



Tropentag, September 20-22, 2023, hybrid conference
“Competing pathways for equitable food systems transformation:
Trade-offs and synergies”

Can digitalisation contribute to sustainable transformation of smallholder agriculture in Africa?

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Abstract

Agricultural development of smallholder farmers in Africa is held back by several challenges. These include lack of information and knowledge, inadequate access to agricultural inputs and services, and poor connectivity to production markets. High hopes are pinned on digitalisation to bring about much-needed change in African agriculture, but there is limited empirical evidence on the nature and impact of such digital tools on smallholder agriculture. We examine the landscape of digital agriculture in Kenya, an agricultural country and a leading centre for agricultural technology among low- and middle-income countries. Using a novel classification framework and a stocktaking approach, we analyse current technology trends to understand the extent to which these technologies are leveraging recent developments in sensing and analytics. This shows that the number of tools has tripled in ten years and there has been a shift from “simple” to “smart” digital tools that provide farmers with less generic and more tailored advice based on the data they input or data from sensors. Although the literature on the impact of these tools on smallholder agriculture is sparse, the potential impact pathways developed show great potential for further development of stronger value chains, increased market participation, improved food and nutrition security, higher incomes, increased environmental protection and climate resilience. To promote the contribution of digitalisation, we need to strengthen partnerships between private and public institutions to increase complementarity in e-extension and e-marketing, use publicly available satellite data that can give farmers a competitive advantage, develop legal frameworks for data management to promote trusted participation, and also advance a research agenda focused on the impact of these tools.

Keywords: Africa, agricultural transformation, classification framework, digital tools