Summary of e-conversation #2

How true is the #mantra that #small-scale producers benefit from #digitalisation?

Small-scale farmers are defined as farmers operating on two hectares of land or less. Similar limits in the size of holdings applies to producers in the livestock, agro-forestry, aquaculture sectors. There is a mantra that digitalisation is a pathway out of poverty and food-insecurity for them.

Is this true? Or does digitalisation only work for large-scale producers? Who are the small-scale producers who ultimately benefit from digitalisation, and what are the eventual preconditions? Are there examples of viable business models which can support such solutions apart from public/donor funded ones?

Highlights

- Small-scale producers may benefit from digitalisation. Having some basic skills to make use of digital solutions or use digital services for decision support is a pre-requisite. Being digitally-enabled or digitally informed offers different pathways towards transforming agricultural production.
- The digital divide is poignant and those who are either digitally-enabled or digitally-informed benefit from distinctive advantages than those who do not.
- When it comes to adopting or deploying D4Ag, SSPs operating in isolation are likely disadvantaged versus those operating under the umbrella of a cooperative or an association. SSPs growing the same crop in contiguous areas are likely to reach economies of scale for the deployment of D4Ag or for securing D4Ag decision support services.
- Medium to large scale production entities (including aggregations of SSPs) are those benefitting the most from D4Ag, although Kenya is cited as an example where specific digital services benefit also individually operating SSPs.
- Youth are more likely to adopt and embrace digitalisation and plays a key role within small-scale producers' families in the path towards transformation. Digitally-skilled youth with an entrepreneurial mindset were cited as engaging in the production of cash crops or niche agricultural commodities to increase their total income, in some cases originating from employment in non-agricultural sectors.
- Rather than digital solutions, a functional and inclusive digital ecosystem (different digital services and how they interact) should be considered as the potential driver towards the transformation of the agricultural sector.
- Bundling of digital services seems to be the most viable business model.
- Human-centred design approaches can ensure that digital solutions are built into the context of small-scale producers, finding what works best for them.
- Digitalisation carries the risk of individuals' data being harvested, assembled, and shared for profit by service providers and at a higher level, global data corporations. Individual sovereignty over data ownership and management is of paramount importance.
- There is a noticeable difference between SSPs who have access to a digitally-enabled device and those actually making full use of its functions or installed apps for informing their decision making processes.
- Objectively assessing the impacts of D4Ag on SSPs is of paramount importance.

Some Stats

13 Mar 2023	Starting date
17 Mar 2023	Closing date
40	Number of posts
30	Unique contributors
60	New members
10%	Contributors who are full/part-time farmers
Africa, North America and Europe	Geographic spread of contributors

Some takeaways

Bruce E. Smith, agriculture economist partaking family-run 90 ha grass-fed beef farm in Canada questions the enduring focus on small-scale producers who, on the long term would exit the industry in favour of highly efficient centralised, and automated production centres. The responsibility of development practitioners is to make the transition a positive one for SSPs. His opening, somehow provocative suggestion (followed by a detailed explanation (link to post)) consists in modifying the mantra "Digitization is the way out of poverty for small farmers" should be re-phrased, "Digitization is the way out of agriculture for small farmers". Ednah Karamagi supports Bruce's statement focusing on the fact that digitally-skilled, digitally informed small-scale producers are likely to price those who are not, out of the market.

Peter Ballantyne is of the opinion that the question of whether small-scale producers (SSPs) benefit from digitalization requires further unpacking. While it is likely that SSPs can benefit from digitalization, the extent to which they benefit may vary based on power dynamics and unintended consequences. It is important to differentiate between the benefits of individual SSPs using digital technologies and the benefits that can be achieved through more systematic approaches such as digitally-enabled cooperatives and government agencies. Additionally, SSPs can benefit from digital innovation throughout the value chain, even if they are not digitally connected. He further calls our attention on nuances worth distinguishing like digitally-enabled from digitally-informed farming. **Ednah Karamagi** (digitally-skilled farmer) proudly shares that she is a digitally-informed and relies on a cautious use of the Internet to experiment and take decisions. **Jacob van Etten** recalls that "digital services do not always reach farmers directly, but help to improve the efficiency of information exchange, data analysis, as done by service providers".

Kelvin Odoobo agrees with Ednah and highlights that many young people are engaging in agribusiness as a source of income in East and Southern Africa. However, the young agriprenuers are usually below the radar and not targeted by the public sector as they are not the typical beneficiaries of government or NGO programs. The first group usually grows staples and is a target because their value chains are crucial for national or regional food security, while the young agriprenuers are going into more business-oriented value chains that are demand-driven and less subsidized. They learn good agriculture practices more from peers and the internet and use digital tools to run their farm businesses as pioneers. According to Kelvin, these young farmers are in it mainly for the money, they use their savings from their main jobs to invest in farming and they are hungry for investment opportunities, including agribusiness. They live in urban or peri-urban areas but venture out into rural areas to find cheap land with good prospects. The author urges the public sector to target and support these young agriprenuers in a business-wise way, not for grants or donations, which could yield surprising results and help lower the average age of farmers in Africa.

Dr. Gilbert arap Bor, university lecturer and medium-scale farmer reports that digitalisation for agriculture is widespread in Kenya among small-medium and large scale agricultural producers citing as examples the e-voucher system for the distribution of subsidized fertilizer, making and receiving payments using Mpesa or Airtel Money, identifying pests by sending pictures to an agrovet or an agricultural officer, using the Kenya Agricultural Observatory Platform (KAOP) to get real time, location-specific accurate weather forecasts.

Drivers for adoption

For small-scale producers to harness the potential benefits of digitalization, there are several essential preconditions that must be met. These include access to affordable digital technologies and infrastructure, the availability of relevant and accessible content, and supportive policy and regulatory frameworks. Without these preconditions, small-scale producers may face significant barriers to effectively using digital tools and platforms, limiting their ability to compete in the global market (Arsene Birindwa)

According to Jacob van Etten, vertical integration (bundling) seems to be the most viable business model to 'monetize' investment in digital services. Farmers are not always ready to pay for information on its own, so bundling services makes sense. They will pay for it as part of the fertilizer or seed. An important reason is that consolidation works from a digital perspective, as organizations or individual farmers are less likely to deal with one app for each task. Also, farmers will buy more inputs if they also have a market to sell, so vertical integration makes sense from that perspective as well. However, this could also lead to a few players consolidating the market and less market power for farmers and their organizations. In the end, SSPs will indeed not benefit, but not because they are missing out, but because they are more effectively exploited by large players.

Small-scale producers have to find “added value” in a digital solution for embracing and eventually paying for its use (Ednah Karamagi)

Giacomo Rambaldi shared his experience with drone operators offering crop diagnostics or spraying services, where these realised that they could serve small-scale farmers in a financially sustainably manner, only if they would be contracted to deliver their services on a minimum hectarage depending on various factors and where contiguous production unit would grow the same crop.

Francois Stepman shared a “A good example of how small-scale producers benefit from digitalisation” consisting in the outcome of a study which examines the challenges of implementing Farmer Learning Videos (FLV) in Rural Advisory Services (RAS) through a holistic approach. As per Peter Ballantyne classification, this would be a case of digitally-informed small-scale producers.

Barriers to adoption

Depending on the country and local situation, digital technologies can be expensive, and not all farmers can access the necessary infrastructure, such as reliable internet connections and smartphones (Arsene Birindwa).

Access to digital services is generally limited for SSPs by low digital literacy, non-inclusive design of solutions, lack of access to devices, infrastructure, etc (Jacob van Etten).

Some digital farming apps are currently unable to live up to their promise of providing real-time information on weather, soil, pests, and other natural factors (an in-turn productivity gains) due to a limited number of mobile towers in African rural areas (Francois Stepman citing Daniels, C. et al, 2022)

There is still a significant knowledge gap on the deployment, uptake, and continued use of digital applications and platforms aimed at small-scale agricultural communities. These communities face practical day-to-day challenges related to old mobile equipment, high data costs, or little memory storage capacities. (Francois Stepman citing Daniels, C. et al, 2022)

Cross-cutting challenges

In the context of digitization, Om Goeckermann emphasizes the importance of individual sovereignty over data ownership and management. He argues that our personal information has been duplicated and rehashed over and over, making us an ID number in the databases of numerous corporations who collect and assemble our datapoints to share and sell them with each other for profit. To avoid this fate, Om advocates for an infrastructure that treats every individual as a sovereign independent entity, where all their data is contained on a blockchain as a verifiable receipt of one's actions. In such a system, individuals are in complete control of what is made public, and any entity that wants their data must come directly to them for it. Om believes that this approach will promote self-directed recovery, resource sharing, and resiliency in times of disaster and conflict, and lead to efficiency gains and better data quality for organizations and governance. He concludes that embracing technology should be accompanied by the insistence on sovereign designs rather than the extractive paradigm currently in place.

Laban MacOpiyo is of the opinion that Investment in digitization can bring benefits to smallholder agriculture, but it's not a silver bullet solution. Other factors like access to finance, markets, inputs, and extension services also need to be addressed. The effectiveness of digitization investment depends on how it is designed and implemented in collaboration with other stakeholders. Funding for digitization should be part of a comprehensive strategy that considers the specific needs and constraints of smallholder farmers and the broader agricultural sector, and it should be complemented by investments in other areas. Overall, investment in digitization should be approached with caution and seen as part of a larger strategy rather than a standalone solution.

According to Benjamin Addom, the use of digital technologies in agriculture has the potential to benefit smallholder farmers, but there is still a long

way to go to fully harness its full potential. Despite increased awareness, research and investment in the sector, in 2019 less than 40% of Africa's smallholder farmers had access to digital services, and active use was as low as 20% according to the CTA/Dalberg study. However, if large-scale commercial farmers fully utilize digital innovations, there will be a spillover effect on smallholder farmers, as the innovations are better integrated into high-value crops. Continued investment in digital innovations and integration into the agricultural value chain is needed to ensure that everyone benefits.

Benjamin Addom argues that there is a strong divergence between "reach" (e.g. individuals having registered for a digital service) and actual "use" (individuals making regular use of the service). To further deepen such a realistic consideration, Peter Ballantyne notes that the exchanges have tended to move quite quickly to equate 'using' with 'benefitting'.

Moving forward

Sander Janssen summarizes that digitalization has the potential to benefit small-scale producers by providing access to information and market power. Access to information can help farmers innovate and strengthen their agency, while digital tools can provide insights into product and input prices, improving their negotiation position. However, digitalization faces structural problems such as lack of connectivity and digital literacy. To address these issues, solutions must be simple, user-centred, and designed to improve access to information in a rigorous way. Co-design approaches can ensure that digital solutions are built into the context of small-scale producers, finding what works best for them.

According to Jacob van Etten, in order to avoid / mitigate future situations where few players consolidate the market and farmers and their organizations lose market power, there is the "need [for] a critical look at the digital ecosystem (different digital services and how they interact) […] and invest in different things, for example:

1. Investments in integration -- standards development so that new players can easily come into the system;
2. Governance -- rules for digital business that limit the opportunities for strong monopolies to emerge, rules that oblige players to make their solutions as inclusive as possible;
3. Public digital infrastructures -- to create services where private players won't go.

Benjamin Addom concludes his contribution stating that there is the need to do more to actually measure the impact of digitalisation on small-scale producers.

Shared resources:

AECF. Undated. Pioneering AgTech solutions for smallholder farmers in Tanzania and beyond - The mFarming model. A case study of Sibesonke Ltd in Tanzania
AECF. Undated. Mobilising the private sector in the fight against counterfeit agro-inputs A case study of mPedigree in Tanzania
Paquette, D., Ontieri, E., Day, B., Schmidhuber, J. & Tripoli, M. 2023. Agricultural technology ecosystems in East Africa – Taking stock in Kenya, Rwanda, and Uganda. Rome, FAO.
Daniels, C., Erforth, B., & Teevan, C. (Eds.). (2022). Africa–Europe Cooperation and Digital Transformation (1st ed.). Routledge.
Banga, K., Gharib, M., Mendez-Parra, M and Macleod, J. (2021). E-commerce in Preferential Trade Agreements Implications for African Firms and the AfCFTA. ODI report. London.
Gouroubera, Moumounia , Okry, Idrissoua (2023) A holistic approach to understanding ICT implementation challenges in rural advisory services: lessons from using farmer learning videos The Journal of Agricultural Education and Extension
CTA repository of D4Ag/ICT4Ag related publications on CGSpace
CGSpace search results for the query "digital"

Below are some CGIAR outputs focusing on digital tool used by SSPs from the Inclusive Digital Tools Project (ATDT):
Reports:

- Global digital tool review for agroecological transitions [data]
- Improving rice sustainability through digital tools
- Principles for socially inclusive digital tools for smallholder farmers: A guide

Briefs:

Best practice guidance for inclusive digital tool development for sustainable rice in Vietnam
Critiques of digital tools in agriculture: Challenges and opportunities for using digital tools to scale agroecology by smallholders
Digital tools for climate change adaptation and mitigation
Exemplary features of digital tools for agroecology: A global review
Key actions to develop inclusive digital resources for smallholder cattle ranchers in Brazil
Socially inclusive digital tools for agriculture: A way forward