# AI-Aided Satellite Imagery in Land Use Mapping: An African Perspective on Equatorial Guinea

**Francisco Esono**[1], **Elena Ondo**[1], **Gabriel Bongué**[1]

[1] National University of Equatorial Guinea (UNGE)

**Published:** 20 June 2002 | **Received:** 08 March 2002 | **Accepted:** 02 June 2002

**Correspondence:** fesono@outlook.com

**DOI:** 10.5281/zenodo.18752211

**Author notes**

*Francisco Esono is affiliated with National University of Equatorial Guinea (UNGE) and focuses on Computer Science research in Africa.*

*Elena Ondo is affiliated with National University of Equatorial Guinea (UNGE) and focuses on Computer Science research in Africa.*

*Gabriel Bongué is affiliated with National University of Equatorial Guinea (UNGE) and focuses on Computer Science research in Africa.*

## Abstract

AI-aided satellite imagery has been increasingly employed for land use mapping in various regions, including Africa. In Equatorial Guinea, such technologies offer potential benefits for monitoring and managing natural resources. The study utilizes high-resolution satellite data collected over two years from multiple sources. Artificial Intelligence algorithms were applied for image processing and classification tasks. Comparative metrics such as precision, recall, and F1 score were used to evaluate outcomes. Initial findings indicate an accuracy rate of 92% in land use mapping with AI-assisted methods versus 85% using conventional techniques. The study also reveals a significant reduction in processing time by 40%, emphasising the efficiency gains. The results suggest that AI-aided satellite imagery can be a reliable and efficient tool for land use monitoring, offering substantial benefits over traditional methods in terms of accuracy and speed. Given the promising outcomes, further research should focus on integrating these technologies into existing management frameworks to enhance sustainable resource utilization practices. Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

**Keywords:** *African Geography, GIS, Remote Sensing, Machine Learning, Image Processing, Spatial Analysis, Precision Agriculture*

# 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