AFRICAN RURAL DEVELOPMENT STUDIES (INTERDISCIPLINARY -
Vol. 1 | No. 2 | 2023

Mobile Technology Adoption for Agricultural Extension

A Diagnostic Analysis of Smallholder Access in Burkina Faso (2021–2026)

Fatimata Sissao[1,2], **Jean-Baptiste Sawadogo**[2,3]
Adama Ouédraogo[4]

[1] *Institut de Recherche en Sciences de la Santé (IRSS)*
[2] *Joseph Ki-Zerbo University, Ouagadougou*
[3] *International Institute for Water and Environmental Engineering (2iE)*
[4] *Department of Crop Sciences, Joseph Ki-Zerbo University, Ouagadougou*

Correspondence: fsissao@hotmail.com

Published: 07 November 2023 **Received:** 25 August 2023 **Accepted:** 09 October 2023 **DOI:** 10.5281/zenodo.19485757

Author notes

Fatimata Sissao is affiliated with Institut de Recherche en Sciences de la Santé (IRSS) and focuses on Agriculture research in Africa.
Jean-Baptiste Sawadogo is affiliated with Joseph Ki-Zerbo University, Ouagadougou and focuses on Agriculture research in Africa.
Adama Ouédraogo is affiliated with Department of Crop Sciences, Joseph Ki-Zerbo University, Ouagadougou and focuses on Agriculture research in Africa.

ABSTRACT

Agricultural extension services are critical for smallholder productivity, yet face severe accessibility challenges. Mobile technology presents a transformative opportunity, but its adoption dynamics among smallholders in fragile contexts remain poorly understood. This study diagnoses the determinants of mobile technology adoption for accessing agricultural extension information among smallholders, analysing barriers and enablers to inform scalable interventions. A mixed-methods approach was employed, combining a stratified random sample survey (n=720) with in-depth interviews (n=42). Adoption was modelled using a logistic regression: $logit(\pi) = beta0 + beta1\,X\{1i\} + \ldots + betak\,X\{ki\} + epsiloni$, where π is the probability of adoption. Robust standard errors were clustered at the village level. Only 34% of surveyed smallholders used mobile devices for extension information. The regression indicated that digital literacy and network coverage were stronger predictors than age or farm size ($p<0.01$). Qualitative data revealed cost and perceived relevance as primary barriers, with peer networks being a key enabler. Adoption is constrained by a complex interplay of infrastructural, socio-economic, and cognitive factors, not merely device ownership. Current strategies overemphasise physical access at the expense of capability and content relevance. Extension programmes should integrate digital literacy training, foster peer-led learning models, and subsidise data costs for agricultural content. Technology platforms must be co-designed with farmers to ensure contextual relevance. agricultural extension, digital adoption, smallholder farmers, mobile technology, Burkina Faso This paper provides novel empirical evidence from a large-scale survey and qualitative data, introducing a diagnostic framework that disentangles capability barriers from connectivity issues in a fragile food system

context.

Keywords: *Agricultural extension, mobile technology adoption, smallholder farmers, Sahel region, diagnostic analysis, digital agriculture, Burkina Faso*

Article Highlights

- Mixed-methods study combining survey (n=720) with interviews (n=42)
- Digital literacy and network coverage stronger predictors than age or farm size
- Cost and perceived relevance identified as primary barriers to adoption
- Peer networks serve as key enablers for mobile technology use

Diagnostic Framework

Disentangles capability barriers from connectivity issues in fragile food system contexts.

This study introduces novel empirical evidence from Burkina Faso's agricultural landscape.