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## Digital transformation of smallholder agriculture: Enrolment of smallholder farmers into global production and marketing paradigms

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### Abstract

In South Africa smallholder agriculture has historically been neglected in favour of largescale agriculture, hence, smallholder farmers (SHFs), face challenges of inequality, limited access to information, lucrative markets, financial services, land, and other productive resources. South Africa is increasing focus on digitalisation to drive transformation to address the diverse challenges faced by SHFs. Mobile apps are the most accessible digital technology and are believed to hold many benefits for SHFs. However, based on evidence from past agricultural transformations that were ill-fitted and failed to benefit SHFs in Africa there are growing concerns that digitalisation will only benefit the larger, better resourced entities, extending their control and dominance over SHFs, and thereby diminishing smallholders' ability to make autonomous decisions regarding their farming paradigms. To contribute to this body of knowledge, this research critically examined the ways in which mobile apps are transforming agriculture for SHFs in South Africa. The multiple case study methodology guided by the critical theory of technology and self-determination theory was used. Four mobile apps and forty-two SHFs using the apps were purposively selected. The research found that proprietary mobile apps undermine the autonomy and competence of SHFs by enrolling them into global production and marketing paradigms, which demand skills and resources they often lack. This enrolment, despite the clear mismatch between these paradigms and the capabilities of smallholders, and in the absence of a conducive external environment, highlights a disregard for SHFs to benefit from digitalisation and from the new farming paradigms. Hence this study puts forward that to truly empower SHFs, there must be a fundamental shift in digitalisation efforts, prioritising their interests by either empowering them to succeed within these new systems or supporting them within their existing contexts, rather than subjecting them to systems where they lack adequate resources and must compete on unequal footing with larger, more powerful actors. The findings provide key insights for informing smallholder agriculture digitalisation policy and practice.

**Keywords:** Farming paradigms, mobile apps, transformation