

ABSTRACT OF THESIS

Thesis title: Drivers and Barriers to the Adoption of Agro ICT and Precision Agriculture in Africa: A Systematic Review

Author name: Josemar Antonio Ndembi Chissola

Course, level of education: Agricultural Engineering - Bachelor

Host Department/Institute: Institute of Agricultural and Food Machinery, Department of Agricultural and Food Machinery

Primary thesis advisor: Dr. Zoltan Bártfai,

Agriculture remains the foundation of African livelihoods and economies. Despite the transformative potential of agricultural information and communication technologies (AgroICT) and precision Agriculture (PA), their adoption by smallholder farmers in Africa remains slow and fragmented. This thesis addresses this adoption gap through a Systematic Literature Review (SLR) of 158 studies published between 2010 and 2025. The review reveals that research on this topic is recent, rapidly accelerating, and geographically skewed toward Anglophone countries such as Nigeria, Ghana, and South Africa, leaving large regions under-researched. Findings also show that the digital transformation in Africa is overwhelmingly "mobile-first," with 56% of studies focusing on basic mobile phones and apps. A core tension emerged, which shows that smallholder adoption is motivated by strong, rational drivers, but is severely affected by foundational, structural barriers. The most critical barriers are infrastructural deficits (poor internet, unreliable electricity), socio-economic limitations (low digital literacy, high costs), and the contextual misalignment of technologies not designed for smallholder realities. Finally, this thesis concludes that the adoption gap is not a technical problem but a human and systemic one. Realizing the promise of digital agriculture requires a strategic change from isolated pilot projects to building a supportive ecosystem. This includes public investment in foundational enablers (rural connectivity, digital literacy), promoting locally co-created, mobile-centric solutions, and implementing inclusive, ethical policy frameworks.

Keywords: AgroICT, Precision Agriculture, Africa, Smallholder Farmers, Adoption Barriers, Systematic Literature Review, Digital Agriculture