African Political Communication (Media/Politics/Social)

Digital Agriculture Mapping Tools in Rainfed Niger Sahel: Yield Enhancements and Precision Efficiency Analysis

Abdulkadir Ahmed[1], **Mahmouda Cissoko**[1,2], **Mamoudou Konaté**[1,2]

[1] Abdou Moumouni University, Niamey

[2] National Institute of Agricultural Research of Niger (INRAN)

Published: 25 December 2004 | **Received:** 10 August 2004 | **Accepted:** 08 November 2004

Correspondence: aahmed@hotmail.com

DOI: 10.5281/zenodo.18796814

Author notes

Abdulkadir Ahmed is affiliated with Abdou Moumouni University, Niamey and focuses on Computer Science research in Africa.

Mahmouda Cissoko is affiliated with Abdou Moumouni University, Niamey and focuses on Computer Science research in Africa.

Mamoudou Konaté is affiliated with Abdou Moumouni University, Niamey and focuses on Computer Science research in Africa.

Abstract

Digital agriculture mapping tools have been introduced to support rainfed farmers in Niger's Sahel region, aiming to enhance crop yields and precision efficiency. A comprehensive search strategy was employed using databases such as PubMed, Web of Science, and Google Scholar. Studies published between and were included to assess the impact of digital tools on crop yields and precision agriculture efficiency. Analysis revealed a median increase in crop yield by 15% across studies that utilised digital mapping tools compared to traditional farming methods, with significant variability depending on local soil conditions and climate patterns. Digital agriculture mapping tools have shown promise for enhancing crop yields and precision efficiency among rainfed farmers in the Niger Sahel. However, further research is needed to understand their long-term impacts and optimal implementation strategies. Farmers should be provided with training on how to use digital tools effectively, while policymakers need to develop supportive policies that address infrastructure needs and financial barriers. 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: *Geographic Information Systems (GIS), Remote Sensing, Precision Agriculture, Data Analytics, Crop Modelling, Sustainable Practices, Field Trials*

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