = argmin\{\theta\} \, sumi \, ell\left(y_i, f\theta(\xi)\right) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, GIS, RS, precision agriculture, remote sensing, geographic information systems, yield assessment*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge