

Transforming African agricultural markets through digital innovations

What we (do not) know

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This policy note synthesizes the key messages and lessons from existing evidence and trends in the development, deployment and scale up of ICT-enabled marketing tools. It is based on the recently published discussion paper titled ["Digital tools and agricultural market transformation in Africa: Why are they not at scale yet, and what will it take to get there"](#).

► Key messages

- ▷ Many digital innovations have been developed and deployed in recent years in Africa, many of which have only been implemented at pilot stages, with limited evidence of successful scaling.
- ▷ There remains significant marketing and institutional constraints hindering the development of some of these digital innovations, which may further explain disparate progress in countries.
- ▷ Differential access to digital innovations across genders and different typologies of households may trigger alternative variants of digital divide.
- ▷ Although the landscape of digital innovations in Africa offers several reasons to remain optimistic, the prevailing disconnect between pilots and scale-ups merits further evaluation.

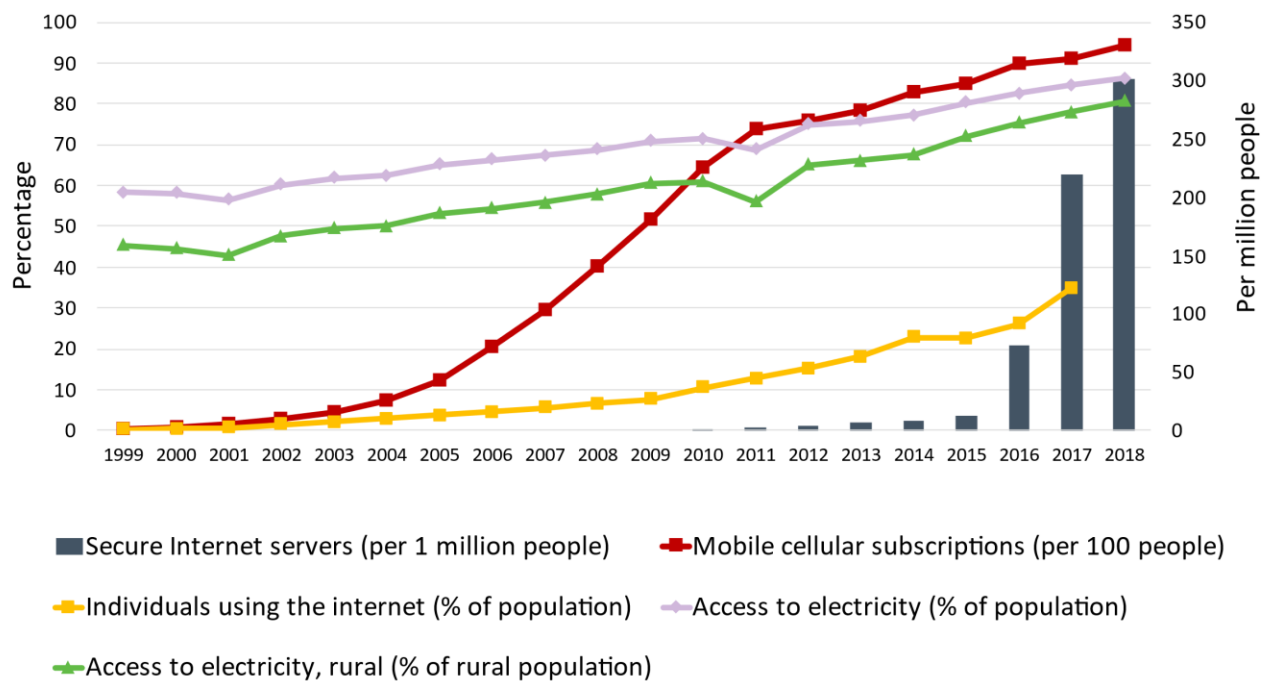
Motivation

The potential of digital innovations to transform agricultural markets in developing countries has attracted substantial enthusiasm in public discourse, development policy, and private enterprise and investment circles. Most of these digital innovations provide platforms to match buyers and sellers,

increase access to price information, and reduce the costs and risks of exchanges in goods and services. The near ubiquity of mobile phones and growing internet connectivity in the developing world represents an undeniably fertile landscape for the potential deployment of information and communication technologies (ICTs). ICTs, ranging from text message and interactive voice response to mobile apps, satellite imaging, and remote sensing, have the capacity to be customized to varying contexts to deliver services and information in a low-cost, large-scale, and timely manner.

Among their many contributions, ICTs can considerably transform agricultural markets, including their structure, organization, and function, with significant potential to address some of the persistent market failures and information asymmetries that are often found in developing countries (e.g., Jensen, 2007; Aker and Fafchamps, 2014; World Bank, 2016). This potential has necessitated the development and deployment of digital tools, platforms, and architectures that aim to radically transform agricultural markets. Over the past 15 years, digital connectivity has increased rapidly, with consistent growth in access to electricity, internet connectivity, and mobile cellular services, and, since 2016, a sharp rise in secure internet servers (Figure 1). These developments have the potential to be particularly transformative in Africa, where markets are comparatively under-developed, and agricultural production is carried out primarily by smallholder farmers operating small, fragmented farms which are often distant from urban areas (Aker et al., 2016).

Figure 1: Connectivity in lower and middle-income countries, 1999-2019



Source: World Bank, 2020; Spielman et al., 2021.

One of the most powerful illustrations on the importance of digital innovations can be gathered from experiences accumulated during the lockdowns that were introduced throughout much of the world — including Africa — to contain the spread of the COVID-19 pandemic. Although these lockdowns disrupted agricultural supply chains and markets in several countries, digital tools were used in some countries to maintain critical logistical and financial services—ultimately keeping agricultural inputs and commodities moving and markets functioning (GSMA 2021). Emerging evidence suggests that value chain actors who were already using digital solutions in their operations were less affected by the pandemic (e.g., Abay et al., 2020).

How can digital innovations improve the functioning of agricultural markets in Africa?

Digital innovations¹ can be looked upon as illustrative solutions to reduce transactions costs associated with the exchange of goods and services in imperfect markets, particularly where they usually resolve problematic transaction attributes such as frequency, uncertainty, and specificity (Williamson, 1975). For example, digital innovations can be designed to engage buyers and sellers in repeated transactions, which can ultimately contribute to reductions in the uncertainty, risk, and costs of monitoring and enforcing transactions in imperfect markets. Besides reducing frictions and transactions costs in existing markets, digital innovations can also create new marketing mechanisms by creating demand and supply. Below are some of the pathways through which digital innovations can transform the functioning of markets in Africa:

- ▶ Improve spatial and temporal market integration by addressing various forms of market failures, including information asymmetries and missing markets.
- ▶ Match demand and supply by improving input-use efficiency and coordinating transactions, thereby improving farmers' timely access to required inputs and services.
- ▶ Improve the accountability, transparency, and traceability of transactions.
- ▶ Improve value chain aggregation and formalization.
- ▶ Shorten supply chains in a manner that excludes commission agents and other “middlemen” and links producers directly to consumers.
- ▶ Facilitate efficient use of farm inputs and services, and hence improve smallholders' marketing potential and market participation.
- ▶ Accommodate and support farm budgeting and bookkeeping, farm management, and supply chain management.
- ▶ Improve resilience against unanticipated idiosyncratic shocks
- ▶ Improve data collection and dissemination.

¹ As of 2019, there are at least 390 distinct, active digital solutions focusing on agriculture, with two-thirds of these digital innovations having been launched during the three years preceding their survey (CTA, 2019).

The gap between pilots and scale-ups

Despite the development and deployment of many digital innovations in Africa, most of the empirical literature focuses on identifying impacts of pilot interventions, with little or no attention given to scale-ups. The lack of nuanced evidence and experience from both successful and unsuccessful scaling efforts impedes learning that may guide future scaling efforts. This lack of evidence and experience relates to several factors, including the possibility that it may just be too soon. But given the broad interest and enthusiasm for digital innovations in African agricultural markets, it is worth pointing out that there exists a significant gap between pilot and successful scale-ups in Africa's digital innovation space (e.g., Steinke et al., 2020). In fact, the persistence of small-scale pilots in the digital innovation space combined with the limited evidence of widespread use may point to a bigger challenge. It may be the case that many pilots and digital innovations are simply not scalable. Thus far, efforts to promote the adoption of digital marketing tools have required generous subsidies and incentives from governments and donors, with few such tools standing on their own as commercially viable products. In Table 1, we identify demand and supply-side constraints to scaling that may warrant greater attention.

Table 1: Demand and supply-side constraints to scaling

Demand-side constraints	Supply-side constraints
▶ Lack of context-specific needs assessment ▶ Inclusivity concerns ▶ Less accessibility for marginalized smallholders ▶ Gender gap and digital divide ▶ Accessibility and usability ▶ User trust and confidence	▶ Insufficient public and private investment ▶ Asynchronous pace of change ▶ Embeddedness of innovation ▶ Sustainable business models

Notes: Detailed discussion of these constraints is provided in Abay et al. (2022).

Harnessing the full potential of digital innovations

Although there is substantial enthusiasm around the potential of digital solutions to advance inclusive and sustainable agricultural market transformations in Africa, progress made thus far is limited to small experiments that are often donor-funded and short-lived. Reaping the full potential of digital technologies require both the development and utilization of wide-ranging digital solutions at a meaningful scale. This may require:

- ▶ Addressing human capital constraints that impede the creation and utilization of digital tools through establishing innovation hubs and IT business incubators.
- ▶ Investing in digital literacy through large-scale campaigns and education programs.
- ▶ Enhancing access to funds to support digital tool developers. While some digital tools may seem promising, their further development and growth may be impeded by lack of resources to spend on necessary marketing and campaign services.
- ▶ Increasing public and private investment in complementary infrastructure.
- ▶ Introducing “smart” regulations to incentivize digital and market innovation and
- ▶ Breaking anti-competitive behavior in the market: promote pro-market policies

- Continuous evaluation of the performance and impact of digital innovations to demonstrate both progress and pitfalls

Emerging risks and opportunities

There are encouraging trends suggesting the right steps are being taken across Africa to encourage digital innovation in agricultural markets. Ecosystems of small start-up enterprises are emerging in multiple countries, and governments are easing restrictions on the movement of talent from the African diaspora and between African countries to facilitate these enterprises². However, some constraints still abound. Beginning with the dispersed and fragmented nature of smallholder agriculture, this extends to the persistence of non-competitive market structures and the unequal distribution of market power. These may even be exacerbated in the presence of powerful actors with outsized influence over both the agricultural sector and digital space. In fact, it may be the case that digital innovations have no value in instances where powerful actors can prevent their adoption, like in the case of disruptive innovations. Some of these innovations need a critical mass in user participation to enable the sustainability of their services. That said, it remains unclear what public support strategies may help overcome these hurdles without compromising competitive market characteristics.

Our review of existing conceptual and empirical studies provides several reasons and justifications to remain optimistic about the potential of digital tools to help transform agricultural markets in Africa. However, most of the documented experiences involve pilots and small-scale experiments. Despite the plethora of case studies and impact evaluations of such programs, there is a surprising lack of documented scaling successes with digital marketing tools. More comprehensive assessments of tool development histories beyond the pilot stages are needed to understand the successes and failures of various scaling efforts. Further unpacking of the prevailing disconnect between pilots and scale-ups may provide important insights for guiding future investments and scaling efforts.

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²In several countries, tech incubators and developer hubs appear to be thriving (e.g., Kenya's Silicon Savannah, Nigeria's Wennovation Hub, South Africa's Silicon Cape Initiative).

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