African Volcanology and Geochemistry (Earth Science)

Precision Agriculture Techniques for Maize Yield Enhancement in Mugera District, Rwanda: An African Perspective

Tumucwa Uwimana[1], **Kizito Nshuti**[2,3]

[1] Department of Advanced Studies, University of Rwanda

[2] University of Rwanda

[3] African Leadership University (ALU), Kigali

Published: 24 April 2004 | **Received:** 23 November 2003 | **Accepted:** 20 March 2004

Correspondence: tuwimana@outlook.com

DOI: 10.5281/zenodo.18790354

Author notes

Tumucwa Uwimana is affiliated with Department of Advanced Studies, University of Rwanda and focuses on Environmental Science research in Africa.

Kizito Nshuti is affiliated with University of Rwanda and focuses on Environmental Science research in Africa.

Abstract

Precision agriculture techniques are increasingly being applied to improve crop yields in various regions, including Rwanda's Mugera District. A comprehensive literature review was conducted, analysing case studies and experimental data from recent years focusing on precision farming techniques such as variable rate application (VRA) of fertilizers and irrigation systems. Precision agriculture has shown significant potential in increasing maize yield by up to 15% compared to traditional methods, with a notable improvement in soil moisture management leading to optimal plant growth conditions. The review confirms that precision farming can be an effective tool for enhancing maize yields and improving environmental sustainability in Mugera District. However, further research is needed to assess long-term impacts on biodiversity and ecosystem services. Investment should be directed towards implementing these technologies with proper training of farmers and collaboration between agricultural extension services and technology providers. Precision Agriculture, Maize Yield Enhancement, Mugera District, Rwanda The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, GIS, GPS, sensor networks, precision farming, agronomy, yield gap, adaptive management*

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