



Digital Agriculture Platform Blueprints

White Paper

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AGRIFIN

Dalberg

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- **DigiFarm:** Ann Kabukuru (www.safaricom.co.ke/digifarm)
- **FMN:** Shola Fashedemi (www.fmnplc.com)
- **Stanbic Bank:** Chane Hoogenhout, Mohamed Mubeen and Leandro Da Silva (www.stanbicbank.co.ug)
- **BK TechHouse:** Claude Munyangabo (www.bktechouse.rw)
- **Sterling Bank:** Bukola Awosanya and Ebenezer Bulowade (www.sterling.ng)
- **KALRO:** Boniface Akuku, Simon Mulwa, Allan Odwar and Irene Kimani (www.kalro.org)

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1. Executive Summary

The challenges in agriculture in Africa, particularly for the smallholder farmers producing 80% of its food for consumption, are complex, and no single solution exists to reverse age-old issues around markets, infrastructure, poverty and exclusion. These trends are now further compounded by increased competition over natural resources, massive urban migration and increasing climate-related shocks. Despite these trends, the effective application of digital technology has emerged as a catalytic tool in addressing market gaps and challenges faced in agriculture, including for smallholder farmers at the end of the last mile.

Agriculture is key to sub-Saharan Africa's economy, contributing to 15% GDP and employing over 50% of the population.¹ Systemic issues impact smallholder farmers livelihoods across market, land, skills and capital, with cross-cutting environmental sustainability and social inclusion issues for women. The 2019 study by CTA and Dalberg Advisors found nearly 400 different digital agriculture solutions working across the continent reaching 33 million registered farmers, pointing to the vibrancy and opportunity in the market.² However, many technology innovators face constraints across information, customer acquisition, relationships and access to finance that make it difficult to scale their solutions and be transformative in the market with viable business models.

Digital Agriculture Platforms (DAPs) are emerging as a scale vehicle for technology innovators across agriculture ecosystems that can help maximise impact, financial sustainability and outreach to different value chains and market segments. Digital platforms are best defined as systems and interfaces that form a commercial network or marketplace facilitating business-to-customer (B2B), business-to-customer (B2C) or even customer-to-customer (C2C) transactions. Typically, platforms are developed to serve or enable other products or services. In agriculture, platforms can tie together the wide array of actors needed to drive sustainable productivity and inclusion for the world's smallholders at the end of the last mile.

To better understand the potential for DAPs to be transformative in the agricultural sector, in this White Paper we explore leading DAPs in sub-Saharan Africa to develop understanding and early blueprints of how different platform models work and the impact they can deliver. While there can be many different types of platforms, we present four of the most prevalent DAP models in this paper, characterised by the type of organisation leading the platform, including telecommunications companies (telcos), agribusinesses, banks and government institutions.

The initial objectives, key assets and organisational culture of each platform typically impacts the platform's approach to product offerings, target customers and revenue models. The platform blueprints highlight common themes across products, customers, business model, capabilities, partnerships, and the enabling environment.

- **Customers:** Different segments of smallholder farmers and market stakeholders are more likely to interact with different types of platforms. The depth of farmer engagements in product and channel design varies across the platforms we reviewed, and those with deep farmer insights, quick customer feedback loops, a mix of technology and field force, as well as gender inclusive approaches have seen more success in driving uptake and usage

¹ World Bank Data Indicator on Agriculture and Employment, 2020

² The Digitalization of African Agriculture Report, 2019: <https://www.cta.int/en/digitalisation-agriculture-africa>

- **Products:** Platforms typically start with a small number of product offerings that tie into their key assets and existing core business. A farmer-centric mixed or bundled offering of products improves adoption as various products complement each other. User experience testing post-launch significantly increases the active use of products over time. Leveraging data intelligence from clients, platform and partner engagement also significantly enhances platform services.
- **Business Model:** DAPs tend to follow one of three business models depending on the organisation's drivers: (i) direct revenue driving, (ii) profit enhancing, or (iii) publicly funded. The choice of business models has strong implications on how platforms roll out products and what customer segments they tend to serve. Given increasing climate risks in agriculture, incorporation of services that build farmer resilience, such as crop insurance and smart farming advisory is an important approach in building platform viability
- **Capabilities:** Platform execution requires building a set of core capabilities internally across three interlinked components - people, processes, and technology - regardless of the core product or rollout plan. Each type of platform leader brings different strengths and is more likely to be challenged in a different area of execution and must invest accordingly
- **Partnerships:** Partners are core to the value of platform, and gain from the reach, economies of scale, networks and reputational association offered by a strong lead platform organisation. Platform partnerships tend to take two forms: implementing partners that support the delivery mechanism to farmers, and product partnerships that expand the platform's offering. In some cases, platforms partner with platforms (e.g. government and telco) to enhance offerings
- **Enabling Environment:** Government regulations can enable or restrict platform growth, whilst a strong digital infrastructure alongside access to finance, digital skills, literacy, and the density of innovators spurs platform adoption. Platforms scale faster in more mature agriculture markets with multiple potential partners and a more literate consumer base.

Digital Agriculture Platforms play a key role in addressing systemic issues for both smallholders and technology innovators around market access, access to information and capital. Platforms accelerate access to climate smart technologies and practices to directly improve farmer resilience and provide data-driven insights for decision makers to track mitigation and adaptation goals. Platforms help to improve gender equity by being intentional in the design, outreach and engagement of women, and in collecting gender-disaggregated data.

Based on the development of these emerging platform blueprints, we have developed recommendations to help platforms, regulators, investors and other market stakeholders seeking to increase the growth of these models. We also outline recommendations for tech innovators to engage with platforms to accelerate their own development. Finally, we offer key recommendations to maximise impact towards critical goals of climate resilience and gender equity.

2. About the Authors

2.1. About GIZ

As a service provider in the field of international cooperation for sustainable development and international education work, GIZ is dedicated to shaping a future worth living around the world. We have over 50 years of experience in a wide variety of areas, including economic development and employment promotion, energy and the environment, and peace and security. MakeIT in Africa is a pilot project forming part of the Digital Africa and MakeIT initiatives launched by the German Federal Ministry for Economic Cooperation and Development (BMZ). Working with the private sector, associations and social enterprises, MakeIT aims to utilise tech entrepreneurs' growth and employment potential in partner countries engaged in development cooperation with Germany. We are promoting the D4Ag Programme as part of the MakeIT in Africa project, to build a bridge between tech startup promotion and agricultural transformation in Africa to expand market opportunities, build capacities and facilitate co-operation.

2.2. About AgriFin

Mercy Corps' AgriFin programming (MCAF) represents USD 35 million in innovation funding from the Mastercard Foundation, Bill and Melinda Gates Foundation and the Swiss Development Corporation to support development, testing and scale of digitally-enabled services for smallholder farmers. Our objective is to develop sustainable services that increase farmer income and productivity by 50%, with 50% outreach to women.

MCAF works as an innovation partner with private sector scale partners and such as banks, mobile network operators, agribusinesses, as well as technology innovators and governments committed to serving smallholders at scale. We help our partners develop, test and scale bundles of digitally-enabled financial and non-financial services supporting partnership development between market actors that leverage their strengths. We combine MCAF team expertise with strategic subsidies to jointly implement iterative, fail-fast engagements with partners on a cost-share basis, sharing public learnings to drive market ecosystem growth.

Since 2015, we have completed more than 200 engagements with over 130 partners across Africa. With the onset of the Desert Locust in East Africa, the Skoll Foundation funded AgriFin's first emergency response work leveraging digital tools. With this support, AgriFin now reaches more than 16 million smallholders.

2.3. About Dalberg

Dalberg Advisors is a strategic advisory firm combining the best of private sector strategy skills and rigorous analytical capabilities with deep knowledge and networks across emerging and frontier markets. We work collaboratively across the public, private and philanthropic sectors to fuel inclusive growth and help clients achieve their goals.

Our businesses provide high-level strategic, policy and investment advice to the leadership of key institutions, corporations, and governments, working collaboratively to address pressing global problems and generate positive social impact. Dalberg was established in 2001. Today, we have over 20 offices worldwide.

3. Introduction

3.1. Background

Agriculture is key to sub-Saharan Africa's economy, contributing to 15% of gross domestic product (GDP) and employing over 50% of the population. Agricultural activities support livelihoods and drive social inclusion and are central to food security and nutrition efforts. The sector engages approximately 33 million smallholder farmers³ who contribute 80% of output in Sub-Saharan Africa.⁴

Smallholder farmers face systemic challenges around access to markets, low levels of skills, land use, and weak capital and infrastructure. Poor availability of quality inputs such as seeds and appropriate fertiliser, weak linkages to off-takers, and volatile prices driven by seasonality and middlemen can distort agricultural markets, lowering farmer productivity and incomes. Reliance on outdated productivity practices coupled with limited information sharing and entrepreneurial support systems result in skills and knowledge gaps. Land challenges include reduced land due to urbanisation, over-grazing and unsustainable farming practices, extreme weather events alongside inhibitive property rights. Finally, limited access to finance and fragmented supply chains reduces farmers' ability to invest in growing and distributing quality produce.

Furthermore, the agriculture sector faces challenges of environmental degradation and a lack of equal opportunities for women. Sub-Saharan Africa needs to reduce greenhouse gas emissions from agriculture (currently 60% of the region's total emissions), whilst protecting and restoring natural ecosystems and meeting the growing demand for nutritious food. Poor agriculture practices such as deforestation, overgrazing, monocropping, over-extraction of water and poor soil management contribute to land degradation, whilst chemicals and agricultural waste pollute fragile ecosystems. Women face lower levels of asset ownership and unequal access to agriculture products such as inputs, and technology enablers such as mobile phones. In sub-Saharan Africa, the 15% gender gap⁵ in mobile phone ownership limits women's access to financial services, markets, and training. Less than 9% of start-ups⁶ are led by women in the region, as women face barriers in leadership and a lack of support as entrepreneurs.

A 2019 study by CTA and Dalberg Advisors found nearly 400 different digital agriculture solutions working across the continent reaching 33 million registered farmers, pointing to the vibrancy and opportunity in the market.⁷ However, many technology innovators face constraints across information, customer acquisition, relationships and access to finance that make it difficult to scale their solutions and be transformative in the market with viable business models. Digital Agriculture Platforms (DAPs) are emerging as a scale vehicle for technology innovators across agriculture ecosystems that help to maximise impact, financial sustainability and outreach to different value chains and market segments. Digital platforms are best defined as systems and interfaces that form a commercial network or marketplace facilitating business-to-business (B2B), business-to-customer (B2C) or even customer-to-customer (C2C) transactions. Typically,

³ Steve Wiggins and Sharada Keats, 'Leaping and learning: linking smallholders to markets', 2013

⁴ Antonaci L, Demeke M, Vezzani A. The challenges of managing agricultural price and production risks in sub-Saharan Africa

⁵GSMA, The Mobile Gender Gap Report, 2019

⁶ UN, [Women-led tech startups on the rise in Africa](#), 2018

⁷ The Digitalization of African Agriculture Report, 2019: <https://www.cta.int/en/digitalisation-agriculture-africa>

platforms are developed to serve or enable other products or services. In agriculture, platforms tie together the wide array of actors needed to drive sustainable productivity and inclusion for the world's smallholders at the end of the last mile.

Emerging digital innovations across market access, land, skills, finance, and infrastructure hold the potential to tackle these challenges whilst building smallholder livelihoods. Key innovations in Africa span a number of areas, including:

Market access innovations



- **SaaS market information solutions** such as for prices, supply quantities and access routes
- **Digital marketplaces** to connect smallholder farmers to potential buyers
- **Online markets** with real-time, digitised stock control systems

Land related innovations



- **Climate smart technologies** such as soil testing and solar water pumps help farmers to become more resilient to the impacts of climate change
- **Regenerative agriculture** and sustainable agriculture practices supported through digital networks
- **Satellite and sensor mapping** of weather and soil to inform planting decisions and land allocation

Skills development innovations



- **eLearning platforms** to deliver training on improved agronomic practices and increase farmers' efficiency through SMS, chatbots and online channels
- **Advisory platforms** to support entrepreneurial and business management
- **Women-targeted content** to engage women and close the gender gap

Capital and infrastructure innovations



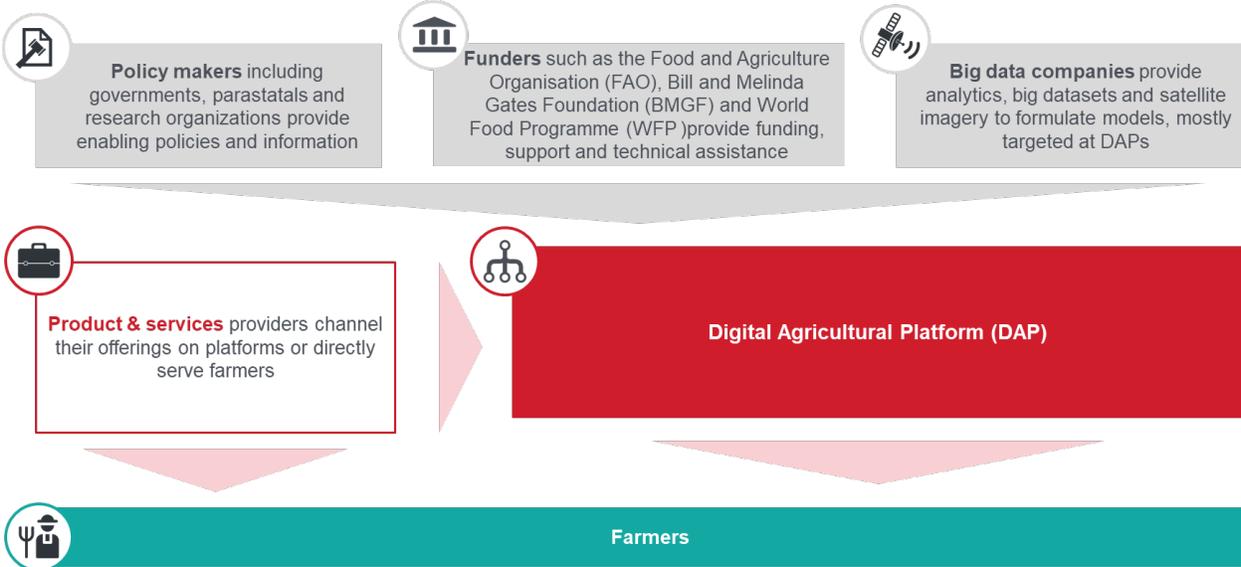
- **Financial services** such as input loans, crowd-sourced investments, mobile money payments, savings products, payment wallets to provide working and growth capital
- **Digital traceability** and supply chain management technology such as GPS/geo-tagging, QR codes and contactless delivery signing to map distribution networks
- **eLogistics platforms** and **digitised mechanisation** services such as fleet management or equipment rental through platforms to increase access to quality machinery and efficiently transport goods among value chain players and consumers

Technology and digital innovators often lack the information, relationships, economies of scale, customers and access to finance to expand their business. New innovators lack information and data from the field to inform their decision making and product development. They face high agricultural sector risks and costs of customer acquisition in establishing new field

networks and building farmer outreach and lack the established networks and relationships to build outreach to potential partners and policy makers. Finally, tech innovators face challenges in accessing investment capital alongside cashflow constraints as they scale, particularly if they seek to scale a single innovative product or solution on its' own.

Emerging DAP models help to address these challenges for technology innovators, acting as a single interface between farmers and other players in the digital ecosystem. DAPs leverage technology, brand and scaled outreach to bundle complementary products and services across the agricultural value chain. Platforms range from simple bundles of services targeting farmers to full end-to-end services. DAPs are commonly run by organizations with strong presence in agriculture value chains or scaled digital platforms that move communications, funding and data, including banks, government institutions, and telcos.

Figure 1: DAPs in the agriculture ecosystem



Innovators face challenges in aligning on ways of working and the terms of engagement with platforms, from pre-partnership talks through to project execution. Before partnership and in exploration phases, innovators and platforms may have divergent priorities. In partnership discussions, innovators face challenges related to both the process and negotiation terms. As innovators work with platform partners, they can encounter unclear roles and responsibilities, a shifting scope of work, and reduced customer engagement. We explore these challenges in greater depth and how innovators can get the best out of their platform partners in section 6.

3.2. About this report

In early 2020, GIZ engaged with Mercy Corps AgriFin to understand how young technology innovators across Africa can be supported in scale, impact and operational viability by engaging with emerging models of digital platforms.

To achieve this, GIZ initiated a **Digital Agriculture Platforms (DAP)** programme, a six-month initiative to work with jointly identified platform partners in Kenya and Nigeria to explore and gain insights into the key operational dynamics of emerging digital platforms for agriculture and present related learning to public audiences to drive ecosystem change.

To develop this DAP White Paper, GIZ, Mercy Corps AgriFin and Dalberg used a combination of research methods:

- Desk-based research
- Direct learning engagements with three leading DAPs to build partnerships with tech innovators
- Analysis of work from more than 30 previous engagements with DAPs and tech innovators
- Virtual interviews with 40+ companies.

This work has culminated in the production of the DAP White Paper and a series of blogs on target issues, which can all be accessed on the Mercy Corps AgriFin website at www.mercycorpsagrifin.org

4. Digital Agriculture Platforms

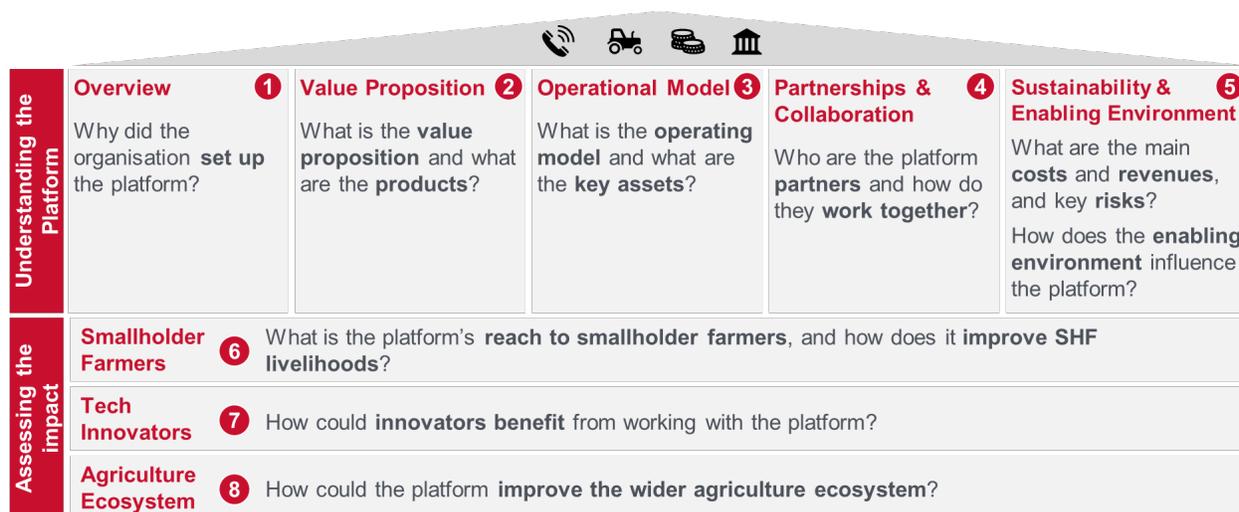
Digital Agriculture Platforms help to solve the issues of scale, accessibility and viability of digital innovations by bringing together smallholder farmers, partners, funders and policy makers. DAPs provide governments with data to drive agricultural policy making and programming. For funders and investors, they create opportunities to fund combinations of actors, driving high impact bundles of services and large-scale initiatives in agriculture. For partners – including tech innovators – DAPs provide access to a large market to scale up, as well as access to strong existing technology, diverse services, data capabilities and trusted brands. Finally, DAPs offer smallholder farmers access to a wide range of digitally enabled products and services that help to improve productivity and incomes, while helping farmers build digital identities and financial inclusion

We examined four different models of emerging DAPs led by telecommunications companies (telcos), agribusinesses, banks and government institutions as some of the most developed in the market. Whilst new models continue to emerge, these four platform models were chosen for analysis due to their higher development and deployment across Africa, their varied interactions with tech innovators, and their historical relationship with GIZ, Mercy Corps AgriFin, and Dalberg.

-  • **Telco: Safaricom’s DigiFarm** service
-  • **Agribusiness: Flour Mills of Nigeria (FMN)**, with supporting insights from Twiga
-  • **Banks: Stanbic Bank, Sterling Bank and Bank of Kigali TecHouse**
-  • **Government: Kenya Agricultural Research and Livestock Organisation (KALRO)**, with supporting insights from the Ethiopian Agricultural Transformation Agency (ATA) and the National Potato Council of Kenya (NPCK)

We examined each platform against eight key areas to understand core platform characteristics and potential areas for impact.

Figure 2: DAP Framework



4.1. Telco-Led – Safaricom’s DigiFarm Service (Kenya)



1. Overview

DigiFarm was founded in 2017 as Safaricom's integrated mobile-based platform that supports smallholder farmer through partnerships and digital products that help to increase their productivity and income. Safaricom is the leading telecommunications company in Kenya providing a broad range of products and services for telephony, broadband internet, and financial services with more than 64% market share in mobile subscriptions⁸ and 30 million customers.⁹ Safaricom's main drivers to create the platform were to continue to build its footprint as a digital company across its core communications, data and mobile money services and to enhance customer value proposition and loyalty in rural areas. Additionally, they wanted to draw new customers onto the Safaricom network and widen the customer base to increase profits. The platform was also built to leverage brand awareness beyond telephony and its’ ubiquitous M-Pesa mobile money service, merchant and agent network, particularly in rural areas. M-Pesa dominates the mobile money field in Kenya with a 99% share in mobile money subscriptions and almost 200,000 agents.¹⁰

2. Value Proposition

DigiFarm's platform model opens the marketplace for small scale farmers to access products and services from financial institutions, agri-input providers, and other value-added service firms, enabling farmers to easily source, transact, learn, connect to markets and grow. The platform's initial product offer included access to inputs and information and advisory services. Over the past four years, DigiFarm has widened its value proposition with additional products such as credit, insurance, aggregation & delivery, enterprise products, market access, and most recently, government e-subsidies.

Figure 3: DigiFarm value proposition and products

Stakeholders	Value Proposition	Products
1 Agro-dealers	<ul style="list-style-type: none"> Access to customers within the DigiFarm network Produce and inventory tracking 	Inputs
2 Government	<ul style="list-style-type: none"> Access to farmers Efficiency gains in subsidies allocation 	E-subsidy
3 Farmers	<ul style="list-style-type: none"> Access to products and services that help to raise productivity and boost incomes Farmers can source for inputs, transact, learn, and grow their farms from a 'one-stop-shop' platform 	Credit
4 Enterprises	<ul style="list-style-type: none"> Access to products and services that help to raise their farmers' productivity and incomes 	Learning & information
5 Offtakers	<ul style="list-style-type: none"> Access to customers within the DigiFarm network Improve quality of produce for offtake 	Insurance
		Aggregation & delivery
		Enterprise product
		Market access

⁸ Communications Authority of Kenya, “Sector Statistics Report Q4 2019-2020”, 2020

⁹ Safaricom Press Release, 2019

¹⁰ Communications Authority of Kenya, “Sector Statistics Report Q4 2019-2020”, 2020

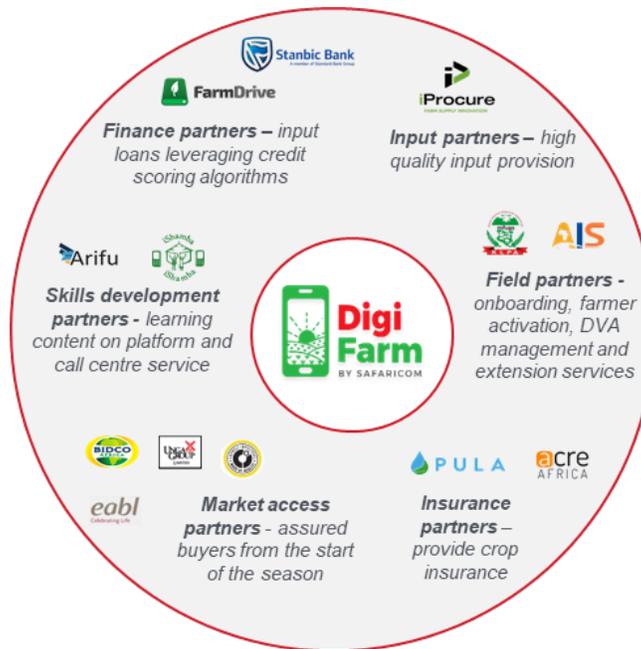
3. Operational Model

Users access DigiFarm using USSD functionality for 2G phones, with Android App and WhatsApp services forthcoming. The platform is resourced with a team of dedicated specialists and leverages the world-class technology and corporate support teams within Safaricom. Field agents, managed by implementing partners, provide on the ground support to strengthen digital interactions with farmers. Safaricom's digital and telecommunications assets (including M-Pesa) enable DigiFarm to create digital products such as information and advisory services and push information out to farmers, making it cheaper to reach users. In 2020, DigiFarm became an independent social enterprise in order to drive deeper focus on its agricultural business, while still leveraging Safaricom technology assets, networks and expertise.

4. Partnerships & Collaboration

Since its inception, DigiFarm has pursued partnerships with product providers and implementing partners that complement internal capabilities to offer value to farmers. Product partners including input sellers (iProcure), information and advisory providers (Arifu, iShamba, iCow), insurance companies (Pula, Acre), financial institutions (FarmDrive, Stanbic Bank), and market access providers (Bidco, Unga Group, Eabl) help to expand new offerings to farmers. While the first iterations of the product were purely available on mobile phone, later interactions of DigiFarm including links to buyers and a digitally enabled field force of DigiFarm Village Advisors (DVA). New implementing partners including Africa Instore Solutions (AIS) and Kenya Livestock Producers Association (KLPA) manage the network on the field, leveraging the CropIn application to support their work. DigiFarm pursues bilateral and non-exclusive arrangements and takes a decision-making role in partnership direction and user engagement. The platform prefers building revenue-sharing models, whereby partners give DigiFarm a percentage of the revenue made through the platform, over payment-for-services upfront. Partners that offer interesting content that encourages frequent smallholder farmers engagement could be offered a data or content sharing model.

Figure 4: DigiFarm partnerships

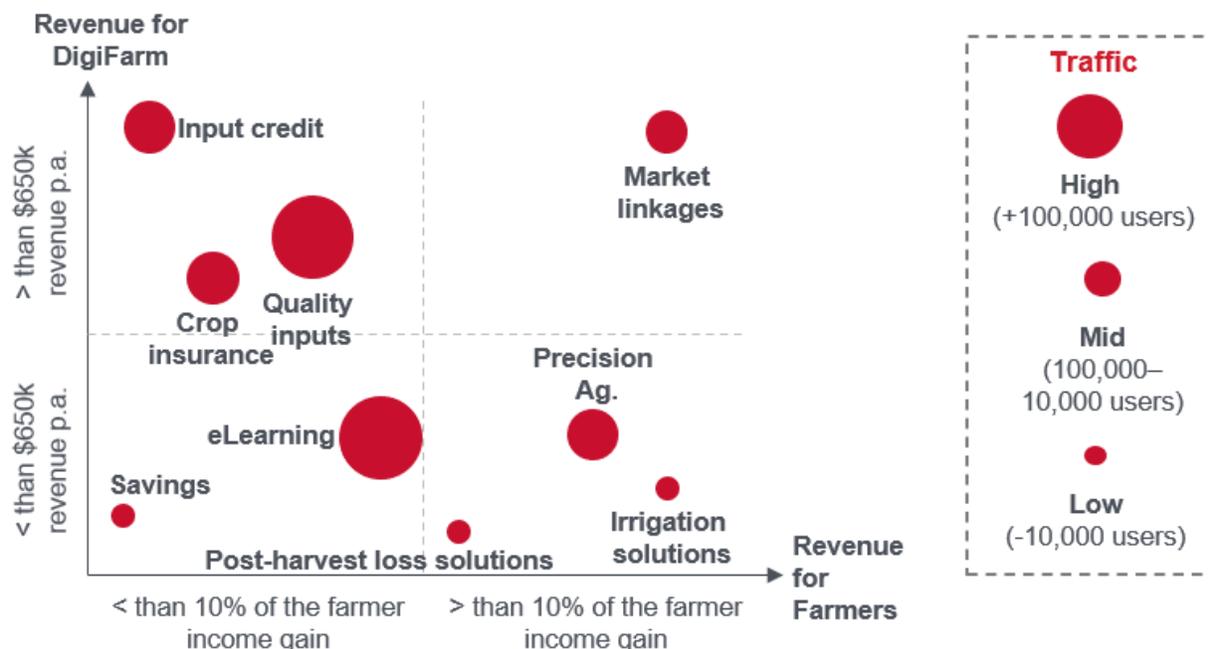


5. Sustainability & Enabling Environment

From an initial focus on onboarding farmers and building traffic through information and advisory services, DigiFarm increasingly looks to cross-sell farmers onto revenue-generating products, including inputs, market access and financial services. The primary revenue streams are market facilitation and input sales transaction fees, whilst 50% of costs relate to farmer engagement. DigiFarm’s gross margin is not yet positive and it is one of their key deliverables this year. They are targeting 2023 for break-even. DigiFarm faces risks including COVID-19, alignment across Safaricom, and high investment in logistics. Market price volatility is a risk as some off-takers default on their commitment to buy when market prices fall, which has necessitated engagement with crop insurance partners.

DigiFarm has capitalised on Kenya's digital infrastructure, including high mobile penetration and the strong M-Pesa mobile money ecosystem. A lack of diverse options in the agriculture market meant that Safaricom started DigiFarm from scratch, rather than acquiring an existing player. However, they have since forged partnerships with entrepreneurs in the growing agriculture ecosystem.

Figure 5: DigiFarm revenue, farmers income & traffic



6. Impact on Smallholder Farmers

DigiFarm has more than 1.3 million farmers subscribed and 340,000 active users, a presence in over 12 counties in Kenya across five value chains, with more than 67,000 processed loans and 2,346 million tonnes produced. Recent AgriFin-Digifarm studies have found that half of the active users are women smallholders.

7. Impact on Tech Innovators

DigiFarm helps tech innovators to improve their reach, economies of scale, profitability and potential for investment. – DigiFarm’s main input provider, iProcure, has expanded from 20 to 1,200 agro-dealers since 2017 and aims to reach four times as many agro-dealers by 2023 using DigiFarm's network. DigiFarm also enables tech innovators to access digital payment channels, lower communications costs, and increased farmer data through the DVA field force, and the network effects of improved consolidation as the platform grows.

8. Impact on Agriculture Ecosystem

At an ecosystem level, the platform contributes to increased farmer engagement, data, and transparency across the agriculture sector to help drive investment, more efficient markets, and enhanced food security. A recent AgriFin-Dalberg study of gender impacts of DigiFarm indicates that women are able to increase income, productivity, and household nutrition. DigiFarm takes advantage of 50% gender inclusion rates on M-Pesa mobile money to make the solution more valuable and accessible for women. DigiFarm is also improving the efficiencies and lowering the costs of subsidies distribution by partnering with the Ministry of Agriculture to provide e-subsidies to farmers through the platform. DigiFarm also has a positive impact on implementing partners such as AIS and KLPA, that become more tech-savvy and digitally enabled by partnering with the platform.

4.2. Agribusiness- Led – Flour Mills of Nigeria and Twiga (Kenya)

1. Overview

FMN's platform is being developed by its subsidiary GAIL (Golden Allied Industries Limited) who aims to increase input sales by offering productivity advice to farmers. FMN is one of Nigeria's leading agro-allied companies, operating in agriculture, livestock feed and pasta manufacturing with more than 5,000 employees and USD 1.5 billion revenue per year.¹¹ The main drivers to create the FMN platform are to expand and strengthen the existing agribusiness. FMN aims to increase the inputs sold by connecting new farmers to FMN's agro-dealers network, and to improve the quality and quantity of produce for off-take.

Twiga runs a mobile-based B2B food supply platform that supplies fresh fruits and vegetables sourced from farmers in rural Kenya to small- and medium-sized vendors, outlets and kiosks in the country's capital, Nairobi. The mobile-based cashless platform allows Twiga Foods to offer higher prices and a guaranteed market to farmers, and lower prices and a reliable supply to vendors.

2. Value Proposition

The FMN platform offers farmers access to quality inputs and advisory services to increase their productivity. Farmers will improve productivity based on an assessment, learning information, and agronomist advice alongside a platform providing access to inputs, seeds, and fertilisers and links to market at a competitive price. FMN is developing three features in the initial product offer, including a customised productivity report, matching service with the agronomist and connection with agro-dealers. FMN will extend to additional products including market access that provides farmers with direct linkages to FMN's offtake activities, and various credit solutions through financial service providers for input financing and other crop management related costs. By offering these services FMN intends to build loyalty and a strategic supply chain from smallholder farmers to ensure continued supply to its manufacturing arms in the face of growing competition from other agribusinesses.

Figure 6: FMN value proposition and products

Stakeholders	Value Proposition	Products
1 Farmers	<ul style="list-style-type: none"> Improve productivity based on an assessment and agronomist advice 	Products in development
		Customised productivity report
		Matching service to Agronomist
2 Agrodealers	<ul style="list-style-type: none"> Access to farmers within the FMN network Inventory management and supply availability of FMN (GAIL) products in each location 	Connection with Agrodealer
		Products under consideration
3 FMN	<ul style="list-style-type: none"> Manage its supply and manage SHF market channels Improve quality of produce for off-take 	Learning content
		Mapping farmers produce
		Market access
		Potential future products
		Credit

¹¹ FMN, "Annual Report", 2020

3. Operational model

FMN's platform is built into the core business and largely uses existing teams, technology, and processes. This is similar to other agribusiness platforms such as Twiga, which has an in-house platform for managing farmer offtake. The platform will use FMN's current technology provider in part to streamline with the IT systems used in the rest of the organisation, with some customisation. GAIL's management team is leading on platform design and implementation, in consultation with the central FMN tech team. As the platform is still in design, the product roadmap and long-term engagement strategy are not yet defined. However, initial rollout will be through FMN agronomists to existing farm input customers. FMN has significant market buying power and brand recognition among farmers stemming from FMN's scale of operations to develop the platform, and established relationships with farmers from years of field operations in input provision.

4. Partnerships & Collaboration

FMN plans to partner with organisations that can offer products to expand their platform capabilities, and with implementation partners that can boost their channels to local network organisations and new farmers. FMN is piloting relationships with product partners to provide real-time data and support production. For example, AgroMall, a digitally enabled extension provider that works with 526 FMN farmers to improve their production through the growth cycle, collecting digital information to track individual farmer performance. AgroMall has deployed over 100 extension service providers to FMN farmers and currently reaches 200 farmers, of which 50% are female. FMN is also piloting Ignitia's weather information service to provide farmers with information such as optimal planting dates, fertiliser application and general crop management.

Future potential partners include insurance providers (Pula, Acres, Royal Exchange) and aggregation providers (Thrive). Current field organisation partners could also digitise their operations and come onboard to the platform for more efficient interactions with GAIL. Partnership selection and approach is not yet defined as the platform is still in development but is expected to follow the general process FMN applies to all. This can be lengthy and resets every season, which can prove challenging for partners.

Figure 7: FMN partnerships



5. Sustainability & Enabling Environment

FMN has integrated the platform into GAIL’s core business; there is no standalone profit & loss statement, and the business internalises all costs and revenues as part of regular operations. GAIL’s core revenues come from input sales to farmers and the platform should result in higher sales and more efficient operations. Thus, the platform is financed internally with no direct revenues initially. The same is true for Twiga’s platform. The cost drivers are technology development and management, hiring expertise, training, field force, and logistics. Since the platform is in the design stage, these costs are not yet quantified. Risks come from the digital solution, which sits on an existing platform with limited flexibility for customisation, so they might have limited ability to tailor technology design for customers. A lack of end-user engagement and low levels of digital literacy are additional risks that the platform faces.

Nigeria's mature agriculture sector provides FMN with a variety of potential product partners and farmer networks to scale the platform. The presence of tech innovators provides a wide variety of potential partners for FMN. In Kenya, fragmented producers and buyer dynamics has enabled the growth of Twiga’s digital platform and logistics network, which links smallholder farmers produce to urban retailers and consumers.

6. Impact on Smallholder Farmers

FMN's target is to reach 150,000 farmers by 2021. Since the platform is still in development, its impact on smallholder farmers, tech innovators, and the ecosystem is still unproven. Farmers could gain through the customised productivity reports, agronomist advice and learning content, and the access to quality inputs. Ultimately, FMN and Twiga’s platforms can help to improve farmer productivity and incomes, and the platform links farmers to a guaranteed buyer for their produce.

7. Impact on Tech Innovators

For tech innovators, FMN provides direct inroads to a target market and a vast network of farmers. Working with FMN sends a reputational signal to the market that innovators have a strong proof of concept and are competitively positioned to operate at scale. FMN has relationships with other actors that can support innovators to engage with other actors in the field to expand their work.

8. Impact on Agriculture Ecosystem

At an ecosystem level, the platform could help implementing partners without tech skills to become more tech-savvy and digitally enabled. FMN customers will also have access to better quality products and can help to enhance food security. In the future, FMN's platform has the potential to work with the government to inform agriculture data about production volumes and yields by location, informing resource allocation towards local food production, value chain promotion, and food security.

4.3. Bank-Led – Stanbic Bank (Uganda), Sterling Bank (Nigeria), Bank of Kigali (Rwanda)

1. Overview

Banks create digital agricultural platforms to expand their customer base to unbanked and underserved farmers, tap into new revenue streams by facilitating agricultural transactions, and lead the market in financial innovation, with a strong view into mobilizing deposits and serving corporate agribusinesses upstream and other clients along agricultural value chains.

This study examined four banks and their respective platforms:

- 
• **Stanbic Bank, Uganda**, is developing OneFarm, a network of digital solutions to provide lending, insurance, market linkages, and agronomic services to smallholder farmers
- 
• **Sterling Bank, Nigeria**, has two block-chain enabled solutions. SABEX 1 caters to agro-dealers with input provision and credit. SABEX 2 provides farmers with credit against harvests, market linkages, and warehouse storage services to reduce post-harvest losses
- 
• **Bank of Kigali TecHouse, Rwanda**, runs Smart Nkunganire System (SNS), which provides farmers and agro-dealers with government subsidised inputs, order processing for supply chain management, and financing

2. Value Proposition

Bank-led platforms enable farmers to invest in high quality products and services that improve their productivity and incomes. Anchoring the platform on payments, credit and savings services empowers farmers to access capital to purchase higher quality inputs, technologies, leverage the benefits of rural agent and ATM networks and agronomic support to improve their yields. Additional platform features such as logistics, insurance and market linkages enable farmers to secure better prices and grow their incomes.

Figure 8: Banks value proposition and products

Stakeholder	Value Proposition	Products		Implementing banks
1 Farmers	<ul style="list-style-type: none"> Financial products to invest in farming activities Bundled value-add services to increase productivity and incomes 	Credit	Tailored loan products based on their needs and platform usage to invest in quality products and services	  
		Savings	Savings accounts and support for farmers to earn interest and save for the future	
		Input provision	High quality inputs distributed to farmers and local resellers to increase farmers' productivity and yield	  
		Learning and information	Digital content to upskill farmers with good agronomic practices, often supplemented by field agents	 
2 Agro-dealers*	<ul style="list-style-type: none"> Financial products to procure stock Supply chain management solutions 	Market access	Market linkages between farmers and end consumers or off-takers, removing intermediaries and increasing farmer income	 
		Logistics and warehousing	Transports inputs/harvests from producers to markets, and/or stores goods so farmers can get better prices at later dates	 
		Insurance	Subsidised agri-insurance, sometimes in partnership with insurers or tech innovators, to protect farmers from harvest loss	

KEY: ■ Primary product ■ Additional products

Banks lead with credit and/or a savings products as their core offering, adding a combination of supplementary products as the platform develops

3. Operational Model

Banks often aim to keep the bulk of their operations in-house to maintain oversight and minimise risks. They prefer to develop their platforms to retain control, using in-house teams to run and maintain the technology. Their incubation arms or separate dedicated business units have more flexibility to deviate from central organisation policies, procedures and targets. For example, BK TechHouse runs as a separate entity within BK Group, and Sterling manages SABEX within its agriculture department. Banks typically rely on channel partners for field operations, rather than focusing on direct client acquisition, in some cases supplementing partners' field networks with their rural agents and branch networks.

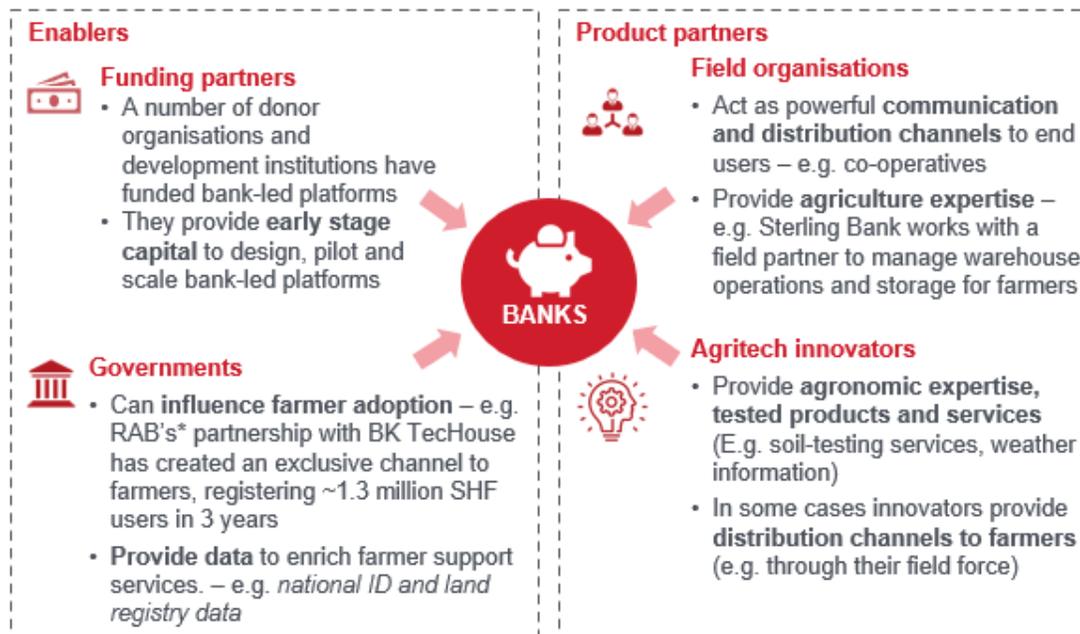
Banks' established relationships with agriculture ecosystem actors and data on their financial needs help them build partnerships and design products. Progressively, banks are looking to credit scoring and other uses of digital data to establish farmer identity and manage risks. Agriculture-specific strategies provide organisational alignment, and their financial resources to invest in strategic initiatives provide capital to run the platform. In some cases, banks will partner with other platforms (MNOs, agribusinesses, etc) to gather digital data and extend financial services to farmers.

4. Partnerships & Collaboration

Banks work with product partners such as tech innovators and field organizations to leverage their agronomic expertise and channels to farmers. AFEX provides warehouse and storage services to Sterling's SABEX 2 platform, while Stanbic leans on field organizations to connect with farmer groups and run pilots.

Banks also work with enabling partners, such as donors for early-stage capital, or governments for data, state-backed voucher schemes and farmer channels. Banks' risk aversion extends to their partnership approach, often choosing to explore multiple partners to reduce reliance on just one player and building closer relationships with government due to heavy industry regulations, often requiring significant time and due diligence to finalize partnerships. Banks explore varied partnership models such as revenue sharing and purchase agreements, as well as building financial services for farmers into supply chain support for corporate clients.

Figure 9: Banks partnerships



5. Sustainability & Enabling Environment

Bank-led platforms' main revenue drivers are returns from financial products in the form of loan repayments, savings deposits, and transaction fees, often reinforced by insurance. Their main costs are set-up and operational expenses covering technology costs, loan processing fees, field operations, and marketing. Bank-led platforms face four key risks:

- Slow development due to risk aversion could delay market entry and development, leading to low market share and scalability
- High default rates from credit risks such as misapplication of cash loans or poor data resulting in misinformed loan approvals
- Over-reliance on channel partners could lower banks' ability to control their customer relationships such that disengagements with partners weaken a bank's touchpoints to end users
- Low digital adoption and literacy among farmers could lead to low adoption and engagement, depending on the market.

Government involvement varies by market and can serve as a strong enabler when partnering with banks – or as a barrier in markets with high regulation. For example, BK TechHouse's partnership with Rwanda Agriculture Board (RAB) has enabled nationwide adoption of their e-subsidy product in Rwanda. Bank-led platforms benefit from high levels of digital innovation and established digital infrastructure, along with established agriculture entrepreneurs who serve as potential partners. Sterling's SABEX 2 leverages blockchain technology to facilitate loans and trades of produce in under ten minutes.

6. Impact on Smallholder Farmers

Farmers could benefit from improved financial literacy and access to finance. Credit products enable farmers to invest in higher quality products and services for their farms, leading to improved productivity and increased incomes; savings products help farmers to safeguard earnings and

invest in the future. Farmers could also benefit from learning good agricultural practices to improve their productivity, and more favourable prices through features such as market linkages and access to storage. Zanaco Bank in Zambia, for example, designed its AgriPay product to be gender inclusive and has achieved strong results in delivering this new service both to women and men in rural areas.

7. Impact on Tech Innovators

Tech innovators who partner with banks can gain from wider customer reach, links to agent banking and ATM networks, competitive financing, links into robust technology and positive brand association. They could also lean on banks’ strict due diligence procedures, client protection standards and ability to process data for credit scoring when evaluating potential customers to reduce their exposure to risk.

8. Impact on Agriculture Ecosystem

For the ecosystem at large, banks’ entry into digital agriculture could increase much needed financing to the agricultural sector, as well as send market signals that attract additional investment into technology innovators and smallholders, increase market competition by meeting financial needs across the supply chain. Banks also have close relationship with government and can support government and donor resource allocation and decision making through data sharing (e.g. banks could offer information that identifies financially underserved farmer segments and enables governments to target them).

4.4. Government-Led – KALRO (Kenya), NPCK (Kenya) and ATA (Ethiopia)



1. Overview

Kenya Agricultural and Livestock Research Organisation (KALRO)’s datahub centralises research data as a freely accessible resource to improve farmer livelihoods and inform decision making among ecosystem actors. KALRO is a quasi-public research body that coordinates and oversees agricultural research in Kenya with more than 300 agronomists on staff. KALRO provides agricultural resources on its’ website and Android apps and launched its agricultural datahub in 2019 to fulfil its public mandate through research and knowledge building, to foster innovation by sharing open information in the ecosystem, and to establish itself as a digital player driving transformation.

The National Potato Council of Kenya (NPCK)’s Viazi Soko platform provides seeds, market linkages, and information exchanges for potato value chain actors with plans to expand into digitized extension, aggregation, and logistics. The Agricultural Transformation Agency (ATA) is a government agency pioneering multiple digital agriculture projects in Ethiopia with outreach to more than 5 million farmers.

2. Value Proposition

The datahub offers a suite of eight open source digital products that cater to ecosystem actors, field organisations and farmers, and financial service providers by packaging data insights in ways that easily translate to their needs. Ecosystem actors (e.g. donors and governments) receive verified field data to inform planning and improve insights from existing models. Field organizations (e.g.

tech innovators and research organizations) and farmers get agronomic information to increase farmer productivity and improve their incomes. Financial service providers (e.g. banks and insurance companies) receive aggregated farmer data to inform loan decisions and insurance pay-outs.

Figure 10: KALRO value proposition and products

Stakeholders	Value Proposition	Products	
1 Ecosystem actors (e.g. policy makers, donors, satellite companies)	Accurate field data to inform national planning, program development, and help improve the range of insights from existing models	Food balance sheet (FBS)	Tracks Kenya's food supply and demand, incorporating yield estimates for planning
		Livestock/crop suitability mapping	Maps areas that are suited to specific crops and livestock
		Modelling environmental changes	Models climate change effects on agricultural ecosystems
2 Field and farm (e.g. tech innovators, research organisations, farmers)	Actionable agronomic information for farmers - and field organisations to share with farmers - to increase productivity and improve incomes	Early warning alert	Signals impending disasters, food market interruptions, and their expected scale
		Weather/crop monitoring	Provides weather forecasts and agronomic advice to farmers based on crop and location
		Livestock/crop selector	Advises farmers on crop and livestock breeds based on map suitability
3 Financial service providers (e.g. banks, insurance companies)	Data on farmers and farming activity to inform loan decisions	Agri-coach	Advises farmers on the whole value chain, building on inputs from other digital products
		Credit scoring	Assigns credit scores to farmers to access credit, leveraging agri-coach metrics

3. Operational Model

The platform is a publicly funded, open source datahub that convenes partners to create and distribute free digital products, leveraging the ongoing work of KALRO in agricultural best practice for Kenya. KALRO built in-house big-data technology infrastructure, financed by the World Bank, and working in active collaboration with other government bodies across Africa to develop data sharing standards. KALRO's field force and partner network provide critical data inputs, which the IT team uses to create the analytical models that power the digital products. Partners include satellite companies, governments, and field organisations; they provide geospatial data, land mapping, field data, food production data and other inputs. Some field partners will channel digital products to farmers, supplementing KALRO's direct link to 80,000 farmers. KALRO is working to build a database of geotagging information on Kenya's smallholders to inform delivery of precision agricultural advisory via its partners, but is yet to refine its plans to market and distribute digital products to farmers directly.

KALRO's wealth of agricultural research information, field agronomists, data on more than 80,000 farmers, dedicated IT team, and established infrastructure are highly valuable assets that lay a strong foundation for the datahub. KALRO also has trusted relationships and reputation with ecosystem actors, including being the primary research advisor to the Ministry of Agriculture.

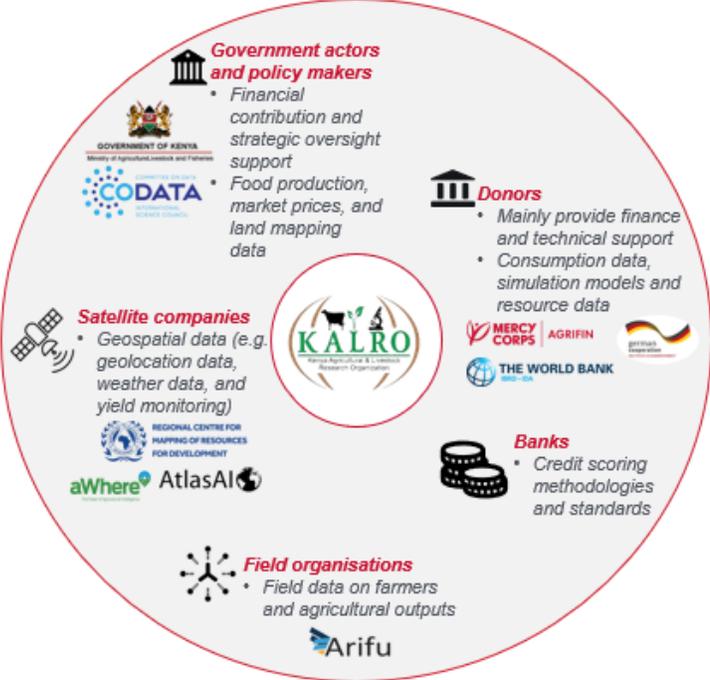
ATA Ethiopia presents an alternative operating model among government-led platforms, working over the past ten years on project design and management, implementing projects through contracted services providers now reaching more than five million farmers with digital tools, including its' 8028 farmer hotline. ATA is also in the process of developing a data hub model, to allow its' accumulated data to benefit other ecosystem stakeholders in Ethiopia.

NPCK operates through a field force of young agents who obtain and verify more granular data on farmers without smartphones. The youth field force is critical to scaling the platform and sustaining its growth by providing support services to registered farmers, and signing on new members workshops, trainings and conferences around the country. Currently, NPCK is relying on an outsourced consultant to develop Viazi Soko. They have a dedicated IT employee and expect to build an IT department to run and maintain the platform. NPCK intends to maintain internal oversight over the platform as it scales to have more visibility on data protection and data security.

4. Partnerships & Collaborations

KALRO follows a wide net approach to building partnerships, formalising them through non-exclusive, bilateral, data sharing agreements. Government actors and policy makers provide finance, strategic oversight support, and field data. Donors provide finance and technical support; satellite companies provide geospatial data. Field organizations provide field data on farmers and agricultural outputs. Some partners will provide direct farmer channels to distribute digital products. All partners benefit from open access to the datahub's information. KALRO itself is highly dependent on government budget and donor funding, given its' lack of direct revenue generation against digital services to date.

Figure 11: KALRO partnerships



Partnership modalities differ among government-led platforms. KALRO relies heavily on field partnerships, NPCK leans on product and service providers to enrich their offerings to value chain actors, and ATA works with contracted service providers. Government platforms enjoy a strong position in terms of generation and use of digital data across agricultural use cases and again, have been able to partner with other platforms for scale, such as the KALRO DigiFarm collaboration in Kenya.

5. Sustainability & Enabling Environment

The government budget, financing and partner contributions sustain KALRO's data-driven advisory services, which has no short-term plans to generate revenue. The platform's main costs are operational expenses on the team, technology maintenance, and field activities. Currently, strong leadership and robust IT capabilities offer a solid foundation for growth, however the hub faces risks including:

- Low internal capacity from a small team running the operations constrains KALRO's ability to scale its partner outreach and datahub development

- High-quality research skills preservation. Given that a significant number of senior researchers in the government and higher education sectors are nearing retirement age, it is crucial to avoid losing research capacity and maintain high-quality research skills
- Limited funding. Given declining government funding and the government’s reallocation of commodity-levy funding to non-research related activities, KALRO was forced to use reserve funding during 2015–2017 to meet its expenses
- Lack of a data sharing and purchasing policy determining if KALRO is prepared to pay for data inputs, how it would source funds, and how the purchased data would be openly shared with others

KALRO’s position with government as a research authority and valuable partner enhances its ability to attract collaborators. Strong connectivity and digital infrastructure in Kenya provide channels to create and distribute products to farmers. The agriculture sector holds a number of players for potential partnership, but also some with competing offerings.

Markets with strong government involvement are likely to see government-led platforms being first movers. The Agricultural Transformation Agency (ATA) was Ethiopia’s first agriculture hotline, supporting smallholder farmers with real-time agronomic information and best practices.

6. Impact on Smallholder Farmers

Farmers are able to improve their productivity through information on better agricultural practices, including livestock or crop suitability and early weather warnings. They could also improve their income security and benefit from more stable commodity markets due to better government policies on food production, informed by the food balance sheet. Farmers could also receive access to finance through credit scoring.

7. Impact on Tech Innovators

KALRO is still in the early stages of partner engagement, with some agreements approved and others underway. Innovators working with KALRO could gain access to rich data analytics to strengthen their own products, gain credibility through working with government, broaden their networks to other actors in the datahub, and provide farmer networks more value by passing on KALRO products.

8. Impact on Agriculture Ecosystem

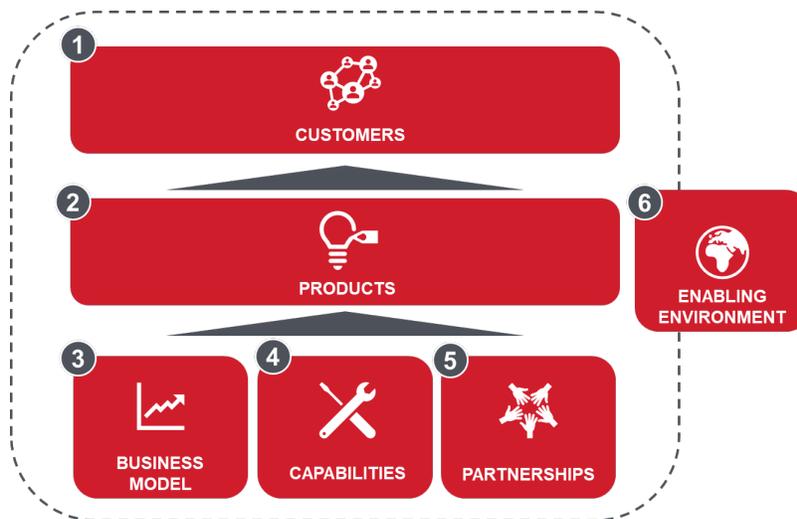
KALRO’s precision agronomic advisory services, which are available to any organisation in Kenya, can be a strong driver of agricultural and digital sector growth, provided that KALRO is able to empower partners to provide its’ services at scale. Both the KALRO platform and the work of ATA in Ethiopia is expected to further enable data-driven decisions, leading to stronger government policies on food security, improved resource allocation among donors and public actors, as well as more cohesive data sharing to promote collaboration in the ecosystem.

5. Key Findings & Recommendations

A DAP's key assets, competencies and initial drivers – their core business or mandate, and why they decide to develop a platform to serve smallholder farmers – shape a large part of platform's product offerings and its sequencing, business model, and core target customer segments. As the above sections describe, platforms take a diverse range of shapes. Product mix, business model and target customers, coupled with organisational culture, are key factors that influence how platforms develop core capabilities and the partnerships required for operations. The enabling environment of the market influences the speed of growth, types of partners and overall talents available, as well as the types of platforms more likely to emerge and grow effectively.

This section discusses cross-platform findings across key thematic areas that defines platforms, both commonalities and differences. The key thematic areas are outlined in the framework below in figure 12. Customers – particularly farmers – are at the top as central to the platform's offering; below this are the products that customers interact with, which are determined by the business model, capabilities and partnerships of the lead organisation, below. The enabling environment sits around and influences all these themes. Along these findings, the section also discusses recommendations for platform players and donor partners supporting platforms.

Figure 12: Key Findings Framework



Whilst the intention to serve smallholder farmers for greater productivity and better livelihood is consistent across the platforms we reviewed, key assets and competencies of the organisations and initial drivers differs across platform leaders. The drivers and core business and assets have strong influence on what products each platform position as their initial or core products (e.g., financial products for banks) and how it sequences the rollout of various products to enhance the uptake and usage of the core products. They are also key determinants of the platform's business model.

Table 1. Platform drivers, key assets, initial products and business model¹²

	 Telco operator led	 Agribusiness led	 Bank led	 Government led
Driver	<ul style="list-style-type: none"> Enhance customer value proposition and loyalty Widen customer base Step into digital space 	<ul style="list-style-type: none"> Secure production Enhance revenue 	<ul style="list-style-type: none"> Expand customer base Cross-sell and de-risk Lead financial innovation 	<ul style="list-style-type: none"> Provide open data Promote digital collaboration Facilitate evidence-based decisions
Key asset(s)	<ul style="list-style-type: none"> Large customer base Low-cost backbone to reach farmers 	<ul style="list-style-type: none"> Ready to sell products Brand recognition Existing customer base 	<ul style="list-style-type: none"> Ready suite of finance products Brand recognition 	<ul style="list-style-type: none"> Wealth of agricultural research established reputation County networks
Initial Product	<ul style="list-style-type: none"> Advisory & information services Market linkages 	<ul style="list-style-type: none"> Market linkages Supply chain management 	<ul style="list-style-type: none"> Financial access 	<ul style="list-style-type: none"> Advisory & information services Macro agricultural intelligence
Business model	<ul style="list-style-type: none"> Direct revenue driving 	<ul style="list-style-type: none"> Revenue enhancing 	<ul style="list-style-type: none"> Direct revenue driving Revenue enhancing 	<ul style="list-style-type: none"> Publicly funded

Drivers and key assets, and core products and business model together have implications for target customers of platforms, discussed further in later sections of this report.

5.1. Customers

Farmers are the primary direct customers of platforms; while others such as policymakers and agribusinesses also benefit, sometimes as direct customers but more often as partners or collaborators. The successful acquisition and engagement of farmers is core to a platform’s success and is the focus of this section. In time, as platforms develop more sophisticated data management tools, they can also engage customers such as policymakers and agribusinesses with macro agriculture intelligence products.

Platforms tend to target ‘smallholder farmers’; yet this is a broad grouping, with many diverse sub-segments. Farmers vary by demographics such as age and gender, by economic factors such as land ownership and income level, and by other aspects such as education – including their level of digital literacy. These factors all influence a farmer’s engagement with platforms in general. For example, younger farmers are more likely to have digital skills and are more likely to adopt digital agriculture innovations. Some platforms may help to bridge the digital divide to farmers without digital skills. Thus, different types of platforms tend to focus on different segments of farmers.

-  **Telcos** tend to engage customers who have some form of access to markets so they engage with revenue-generating products. Higher-income farmers present a lower risk for engagement and have higher revenue potential
-  **Agribusinesses** usually attract both smallholders with more extensive landholdings and long-standing connections to a large commercial buyer, and those that have relationships with smaller off-takers. This focus enables more streamlined management and communications with farmers and secures their supply chain
-  **Banks** tend to engage farmers that have some level of income and market access to ensure that loans will be repaid

¹² More details on each provided in respective sections of the report



- **Governments** are more likely to engage farmers with low income and less access to markets since they have a public mandate and mission to reach the base of the pyramid farmers. Government-led platforms are the only type of platform that directly targets the lowest-income farmers

While most platforms come to serve a sub-segment of smallholder farmers more than others, as above, not many of them do so upfront with proactive farmer segmentation and explicit targeting. For example, one of the platforms examined only conducted a comprehensive assessment of customer segments two years after launch, finding that their actual customers had a higher income level than their intended target customers. Such discrepancy presents platforms with a choice: they can either realign the target customer profile to reflect the actual customer segments, or they can adjust products to better meet the needs of the original target customers. Businesses may have more flexibility in realigning their target customer segment, driven by the motive to design products that bring in revenues. However, for publicly funded platforms, the discrepancy between target and actual customer segments may indicate a failure to meet the development mission or government mandate to reach the lowest income farmers. We explore this further in the business model section, below.

Beyond segmentation, the depth of customer engagements in product and channel design varies across the platforms we reviewed; those with quick customer feedback loops and active user experience testing have seen more success in driving uptake and usage through refinement. The lead organisation's culture often determines the way in which each platform engages users – businesses that put customers at the heart of their core proposition tend to carry this culture through to platform development. For example, Stanbic Bank has built customer feedback into the design of their platform products right from the start of development, whereas KALRO has taken a more top-down approach that interacts less with end-users. The potential cost of not engaging with end-users is yet to be seen, as many platforms are still at an early stage of development, but could lead to low use of products and a drop-off in engagement. Those that do engage end-users tend to integrate consultation into their product design and create feedback loops from farmers via the platform itself as well as through their field force. Developing feedback loops allows quick changes, especially in relatively agile organisations that can adapt their approach at speed. For example, Sterling Bank received feedback that their 'SABEX 2' web platform wasn't workable for many farmers as they don't have access to smartphones. Sterling Bank was able to invest in developing USSD capability during the pilot phase, enabling their rollout to reach a greater number of farmers with just feature phones during the next phase.

Recommendations for Platform Providers

1. **Segment target customers to identify needs** and outreach plans for each type of platform
2. **Engage users in product design to ensure alignment with their needs.** Feedback channels help platforms to iterate the product design according to farmer reviews
3. **Build inclusive technology that extends services** into areas with low bandwidth and users with low access to technology and literacy

Recommendations for Funders and Policy Makers

1. **Support platforms that best meet the needs of your target beneficiaries.** Put the customer at the front when supporting the development of a platform
2. **Insist on inclusive platforms** that design for women and can bridge the digital divide
3. **Incentivise platforms to reach specific target customers**, e.g. through subsidising agents to onboard low income and women farmers.

5.2. Products

Platforms typically start with a small number of products, often tied into farmer-centric research, key platform assets or existing core business, and then expand into other products. Broadly, products stretch across advisory and information services, market linkages, supply chain management, and financial access. Key services that show high impact for farmers include access to mechanization, soil testing and irrigation.¹³ Platforms also offer macro agricultural intelligence services and digital decision support tools that integrate a variety of data on smallholder farmers, farms and markets. This information is converted into useful insights and decision tools for policymakers, extension agencies, agronomists, agribusinesses and investors, rather than directly for the smallholder farmer.

Table 2. Farmer-focused platform products, traffic and revenue potential¹⁴

Product	Traffic	Revenue
 Advisory & information services include weather information, lessons on agriculture practices and other advice that is or shared with farmers to help improve their productivity		\$
 Market linkages products link farmers to input providers so that farmers can purchase seeds, fertiliser and sometimes stretch to tools such as solar irrigation pumps and soil testing services. They also support SHFs post-harvest and through links to buyers		\$\$\$
 Supply chain management products include warehouse and storage services, and logistics and last-mile services. Functionality can involve a matching service (e.g. tractor renting) or facilitate negotiations and transactions (e.g. inventory management tools)		\$\$
 Financial access products include loans to farmers, savings accounts, crop insurance, and payment solutions		\$\$\$
 Macro agricultural intelligence products include agriculture sector tracking dashboards, agriculture extension system management tools, agribusiness investors intelligence systems, and climate observatories for agriculture	N/A	\$\$\$
 \$ low	 \$\$ mid	 \$\$\$ high

Some platform products are more likely to generate traffic and bring farmers on board, whilst others may have a narrower customer appeal, but drive platform revenue. Table 2, above, illustrates the reach of traffic and platform revenue potential from different products. Advisory and information services products have broad appeal to farmers, and require low time-

¹³ See Mercy Corps AgriFin website for 60 Decibels Studies with Hello Tractor, SunCulture and AgroCares
¹⁴ Figure is illustrative only and non-exhaustive; based on DigiFarm reach and revenue, 2020

investment from farmers, but can be a cost-driver for the platform. Market linkages products generate transaction sales; however, not all farmers will be able or willing to take up this offering due to barriers such as affordability, so bundling with input financing may be needed. Finally, supply chain management products and financial access generate less traffic and also bring in revenues for the platform. Further barriers such as a lack of digital literacy, logistics, climate and market risks and behavioural norms mean that meaningful investment must be made in these services. A portfolio of different products, both traffic-generating and revenue-driving, are important to bring in new customers, build active use and create value, noting that product bundles appealing to women smallholders may differ from those that appeal to men. Macro agricultural intelligence products are derived from the compiled data generated by the products targeted at smallholder farmers. While we are yet to see platform's fully utilise this product, these aggregated insights have the potential build an invaluable data source for decision makers and drive significant revenue for the platform. We explore these aspects further in the business model section, below.

The product roadmap that platforms follow depends on the platform leader, largely determined by their key assets and drivers for platform launch and must be informed by farmer needs

- 
• **Telcos** have most adaptability with their tech advantage in digital communications and can use this advantage across all products. They often start from a premise of market linkages products, coupled with advisory and information services pushed through their communication channels
- 
• **Agribusiness** typically start by bringing digitisation into their existing activities, with the product often streamlining internal activities and provide a service to farmers. Depending on the core business model, they typically start with market linkages products either access to inputs or an offtake product as well as building supply chain management
- 
• **Banks** typically start with a financial access product such as loan or savings provision. Whilst this may be coupled with advisory and information services, a financial access products is most commonly the first offering
- 
• **Governments** often start with advisory and information services, given their interest as a public entity in providing a service and education to farmers. However, they can play a more versatile role depending on where the leading entity sits within government.

Providers increasingly recognise the interconnected nature of digital products, and over time there is a convergence in platform offerings to take advantage of these portfolio benefits. The more developed a platform is, the more likely that platform is to have a diverse breadth of products to support customer needs across their farming activities. Whilst the core drivers and primary product offering may remain – for instance, banks will always focus on financial access – the suite of products offered by each platform is likely to become more similar over time. For example, DigiFarm, a platform with three years in operation, now has more than eight groups of product offerings, from input access through to credit and market linkages. Some bank-led platforms currently offering financial access and advisory and information services expressed their ambition to start market linkages offerings soon. Each platform aims to become a ‘one-stop-shop’, serving the needs of their customers, improving both farmer incomes and returns to the platform.

A mixed or bundled offering of products enhances the profitability of platforms and improves user experience as various products complement each other. Data about customers and product use also enhances business intelligence used for designing and managing the platform.

- **Complementary products improve profit across the platform by driving more traffic and revenue, lowering risks and empowering customers.** Advisory and information services, as discussed already, generate traffic and bring more ready customers for other, more profitable products. As another example, financial access providers are more likely to receive repayment on loans if they connect farmers to buyers through market linkages products, while crop insurance reduces the ever-present risks of drought, pest, disease and floods
- **Complementary products have multiplier effects on the farmer value proposition.** For example, farmers are more likely to grow their productivity and yield if they have access to advisory and information services to advise on best practice farming. They grow incomes by selling that increased production through a market linkages product. We note, however, that increased complexity of bundled products often requires new marketing efforts and the use of a digitally enabled field force to facilitate adoption, particularly among women.
- **Data about farmers and their use of products enhances macro agriculture intelligence that can enhance the design and management of other products.** Analysing farmers' product use on platforms supports more data-driven decision-making for platform leaders and product partners. This can often be paired with macro agricultural intelligence services from other platforms and partners to improve the dataset quality. For example, banks make more informed decisions on the savings, loans and insurance products offered to potential customers if they hold data about customers such as their land size, crops cultivated, etc, and on the potential customer's use of effective advisory and information services, and market linkages. Optimising and leveraging the flow of data across farmers and partnerships, while maintaining client protection and informed consent standards, is the lifeblood of any platform

Recommendations for Platform Providers

1. **Establish clear vision and objectives**, including a business plan, to guide technology development and partner engagement
2. **Develop a product roadmap** in line with vision, to plan and sequence product development and relevant partnership development. In time, build a full suite of product offerings to fully serve farmer needs
3. **Agree on a minimum viable product** to align on an agreed short-term goal and enable swift product development and release, incorporating early feedback to iterate the design of products
4. **Gather data on product use and generate macro agricultural intelligence** to better understand traffic, interactions across products and along the customer journey, whilst ensuring data is secure and gathered with full user consent

Recommendations for Funders and Policy Makers

1. **Continue to subsidise and support the rollout of non-revenue generating products** such as information and advisory services
2. **Support product development and build the business case for longer-term value products.** For example, offer to support climate forecasting information products or to cover premiums in input costs for climate resistant crops
3. **Address constraints in platform ability to share data across digital partnerships** and to engage farmers directly in the use of their own data

5.3. Business Model

Digital Agriculture Platforms tend to follow one of three business models:

- **Direct revenue-driving:** Platforms that focus on revenue-driving products charge a fee for service use, including market facilitation fees and input sales transaction fees. These platforms usually have a separate profit and loss statement to demarcate platform revenues from the core business
- **Profit-enhancing:** Platforms that contribute to increasing profitability of the core business through broadening reach, increasing revenue per customer, and improving internal efficiency. The platform integrates with core business operations, and the platform is financed as an internal investment
- **Publicly funded:** Platforms that rely on financial support from donors or the government. The platform does not set out to generate revenues from either direct or indirect channels but creates a public good

The business model is shaped by the lead organisation's drivers for setting up the platform, as discussed in the beginning of this section. Commercial players aim to either develop a new source of revenue, or enhance a current one, or both.



- **Telcos** primary driver is to launch a new revenue source and are therefore likely to pursue a direct revenue-driving model



- **Agribusinesses** look to secure their existing supply chain and are more likely to select profit-enhancing models



- **Banks** look to expand rural financial access and could choose either direct revenue-driving or profit-enhancing models



- **Governments**, with their public-serving mandate, are the exception and are more likely to pursue a publicly funded business model

Different products have varying revenue and profit generation potentials and take different roles in contributing to platforms' economics, as highlighted earlier in the products section.



- **Advisory and information services** are rarely revenue-generating. They help to drive traffic and enhance customer engagement. If linked to other products, they increase revenue in the long-term by teaching farmers better agricultural practices and improved financial intelligence



- **Market linkages** products drive revenues through transaction sales, especially when coupled with precision agriculture information and advice on appropriate use



- **Supply chain management** products drive revenues through transaction sales, especially if the platform creates more efficient interactions between stakeholders



- **Financial access** products drive revenues by increasing the take-up and adoption of other products, in addition to margins on interest repayments



- **Macro agricultural intelligence** drives revenues through (i) using the information to improve business processes, (ii) selling datasets to organisations looking to derive insights from the platform information, and (iii) compiling and analysing data to sell insights derived from the data

Given that each type of product plays a different role in the platform's economics, the choice of business models has strong implications on how platforms roll out products and what customer segments they tend to serve.

Direct revenue-driving platforms aim to scale revenue-generating services such as supply chain management, market linkages and financial services. Adopters of this model tend to be telcos and banks, who often start with a small base of customers and need to build their reputation in the smallholder agriculture space. The first step is rapid farmer acquisition through wide outreach to farmers to onboard and build the platform's presence as a service provider. Hence, their platforms may initially cast a wide net to bring farmers to their platform via 'traffic generating' products, for example, information and advisory services are a low-cost way to outreach and onboard farmers at scale. Once onboarded, platforms aim to move farmers across to revenue-generating products over the customer lifetime. Platforms use data to identify customer segments that are the greatest revenue generators, and then focus their attention on acquiring more customers that fit that profile, or expand product offerings to increase revenue generation from other segments. Table 2 in the products section supplies a further breakdown on the reach and revenue potential of various products. In time, revenue-driving platforms may choose to increase the depth of focus over scale and reach in order to increase their return on investment. These models are often housed in separate teams or business arms, helping to foster growth and protect fledgling initiatives from the stringent commercial returns that might otherwise be required as part of core company KPIs. For example, Safaricom housed DigiFarm within a separate internal team, and Stanbic positioned their platform within an innovation team. This separation also helps to clearly break out the platform's profit and loss from core operations.

Profit-enhancing platforms need to drive efficiency gains and increased adoption for products in the core business to achieve sustainability. Adopters of this model tend to be agribusiness, and some banks. The first step is to build products that directly interlink to the core business, such as input supply or offtake, and that help to enhance profits through improved internal efficiencies. Platforms pursuing a profit-enhancing approach may initially focus on farmers within their networks, testing and refining the digital offering in access to inputs or credit products, before looking to expand. Over time, they look to develop products that bring in new farmers and complement the core business offering, such as information and advisory services. Once onboarded, platforms aim to move farmers across to the products that enhance profits for the core business over the customer lifetime. These models of platforms do not have standalone entities or structures, instead falling under the lead organisation's profit and loss statement.

Publicly funded platforms need to focus on achieving their mission and align with donor or government agendas and are less dependent on the financial returns from products. Adopters of this model are more likely to be government-led platforms. The first step is to understand the donor or government priorities and to position the platform in order to qualify for funding. For example, KALRO's first product was a 'Food Balance Sheet' to meet a request from the Ministry of Agriculture. Publicly funded platforms are more likely to target low-income farmers to align with development agendas, engaging a wide selection of farmers to drive traffic to the platform. Over the customer journey, platforms aim to transition farmers from products that bring them into the platform, such as information and advisory services, to products which add value directly to farmer incomes, such as market linkages. These models of platforms are likely to have a heavy focus on macro agronomic intelligence due to the wider ecosystem benefits of improved

information, and monitoring, evaluation and learning outcomes in order to prove their impact to funders, especially if funding is tied to performance.

Recommendations for Platforms

1. **Develop a business plan to reflect the vision, scale, timelines, and return ambition.** It is key to develop a product roadmap from the beginning that quantifies the investment and returns over time
2. **Consider customer lifetime value in business plan development and transition farmers to products that drive value for the platform**
 - **Direct revenue-driving:** Transition farmers from traffic generating products onto those with higher revenue generation potential
 - **Profit-enhancing:** Transition farmers from traffic generating products onto those that contribute to revenues for the core business
 - **Publicly funded:** Transition farmers from traffic generating products onto those that maximise development gains and increase farmer incomes
3. **For direct revenue-driving platforms: balance and cover costs for non-revenue generating products through cross-subsidisation or alternative revenue models.** Traffic-generating products have higher customer acquisition costs than revenue generation. Platforms cover the customer acquisition cost with revenue-driving products or explore alternative revenue generation models such as advertisements and data monetisation
4. **Compile, analyse and disseminate data** from the platform to better understand use and implications; share and monetise raw data and analytics to drive revenue and build cross-learning with partners and other platforms

Recommendations for Funders and Policy Makers

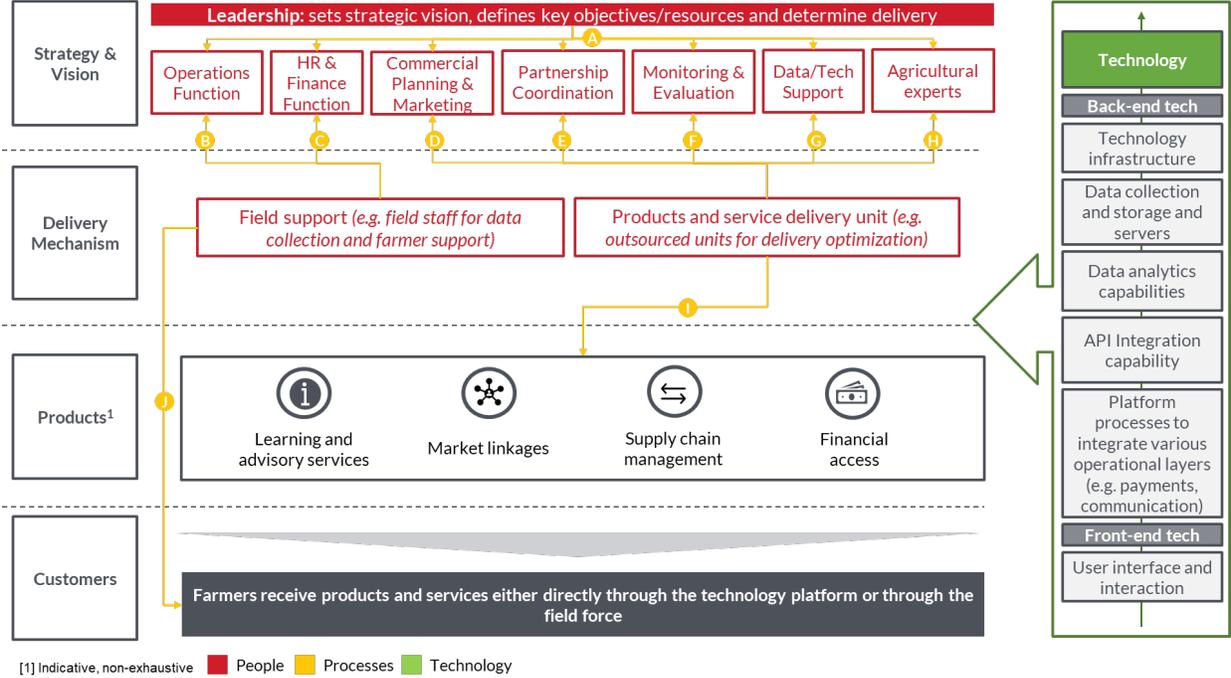
1. **Align support for platforms according to business models** that help to advance donor missions and mandates
2. **Fund platforms in the early stage** as they work towards profitability
3. **Consider subsidising platforms and products that focus on the bottom of the pyramid farmers.** Include result-based pricing of data for partners, encouraging them to target farmers that are less attractive from a business point of view
4. **Invest in services that build partnerships,** support farmer-centric design and de-risk innovation across these emerging models

5.4. Capabilities

Platform execution requires building a set of core capabilities internally, regardless of the core product or business model. These core capabilities exist across three interlinked components: a) people, b) processes and c) technology; and four layers of implementation: i) strategy & vision, ii) delivery mechanism, iii) products, and iv) customers. Once core capabilities have been established across these components and layers, the platform leader will be able to

identify areas where they have a clear comparative advantage, and where they need to invest in building capacity. The strategy and vision should remain with the platform leader, but the platform could consider using implementation partners as part of the delivery mechanism, and product partners to expand the product offering. A critical component of the success of platforms is early investment in all aspects of its' core capability, product roadmap and business model.

Figure 13: Illustration of Platform Capabilities



Processes

- A Governance processes:** Strong oversight and expert insight from leadership to each department to guide execution
- B Real-time reporting:** Interact with the various strands of the delivery unit through defined communication channels
 - Recruitment processes:** Set standards for recruitment/training/compensation and iterate through upward/downward communication with the delivery unit
 - Payment processes:** Monitor and reconciled activities of delivery unit to ensure consistent and timely payments
- D Product delivery and iteration:** Develop and deploy the strategy for rollout of the product and deploy with the delivery unit
- E Interaction of field presence and partners:** Product partners engage consistently with the delivery unit to ensure optimal roll out, issue identification and rapid iteration if needed
- F Weekly/monthly reports:** M&E units monitor reports to identify progress against KPIs for product optimization
- G Issue resolution:** Solve for tech/data related issues and conduct data analytics (e.g. predicative analytics for yield forecasts)
- H Communication between experts /field:** Experts interact with delivery unit to ensure that the content being disseminated is correct and accessible to farmers
- I Upward and downward communication:** Upward and downward communication must be maintained by the lead organization and outsourced delivery unit
- J Communication with farmers:** Field forces must have clear communication channels and avenues with farmers

Whilst technology is the basis of any digital platform, people and complementary processes are essential capabilities that ensure efficient functioning. Technology helps to streamline processes between lead organisations partners, digitising interactions, and easing operations. However, successful implementation requires a clear vision from the lead organisation, execution

across teams of people, and clear processes that ensure a coherent and consistent user experience for the farmer.

A **People are central to building a platform, from leadership who must articulate a clear strategy and vision, to multiple operational and technical entities.** These functions might be housed in a separate arm or business unit, or within the central lead organisation.

- **Leadership** define the vision, roles & responsibilities, processes, and the delivery strategy, including the incentive structure for successful implementation of the platform
- **Operations** function to manage, monitor and support implementation
- **Partnerships** teams oversee the sourcing, negotiations and management of product and implementing partners
- **Human Resources (HR) and finance** functions oversee recruitment, define standard operating procedures (SOPs) and compensation structures
- **Commercial planning and marketing** define the strategy for roll-out
- **Monitoring and evaluation (M&E)** teams ensure that the platform is iterative and evaluate performance against targets set at the outset of each season
- **Data/Technology support** is required to run the platform and develop the digital products, including in hardware and infrastructure development, software engineering, user experience, data analytics and data harmonisation
- **Agriculture expertise** and knowledge of agriculture markets is also core to the quality of products and services – overlooking the agriculture elements in favour of technical solutions can be costly. For example, building bulk trading into market linkages products requires a knowledge of agriculture commodity markets and trading in order to negotiate with offtakers

Each platform will need to invest varying effort into building these capabilities, depending on their key assets and chosen business model. Figure 14, below, illustrates the differing capability investment requirements for the four blueprint case studies.

-  **Telco-led platforms** need to invest in commercial planning and marketing in order to reach the wide net of farmers for a direct revenue-driving model. Data/tech support is a necessary part of their value proposition – and often comes from the parent organisation. Telco led platforms that rely on partners will need a strong partnerships function (see below section on partnerships), but can afford a smaller operations and internal agriculture expertise team to maintain oversight and quality assurance of product delivery
-  **Agribusiness-led platforms** need to invest more heavily in the core operations, agricultural expertise and commercial planning and marketing that underpins their core business. Monitoring and evaluation may be deprioritised as the platform meets internal drivers and enhances the core business, rather than external performance targets. Agribusinesses that choose off-the-shelf technology solutions can afford a smaller data/tech team – but will need some capability in order to manage platform design, development and maintenance
-  **Bank-led platforms** need strong leadership to drive platform vision in commonly risk-averse organisational cultures, as well as maintaining a strong finance function. Banks pursuing a direct revenue-driving platform need to invest in more commercial capacity and marketing to attract traffic to the platform. Those that rely on partners will need a strong partnerships function, but as with telco-led platforms, can afford to invest less in operations

implementation and building internal agriculture expertise, although they will still need some level of oversight to manage partners

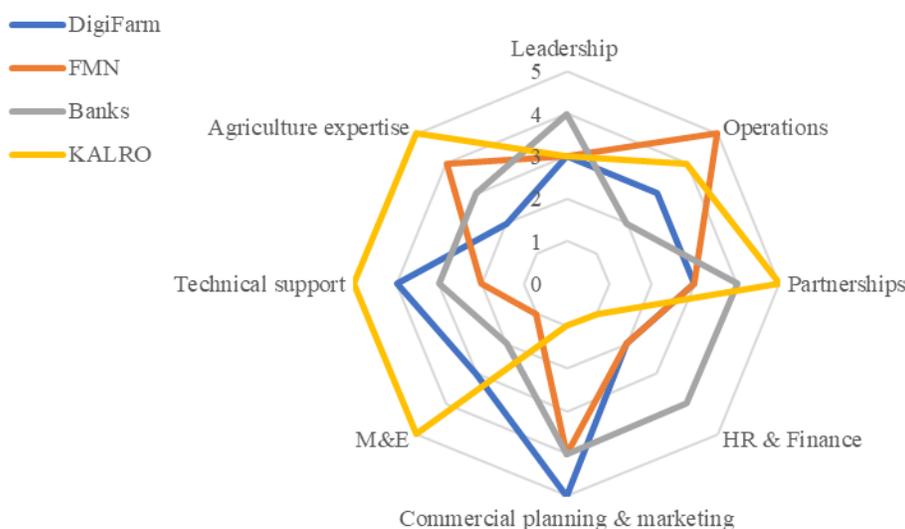


- **Government-led platforms** require a strong partnership function given the varying number of partners they look to collaborate with. Platforms that decide to build an internal technology solution and manage an internal field force (see below) will need strong data/tech support and operations teams. M&E is important for publicly funded platforms who may have funding tied to meeting performance objectives, whilst agriculture field expertise is often the key asset needed to meet the goal of supporting low-income farmers. On the other hand, they have less need for commercial planning and marketing as they do not need to secure direct returns

Over the course of our analysis, we evaluated the core capabilities of each of our main platform models under consideration, including Flour Mills of Nigeria, KALRO, DigiFarm and commercial banks with platform models. The capability map below illustrates the relevant strengths and weaknesses of different platforms, indicating critical needs for each typology.

Figure 14: Current capability needs of the four case study platforms

Current Capability Needs, by Platform



The platform’s field force is an essential people component of the platform’s delivery mechanism, with technology playing the role of a *critical enabler* rather than a replacement for a physical field force. A field force is the gateway between the platform, markets, and smallholder farmers. Unlike the strategy and vision, which must rest within the lead organisation, a platform could choose to outsource field force delivery through an implementing partner. Its function typically centres around increasing agricultural productivity, incomes, and market access for smallholder farmers. Whilst technology is a key enabler for the delivery of services, agents are the first and most crucial touchpoint between organisations and the farmers they serve – particularly older farmers and women. In-person agents help to build awareness, secure trust, incorporate user feedback and ensure customer retention, also helping to bridge the digital divide to those with lower digital access. The onset of the COVID-19 crisis has further amplified the need for the strategic blending of digital tools with human touchpoints. For organisations that work

directly with smallholder farmers, the crisis has severed direct access to farmers thus amplifying the need for agent touchpoints to facilitate critical linkages. Field agents increase critical information dissemination relating to agricultural production, drive digitalisation and uptake by providing core digital training, and ensure farmers can access tools for core extension services that are critical for production, such as input loans.

B Processes help to ensure that the platform runs smoothly, including clear decision-making, onboarding, communication, data and payments systems. Clear and transparent processes are required for all organisations, with potentially multiple departments and partners working closely together needing to understand who handles decision driving and sign-off. A critical success enabler for any platform is therefore a clear set of standard operating procedures (SOPs) for onboarding procedures, upward and downward communication processes and effective data reporting and collection tools. In the early stages of platform development, standardised onboarding and training processes for both employees and partners reinforce overarching objectives and the various roles and responsibilities. Thereafter, simple and standardised upward and downward reporting and communication processes between the lead organisation and various strands of the delivery unit ensure that information is being communicated in near real time and is therefore actionable. Clear reporting processes also allow for easy payment reconciliation processes for the lead organisation and enable data collection and issue identification.

C Technology is a core requirement of a platform, requiring platforms to select between different types of back-end infrastructure: either off-the-shelf or customised digital platform infrastructure, and either physical (local) or cloud (remote) data storage infrastructure. Firstly, custom in-house technology affords organisations more flexibility, but incur higher costs; off-the-shelf software typically requires lower investment but has limited flexibility to integrate ad hoc functionalities. For example, FMN used their existing technology platform, Microsoft Azure, with the benefit of a streamlined IT system across business functions within the organisation. However, FMN has limited flexibility in further customising or tailoring the technology design to better meet the needs of the customer. Secondly, physical data storage allows a higher speed to upload and download data to the server, control over the system setup, and more security. However, it has expensive installation costs of hardware and ongoing maintenance requirements. Cloud storage data infrastructure is accessible from any location with an internet connection, and the cloud provider covers the required maintenance and upgrades. Cloud storage providers can also bring additional big data analytics capabilities. For example, IBM is working with Hello Tractor’s developers to apply several technologies including the Watson Decision Platform for Agriculture, blockchain, the Internet of Things (IoT) and IBM Cloud, to the app.¹⁵

On the front-end, technology must be accessible to users, interoperable for partners and create accessible data for analytics and sharing. The user interface needs to be flexible so that it remains accessible to a wide range of customer segments. Due to the need for partner integration, a platform needs to have application programming interface (API) capabilities that enable interoperability for partners and other platforms to integrate effectively. In addition, farmer data is increasingly used to create robust profiles that can be refined and accessed in real-time by multiple product and service providers – including financial services providers, agro-processors, input

¹⁵ CTA, “The digitalisation of African agriculture report”, 2019

suppliers, and farmer cooperatives. Thus, platforms need to factor in data analytics and data sharing capabilities to input to partners, macro agricultural models, and facilitate knowledge building across the agriculture ecosystem.

Each type of platform leader brings different strengths and is more likely to be challenged in a different area of capability according to their key assets and core business operations. Table 3 below gives an overview of the various strengths and challenges that various platform leaders may face in execution.

Table 3: Overview of various strengths and weaknesses for platform execution

Organisation Type	Strengths	Gaps
Telco operator led	<ul style="list-style-type: none"> Strong technical expertise and data storage capabilities 	<ul style="list-style-type: none"> Limited on ground support in the form of field agents
Agribusiness led	<ul style="list-style-type: none"> Strong in-house agronomic expertise Strong commercial planning and marketing expertise 	<ul style="list-style-type: none"> Limited technical expertise and data capabilities
Bank led	<ul style="list-style-type: none"> Strong operational capabilities and processes 	<ul style="list-style-type: none"> Limited agronomic expertise Limited on the ground networks in the form of field agents
Government Institution led	<ul style="list-style-type: none"> Strong agronomic expertise and established links on the ground through existing networks of field agents 	<ul style="list-style-type: none"> Limited internal capacity for technology and partnership development

Platforms are frequently housed in incubated arms or special programme teams to drive incubation and build these capabilities. This demarcation helps to foster growth and protect fledgling initiatives from the stringent commercial returns that might otherwise be required as part of core company KPIs. For example, BK TechHouse, which runs Smart Nkunganire System, is set up as an independent company within the Bank of Kigali Group. This enables them to independently innovate whilst benefitting from the bank's financial and reputational assets. Incubated initiatives are given deliberate space to grow, whilst also leveraging the reputation and strength of the company's core offering. DigiFarm's growth trajectory reflects the value of leveraging and amplifying a company's core offering. Through a three-year incubation period under Safaricom PLC, DigiFarm was able benefit from Safaricom's trusted brand and market, strong technical and operational capabilities, and marketing resources, to develop and scale the platform.

Recommendations for Platform Providers

- Invest in clear and strong leadership structures** to define the platform's components and layers of implementation

2. **Define the platform's core strategy and vision**, delivery mechanism, platform products and target customers upfront
 - **Identify strengths and weaknesses** to optimise on the platforms' underlying comparative advantages and identify areas for investment
 - **Consider working with partners to fill gaps** in delivery mechanism and product capabilities - such as tech infrastructure or physical field presence
3. **Invest in people** and quality talent who execute platform development; do not rely on technology to solve every potential barrier
4. **Set clear processes** alongside realistic targets, and build them into KPIs of directors tasked with executing the platform
5. **Protect and provide space for innovation and incubation** by strategically building out capabilities through in-sister companies or incubated arms, and **invest in data capabilities** to improve data-driven decision making

Recommendations for Funders and Policy Makers

6. **Consider funding placements** or subsidising recruitment of key roles, particularly for publicly funded platforms
7. **Ensure funding for digital solutions also incorporates field operations** by tying together the two components as requirements for funding
8. **Leverage strengths and instruments to engage financial service providers** around platforms to ensure that critical funding flows to farmers are incorporated.

5.5. Partnerships

Platform partnerships tend to take two forms: implementing partners that support the delivery mechanism to farmers, and product partnerships that expand the platform's offering. In some cases, partners fulfil both roles, and the lead platform organisation may also use their own delivery mechanisms and product capabilities.

Implementing partnerships expand the distribution channels to farmers and help to rapidly expand platform reach. Implementing partners serve as a critical customer touchpoint throughout the customer journey by supporting onboarding, collecting data from farmers, and providing agronomic support. DigiFarm chose to work through implementing partners based on the existing scale, geographic reach and knowledge of farmer networks, instead of needing to invest in building out this capability themselves. The Kenya Livestock Producers Association reached 1.5 million farmer members in Kenya and had a network of 400 agronomists and agrovets for field work. Africa Instore Solutions extended this further through their reach in different counties. Today both partners provide DigiFarm with ~1,500 Digital Village Agents (DVAs) who support farmers' digital customer journey by registering farmers, providing extension services, facilitating produce collection and overseeing quality assurance. DVAs also deepen customer relationships by sustaining farmers' engagement as active DigiFarm users for longer periods, increasing their customer lifetime value. Some platforms use their own in-house delivery mechanisms and rely on partner channels to amplify their reach. KALRO has direct relationships with 80,000 farmers and

uses implementing partnerships to expand channels to farmers for their digital products, as well as supporting field data collection.

Product partnerships are key to broadening the platform offering and bundling multiple products that meet multiple user needs. Product partners bring tested products, agronomic expertise, and valuable market knowledge to the platform. Sterling Bank’s SABEX 2 platform partners with AFEX Commodities Exchange, who facilitate market access by offering commodity price information to inform farmers’ decision to sell their produce. They offer warehousing so that farmers store harvests and sell their produce when the market price is higher. Sterling Bank would not be able to offer this service without AFEX’s contribution. DigiFarm also relies on a broad range of product partnerships to solidify its value proposition of being a ‘one-stop-shop’ for farmers. iProcure uses a logistics system that provides high-quality inputs from suppliers to agro-dealers and eventually farmers. Product partnerships enable platforms to expand their offering rapidly, and beyond the capabilities of the lead organisation.

Different types of platforms tend to approach partnerships differently according to their internal drivers, assets and capabilities.

-  • **Telco-led platforms** pursue bilateral and non-exclusive arrangements and take a decision making role in partnership direction and user engagement. Agreements are more likely to look at revenue share or transaction fees that bring returns based on volume over upfront fee-based deals. Implementing partners help telcos to engage with a broad base of farmers, whilst product partners help to build a diverse offering. Partnerships with donors and technical experts bring access to funding and technical support. Tech innovators are key partners given the easy tech integration with the telco assets
-  • **Agribusiness-led platforms** may have to follow standard procurement and partnership processes of the organisation, which could affect timelines and the ease of onboarding. They are more likely to look at exclusive and upfront arrangements. Partners include both digital partners – often tech innovators – who help to expand the digital offering, as well as partners with an existing working relationship that move onto the digital platform
-  • **Bank-led platforms** approach partnerships cautiously to minimise risk. Partnership models vary, including both revenue share and purchase agreements. Partnerships help to expand capabilities, particularly in agronomic expertise and field presence – and incorporate both implementing and product partners. Banks often pursue close relationships with government given industry banking regulations, but engagement with tech innovators varies by market (see section on enabling environment, below)
-  • **Government-led platforms** cast a wide net in their pursuit of partnerships and take a non-exclusive approach to bring involvement across the agriculture ecosystem. Partners may serve a dual role, both supporting the rollout of government products but also inputting data to macro agronomic models held by the platform. Government platforms are often part of data sharing and open data agreements to make platform outputs widely available, and partnerships are more easily navigated with organisations that also participate in these initiatives, including tech innovators

Partners are core to the functioning of a platform; they gain from the reach, economies of scale, networks and reputational association offered by a strong lead platform organisation. Partners gain from a direct channel to the platform’s client base, and the economies of scale from pooling resources with others through the platform. For example, reduced customer acquisition costs from reaching potential customers through a single touchpoint, and support offered to famers

through a platform's field agent network. Platform leaders' reputation offers credibility and legitimacy to partners, particularly new start-ups, helping to forge trusted relationships with customers and other ecosystem actors. These gains are especially valuable to tech innovators who are often at earlier business development stages and seeking opportunities that drive their revenues whilst minimising costs and promote brand recognition.

Yet both implementing and product partners face challenges in partnership with platforms due to their different ways of working and may find it difficult to collaborate without upfront clarity. These challenges include:

- **A misaligned vision or mission** leads to different approaches in creating value, especially in the conflict between commercial gains and impact objectives
- **Divergent business models** also demand different levels of partner involvement – for example, revenue sharing requires joint investment to promote products, whereas a purchase agreement leaves the onus on the platform to close sales in order to secure revenues
- **Unclear terms around partners' roles and responsibilities** make it hard to build accountability mechanisms and track progress towards shared goals. Clarity is particularly needed with regards to data, with the potential for undefined data ownership structures, unclear data sharing policies, and unspecified responsibilities towards payment for platform integration
- **Unclear timelines** for communication and execution of tasks leads to poor coordination. Tech innovators may be accustomed to fast-paced timelines compared to larger bureaucratic enterprises which follow meticulous internal procedures
- Lastly, **interpersonal conflict among leaders** leads to a breakdown of trust and good-will among partners

Partners and platform owners often lay the foundations for successful partnership through a series of smaller engagements to gradually build trust and establish ways of working. As relationships deepen, they expand the scope of work. Some platforms use this 'pilot approach' to assess potential partners whilst leaving room to grow and refine their products to farmer needs. For example, Kenya's Rural Centre for Mapping of Resources for Development (RCMRD) worked with the Ministry of Agriculture on minor projects, often going beyond the scope of work to build rapport and familiarity before being onboarded for larger scope projects, including contributing to KALRO's datahub. In other instances, platform owners run a 'trial period' of partner products. FMN is running a one-year pilot with a potential product partner to test the suitability of their precision agriculture product to their needs. This requires a heavy investment from the innovator into customizing their product, with no assurance of revenues unless FMN formally contracts their services at the end of the testing period.

Recommendations for Platform Providers

1. **Align vision and objectives**, and clearly define ownership and roles and responsibilities to harmonise partners' engagement and establish robust accountability systems

2. **Plan for and invest in target partnerships that expand product offerings** and build channels to customers – not replacing core capabilities. Use the product roadmap to prioritise and deliberately time partner engagement.
3. **Agree on the management, licensing, branding, and revenue sharing upfront** to create clear bounds for negotiation, and in particular **data sharing across partners**
4. **Start with small engagements** with potential partners before expanding to full implementation to test out ways of working and ensure product suitability to end-user needs
5. **Build internal teams** to work with partner innovators to ensure their individual success

Recommendations for Funders and Policy Makers

1. **Play a matchmaking and mediating role** in partnership discussions so that parties build complementarity and agreement towards partnership. Mediation helps to build trust by providing impartial input and ensuring that each party's interests are fairly represented and heard
2. **Address data sharing and other regulations** that penalise platforms partnering with technology innovators

5.6. Enabling Environment

The enabling environment refers to the external factors in a market that influence a platform's growth and lies outside the control of an individual platform owner. The enabling environment in different markets helps to enable or restrict platform growth by influencing the buying habits of farmers and the behaviour of other stakeholders. In this section, we look at six key elements of the enabling environment and how they relate to platforms: (i) the regulatory framework, (ii) access to finance, (iii) human capital, (iv) infrastructure (v) ecosystem density, and (vi) market maturity.¹⁶

(i) Government regulations dictate the parameters in which platforms operate; unfavourable legislation restricts platforms, whilst government support accelerate adoption. Governments play an influencing role across both the digital and agriculture ecosystem, in particular by providing (or not providing) support to young companies and tech innovators through tax breaks, incentives and the ease of doing business.¹⁷ As a new and growing area, digital innovations often outpace regulatory regimes with new developments being subjected to fewer limitations than other established industries.¹⁸ For example, banks may face fewer restrictions on a platform than they do as part of their core activities. However, in other cases, regulations mean that banks face limitations in platform execution that competitors do not have, given the wider regulations that govern bank activity. Building government relationships is particularly important to scaling platforms in markets with highly influential governments. For example, BK TechHouse's

¹⁶ Kim, Jeehye, Parmesh Shah, Joanne Catherine Gaskell, Ashesh Prasann, and Akanksha Luthra. 2020. [Scaling Up Disruptive Agricultural Technologies in Africa](#). International Development in Focus. Washington, DC: World Bank. doi:10.1596/978-1-4648-1522-5

¹⁷ GSMA, ' [Connected Society: An Overview for Policymakers](#) ', 2020, p2

¹⁸ UNCTAD, ' [Technology and Innovation Report 2018: Harnessing Frontier Technologies for Sustainable Development](#) ', 2018, p3

partnership with the Rwanda Agricultural Board has been critical to the scale and success of their e-subsidy product. In Ethiopia, the strong government influence meant that a government-led platform was the first to emerge, with the Agricultural Transformation Agency (ATA) offering the first farmer support hotline.

Governments play an important role in levelling the playing field for different platform operators through fair and effective regulation that promotes competition and protects consumers. Firstly, in providing a ‘one-stop-shop’ solution to farmers, platforms have a tendency towards monopoly, and could lead to reduced competition if one platform is allowed to dominate the market. Over time, this reduces choices for farmers and other stakeholders. Secondly, digital platforms by nature accumulate, track and store data on multiple farmers and other users. Platforms need to respect the privacy and consent of stakeholders in the storage and use of this data and ensure adequate security measures to prevent hackers from stealing private data. Government plays an important role in setting standards and regulations for the use and protection of user data.¹⁹

(ii) Platforms tend to be funded by the lead organisation; many seek donor support to subsidise development or establish infrastructure. Both start-up investment and working capital to finance operations is needed to sustain and scale platforms. Widespread availability of capital – either through commercial channels at low interest rates or preferential rates supported by donors – makes it easier for platforms to invest in the infrastructure and skills needed for growth. Large businesses benefit from easy access to finance to fund growth due to their size and established presence. However, the availability of funding depends on risk appetite, the markets in which donors operate and any restrictions on financial flows in that jurisdiction. In-kind support and capacity building also play an important role in providing resources for platform growth.

(iii) Availability of skilled labour provides platforms with a pool of potential workers; high levels of digital skills provide a market base for platform growth. Skilled labour is needed to fill capability gaps in platform development teams (see above section on ‘capabilities’) – the more availability in the market, the easier it is for platforms to recruit skilled workers. In markets with higher levels of digital literacy, tech innovators connect with potential customers more effectively, as users engage with multiple functions and make fuller use of digital offerings with relative ease. In a study of Digital 4 Agriculture Platforms in Africa, digital product and services providers noted that low levels of digital literacy constrained demand, adoption, and use of their digital solutions.²⁰ The more familiar users are with mobile and digital devices, the easier it is for new innovations to scale rapidly. In markets with low user digital literacy, platforms need to innovate to engage customers through a platform.

(iv) Established digital infrastructure and strong networks in a market help to enable the spread of platforms. Strong connectivity and networks, the availability of servers and storage, and high digital and mobile money penetration provides a strong base for platform development and well developed channels to consumers.²¹ A landscape study of Africa’s digital platforms showed that South Africa, Kenya and Nigeria, countries with leading mobile penetration, have the highest number of unique platforms users and the highest number of operating platforms on the

¹⁹ United Nations Conference on Trade and Development, [‘Digital Economy Report 2019: Value Creation and Capture: Implications for Developing Countries’](#), 2019, p135

²⁰ CTA, Dalberg Advisors, [‘Digitalisation of African Agriculture Report 2018 – 2019’](#), 2019 p158

²¹ GSMA, [‘Connected Society: An Overview for Policymakers’](#), 2020, p37 – 38; p 150 -151

continent.²² Established infrastructure particularly benefits telcos, who leverage their existing networks, as Safaricom has done in Kenya – even using their advantage in mobile money to compete with bank financial service offerings. In markets such as Ethiopia, where infrastructure is dominated by government entities, government led platforms are strongly positioned for success.

(v) High density of technology innovators offers platforms multiple potential partners; interactions among innovators promotes the development of new technologies that can be adapted for agriculture. Collaboration between tech peers and across different solutions accelerates the growth of the digital sector through the sharing of data and building cross-learnings. The more developed the digital ecosystem is, the more likely that digital solutions crossover to the agriculture sector, leading to a number of complementary and competing digital solutions. Creative solutions can also be imported by foreign companies – for example, Hello Tractor is importing their tractor service-matching innovation from Nigeria to Kenya. These multiple technology innovator solutions provide platforms with a multitude of potential digital partners. Telco-led platforms such as DigiFarm are well positioned to succeed in mature digital ecosystems because their digital assets enable them to build strong relationships and foster collaboration between digital players. On the other hand, government-led platforms struggle to compete with private platforms due to capacity constraints and a lack of commercial drive – for example, Kenya’s robust digital environment has given rise to commercial innovations that compete with some of KALRO’s digital products.

(vi) Platforms help to bring coordination to unstructured agriculture value chains by creating linkages among supply chain actors. Structured value chains, formal businesses and coordination amongst actors are all indicators of agriculture sector maturity. Agribusiness-led platforms particularly benefit from these fragmented agriculture markets, as they leverage their broad relationships and connections in the industry to convene partners to their platform. For example, fragmented producers and buyer dynamics has enabled the growth of Twiga’s digital platform and logistics network which links smallholder farmer produce to urban retailers and customers in Kenya. Government platforms play an important convening role in markets with multiple agriculture players and a more educated customer base, bringing together knowledge and creating public information for the benefit of the sector.

Recommendations for Platform Providers

1. When entering a new market, take the time to understand and map the enabling environment to **identify the key enabling factors and potential barriers**
2. **Engage and build relationships with key decision makers**, particularly in government and regulatory decision makers
3. **Participate in data-sharing initiatives** that expand agriculture knowledge and build capabilities that facilitate effective data-sharing with partners
4. **Consider legal counsel** to ensure regulatory compliance, data protection and security for individual user information

²² Insight2Impact, [‘Africa’s Digital Platforms: Overview of Emerging Trends in the Market, 2018 -2019’](#), 2019

Recommendations for Funders and Policy Makers

1. **Work with governments to advocate for policy** that helps to enable platform growth
2. **Leverage relationships with financial institutions** to engage with platforms to support financial inclusion and platform investment and growth
3. **Consider helping to expand digital access** and support digital literacy training, with a strong emphasis on bridging the digital divide and reaching women
4. **Support tech innovators and make investments** that help to expand the digital ecosystem
5. **Encourage competition through parallel tech innovations** such as price comparison and consumer advice services that help farmers and consumers choose between different platform offerings

6. Scaling Technology Innovators

Tech Innovator Challenges

Technology innovators face challenges in bringing their solutions to smallholder farmers, as detailed in Figure 15, below.

Figure 15: Summary of Challenges for Tech Innovators



Partnership with DAPs provide tech innovators with resources and relationships that give a strong foundation for innovators to grow and scale quicker than they could alone.

Platform Opportunities

Platforms provide farmer data and information to support tech innovators' development and expansion. Established platforms hold valuable customer insights through their end user data analytics and market experience, which they share with tech innovators. Farmers' behavioural data helps to improve the relevance of tech innovator products for farmer needs, enabling them to tailor products and better meet the needs of end-customers.

Platforms' large-scale technology infrastructure gives innovators access to tools that build their capacity and enable customer acquisition at a lower cost. For example, sharing USSD capabilities with platforms enhances innovators' reach to low-tech farmers and might be too expensive for them to pursue independently. Platforms may also have existing farmer networks and field force agents that rapidly expand the innovator's channels to potential customers.

DAP's relationships with clients and other ecosystem actors give innovators opportunities to create linkages across the value chain and broaden and deepen their networks within the sector. DAP's links to other actors can expand the potential customer base and draw in new customers to a tech innovators offering. The DAP's direct field networks to farmers enables innovators to lower their customer acquisition costs by cross-selling products to DAPs' existing clients, rather than needing to set up their own last-mile networks to target, onboard and support

farmers. Tech innovators leverage the brand visibility of the lead platform to build their reputation and demonstrate the value of their products and services at scale.

A platform's decision to partner sends a strong market signal about the innovator's business model and investment attractiveness. Innovators that partner with platforms use these relationships and agreements as a proof of concept to build faith from investors and banks, enabling them to access finance. This is especially valuable in the early development stages when companies are seeking growth capital for further expansion.

Platform Partnership Challenges

Innovators face challenges in aligning on ways of working and the terms of engagement with platforms, from pre-partnership talks through to project execution.

Before partnership and in exploration phases, innovators and platforms may have divergent priorities. In some cases, they may not have yet defined their long-term vision or business model, making it difficult to align with potential partners. For example, a new innovator may be focused on broadening its user base, whereas an established platform could be seeking to deepen user engagement to generate revenues. Start-up businesses may also face capital constraints that limit their ability to invest in new partnerships and take on large projects without upfront remuneration. This might limit their ability to engage with organisations looking for co-investment and scale. For example, one innovator platform partner spent USD 1 million in investment costs for the first two years of partnership and projected a further USD 0.5-1m in total losses before reaching annual break-even. Another innovator taking a faster pace spent USD 1.5m in investment costs over the first two years and projected a further USD 2.5 m in total losses before reaching annual break-even.

In partnership discussions, innovators face challenges related to both the process and negotiation terms. Negotiations with large organisations take time, putting pressure on an innovator's cash flow. Innovators often have lower bargaining power because they tend to be smaller organisations with comparatively fewer resources. The contribution that an innovator brings to the platform could be undervalued if they do not have a clear vision and outline of their value proposition. Finally, innovators and platforms may seek different business models. For example, an innovator may prioritise purchase agreements to secure working capital, whereas a platform may seek revenue shares to manage financial risks and secure innovators' buy-in to promote the platform.

As innovators work with platform partners, they can encounter unclear roles and responsibilities, a shifting scope of work, and reduced customer engagement. Without clearly defining the partnership roles upfront, a lack of coordination could require changes to activities down the line. Cashflow restrictions may make it more difficult for innovators to accommodate changes in scope without changes in compensation. Finally, platforms could also reduce the tech innovator's visibility to their end users if platforms act as a single interface to the farmer.

Recommendations for Tech Innovators

Before partnership

1. **Build a start-up vision with a roadmap** to clearly identify when partnerships would bring most value to your growth journey
2. **Find finance partners upfront** and secure funding sources ahead to fund any trials/pilots so that you can flexibly adapt to shifting scopes of work if needed

In exploration

3. **Seek out partners who share your vision and execution priorities.** Alignment of goals is more important for success than partnering with a ‘big name’ that might have a different agenda
4. **Identify and develop relationships with key decision makers** within platforms to gain some visibility on how their internal partnership discussions are advancing, and have internal support advocating in your favour

In partnership discussions

5. **Be patient and invest time** building rapport, keeping in mind that large platforms may not be able to act swiftly
6. **Build solid financial analysis** to back up proposals for remuneration and strengthen your negotiation position
7. **Agree on data ownership, sharing, use, and licensing** to avoid high-stakes conflicts at later stages

As you work together

8. **Clearly define roles and responsibilities** and the scope of work to synchronise your ways of working and set up accountability mechanisms
9. **Set open communication and establish integrated ways of working** from the outset, and document those practices

7. Achieving Climate and Gender Goals

7.1. Climate

Need for Action

Smallholder farmers in sub-Saharan Africa are at the forefront of the climate crisis. They face challenges of soil erosion and degradation, whilst changing rainfall patterns and the increase in extreme weather events affect crop suitability and yields. Yet it is possible to increase agriculture yields and protect the environment through restoring forests, adopting climate-smart agriculture (CSA) practices, employing green technology, and implementing better livestock and waste management practices. Farmers rely directly on the climate and environment for their livelihoods; there is a compelling case for engaging farmers and championing their action. Platforms are well positioned to promote climate and environmental sustainability through enabling access to CSA technologies and practices and providing data-driven insights for decision making.

Platform Opportunities

Firstly, DAPs link value chain actors to promote the uptake of CSA practices, technology and finance for improved resilience and sustainable farming. Information and advisory services support farmers to better understand the environmental implications of different decisions, and to help them practice sustainable farming, such as a shift to agroforestry and regenerative agriculture. Platforms connect farmers to technologies such as solar water pumps, soil testing kits, and other precision agriculture tools to ensure the sustainable use of resources, whilst weather-based insurance helps to strengthen farmer resilience to the effects of climate change. Tech innovators are often distributors of CSA products, and they work with platforms to widen their reach to smallholder farmers, coupling products with financial access through the platforms to enable farmer purchase. CSA technologies increasingly come with tracking devices, enabling a platform to gather data on distribution and use. Such data helps tech innovators better understand their customers and products and also informs wider ecosystem actors on the uptake and resilience of farmers to the accelerating effects of climate change.

Secondly, DAPs help to collate information on agriculture activities, inputting to scenarios of current and future climate emissions and impacts to inform resource allocation. Satellite imagery and field data fed through platforms help to monitor land use change, including crop cover, ecosystem degradation and natural disasters. Such information helps to inform long term planning through the environmental modelling and geographical mapping of climate scenarios for both emissions from agriculture, and the areas at risk from climate change. Climate data models and analytics enables governments to better enforce environmental regulations to reduce emissions and pollution from agriculture and allocate resources to improve the resilience of communities most at risk from the climate crisis.

Implementation Challenges

Challenges such as upfront financial cost, behavioural norms and low commercial incentives limit the implementation of climate progress through DAPs. Firstly, CSA technologies are often more expensive than alternatives – for example, a solar water pump is more expensive upfront than a diesel pump, although the running cost of diesel makes it more expensive in the

long run. Linking climate smart agriculture technologies through credit products available on the platform could lead to an increase in farmer adoption. Secondly, behavioural norms around damaging farming practices persist even at an ecosystem level. DAPs might even contribute to the continuation of industry-wide use of unsustainable agriculture practices such as pesticides, monocropping and over extraction of water resources, if the environment and location of the farmer is not considered. In the adoption of any new farming practice, cultural and behavioural shifts can be a challenge, and platforms need to supplement information and advisory services with support for farmers to implement changes. Finally, there are low commercial incentives for platforms to integrate climate considerations, at least in the short run. A drive for short term revenue generating products may mean that climate initiatives are deprioritised. The environment is often seen as a ‘public good’, with the responsibility lying with government or delegated for other platform partners to address.

Recommendations for Platforms and Digital Innovators

In design

1. **Consider climate across the business model** of the organisation and in each product to avoid perpetuating unsustainable climate practices for farmers
2. **Consider climate finance partners** when raising capital
3. **Develop clear MEL structures** that incorporate climate into KPIs
4. **Partner with expert organisations** who incorporate environmental considerations

In implementation

5. **Gather and share environmental data** such as soil quality and water use
6. **Link CSA technologies to credit** products through the platform
7. **Use the platform’s field force to deliver training** on sustainable farming practices

Recommendations for Funders and Policy Makers

1. **Support platforms to develop the business case** for climate smart products
2. **Advocate and raise awareness** on climate and agriculture issues
3. **Develop clear MLE structures** that incorporate climate goals into programme KPIs
4. **Take climate into account across all projects**, as well as dedicated funding for climate
5. **Consider subsidising climate smart agriculture** technologies and information and advisory services
6. **Tie platform funding to achieving climate goals** and the release of climate products

7.2. Gender

Need for Action

Women face cultural and structural barriers in agriculture, from access to technology and finance, to unequal power dynamics. Gender gaps in agricultural productivity in sub-Saharan

Africa range from 8% in Kenya, 11% in Ethiopia, and 28% in Malawi to 30% in Nigeria. These gaps reflect multiple sources of barriers, including women's lower access to agricultural inputs, lower returns on the inputs they use, disadvantages in access to credit, unequal access to productivity yielding tools due to cultural and social norms, and insecure land rights.

Platform Opportunities

Platforms help women to leapfrog inequities and to become more engaged in agricultural development through providing direct access to finance, agronomic knowledge and market connections. By circumventing traditional channels for access, DAPs narrow existing gaps in agricultural productivity by equalizing access to agricultural inputs and tools, whilst simultaneously increasing the return on investment to these inputs through key learning tools and skills training. More indirectly, direct access to financing and time-saving interventions, such as logistics for market access, translates into productivity gains, higher and more diverse income and tangible assets that shift women's bargaining power at the household level.

The direct engagement of women on platforms also sheds a light on women's engagement in agriculture and rural gender dynamics more broadly through data gathering. There are critical gaps in understanding the full complexity and scope of issues impacting women smallholder farmers. This is primarily rooted in marketing and data collection approaches that are targeted at the household level, and therefore gender blind in their failure to capture nuanced intra-familial gender dynamics. The deliberate inclusion of women on DAPs and collection of gender-disaggregated data, thus presents an opportunity to fill gaps in knowledge around women's engagement in agriculture and decision-making dynamics. Moreover, a disaggregation of dynamics by gender yields insights that make a case for product and investment planning. For example, research consistently shows that women are more likely to invest in income generation and are more likely to repay loans. These nuanced dynamics create a strong investment case for platforms, highlighting a tangible opportunity and affirming the need for intentional outreach and support.

Implementation Challenges

Structural inequalities that contribute to a gender-based digital divide, such as lower mobile penetration and lower digital skills, behavioural norms, and time poverty, may limit the implementation of gender equity through DAPs. In comparison to men, women farmers generally face unequal access to and control over key productive assets that improve agricultural productivity and profitability, such as savings and credit, land, smartphones and mobile internet, and other agricultural inputs. For instance, women across sub-Saharan Africa are 23% less likely to own a mobile phone than men. These disparities translate into unequal access to DAPs that give women farmers critical information, financial support and access to more consistent and higher-value markets. Indeed, early evidence from one platform suggests that women make up a lower proportion of registrations and are less likely to take up some platform products such as input loans. Moreover, a lack of sufficient digital and electricity infrastructure, mobile networks and digital skills in rural areas exacerbates the existing gender-based digital divide. Underlying these disadvantages are gendered norms and practices, reflecting unequal power relations and gender divisions of labour at the household level that skew the division of unpaid work in the household towards women. These countervailing factors, namely time poverty, lower access to phones and lower digital literacy translate into lower engagement on DAPs by women.

For platforms to progress gender equity, they must be intentional about integrating women and a gender perspective into the design and roll-out of their innovations. Given that women significantly contribute to agricultural labour and a significant proportion of women in developing countries rely on agriculture for their livelihoods, it is imperative that the opportunities for digital platforms are equally targeted towards supporting women farmers and take into account the existing digital gender divide. To understand gender dynamics and social norms, platform developers need to be gender aware and transformative in their approaches. This means centring women equally as end-users by considering factors that influence decision-making power and the control of- and access to- resources and opportunities. Examples of approaches from best practice highlight twin approaches of internal interventions within the lead organisation and through targeted recruitment efforts. Internal interventions include efforts to ensure gender balanced executing teams, partnerships with entities that promote gender goals, clear KPI targets and the deliberate collection of gender-disaggregated data to contextualise behavioural dynamics and drive affirmative action. Recruitment based interventions include targeted approaches to make farmer recruitment gender sensitive - such as using female agents to reach women farmers through culturally sensitive means - strategic marketing to ensure visibility by all genders and quotas with direct incentives for the recruitment of female farmers.

Recommendations for Platforms and Digital Innovators

In design

1. **Engage women in product design** and business planning such as messaging, marketing and channel strategy
2. **Develop MEL plan** incorporating gender goals and gender disaggregated data and monitor these to identify the impact of the platform over time
3. **Align with your partners on gender intentionality** and prioritise partnerships with those who share and promote gender goals

In implementation

4. **Ensure female representation at all levels**, from internal management, partners, field agents and end users
5. **Embed gender goals into execution incentives**, for example, give agents higher bonuses for onboarding women

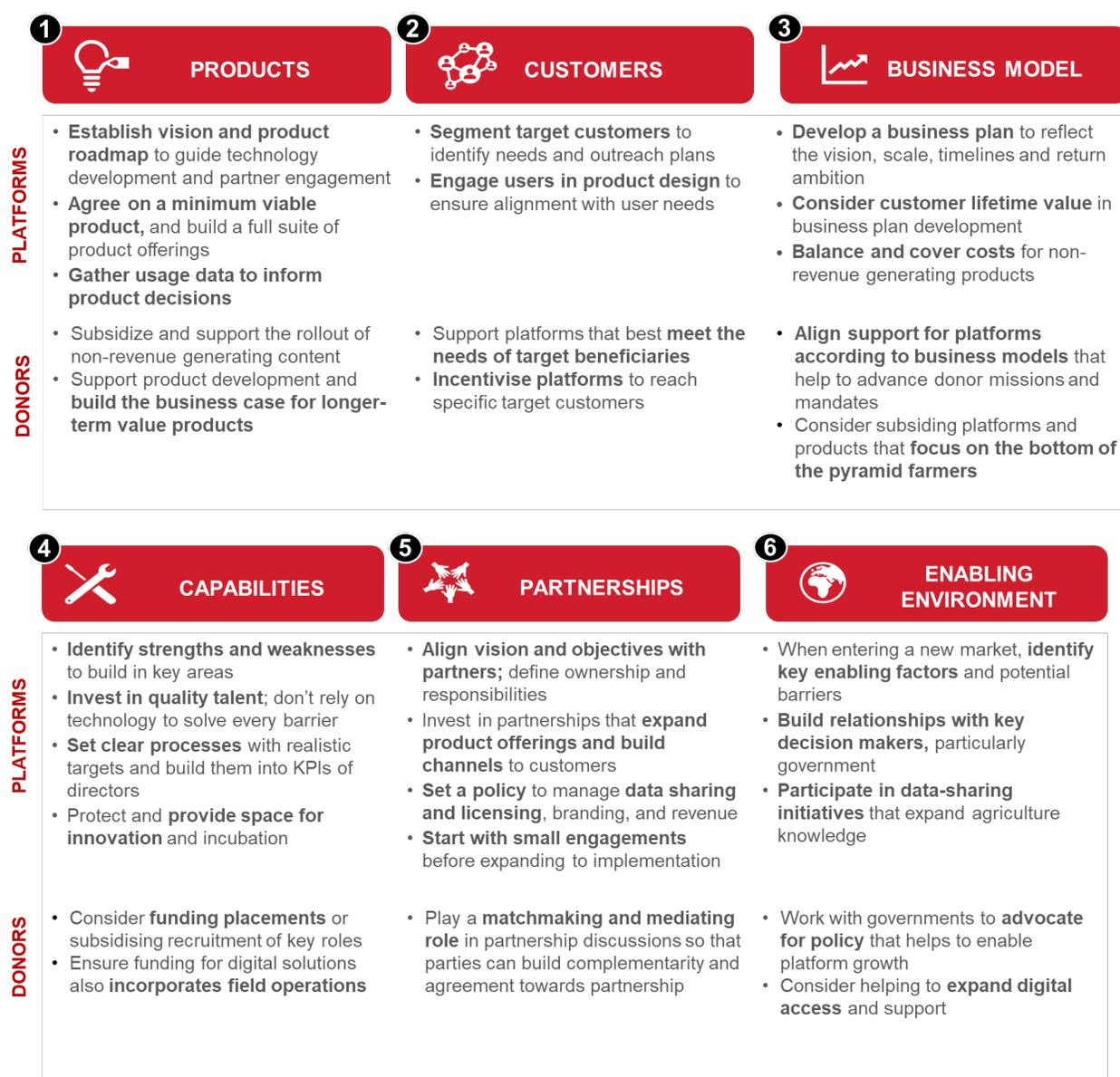
Recommendations for Funders and Policy Makers

1. **Provide dedicated support** to female entrepreneurs
2. **Consider subsidizing women's access** to products and finance, for example in offering agents bonuses for recruiting women to sign up to the platform
3. **Consider broader programmes that build gender equity** and contribute to wider gender equity goals, e.g. addressing lower levels of women's mobile phone ownership

8. Conclusion

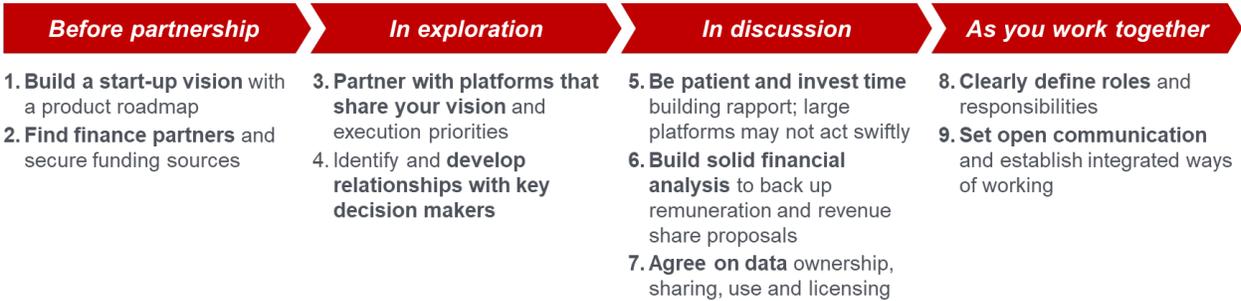
Digital Agriculture Platforms play a key role in addressing systemic issues for smallholder farmers around market access, skills development, and capital. There are limited innovations to address land issues, although soil testing devices are emerging. As DAPs grow across many markets in sub-Saharan Africa, there is an opportunity to learn from the journey of early platform developers and take forward key lessons in order to maximise future impact. Further, as donors look to support platform development to accelerate growth and development objectives, there are key lessons they can take forwards to inform their programme design. It is with this goal in mind that we summarise the key recommendations across six areas, below.

Figure 16: Summary of Platform and Donor Recommendations



Platforms also play a key role in supporting the growth of new technology innovators in the digital agriculture ecosystem, enabling their growth and scale. Tech innovators in turn help platforms to channel impactful solutions to smallholder farmers that enhance the platform’s impact. New tech innovators looking to engage with platforms can also learn from the early lessons of their peers and the partnerships we have thus far examined. Below, we outlined the nine key recommendations for tech innovators to get the best out of platform partnerships:

Figure 17: Summary of Tech Innovator Recommendations



Finally, DAPs are well placed to advance climate and gender goals but can play a bigger role in maximizing these outcomes by bearing in mind some key recommendations.

- Platforms need to be intentional in building climate and gender targets **into the design and implementation of platforms**, including recruiting women into product design teams
- Climate and gender both need to be **integrated into monitoring, evaluation and learning plans**
- **Pursuing partners that bring expertise in these areas** to broaden the platform’s understanding of these impact areas
- **Gathering data** to better understand and analyse climate and gender challenges for farmers, and the potential impact of platform interventions
- **Embedding gender and climate goals into execution incentives** – for example using the field force to provide training for sustainable agriculture, and targeting the onboarding of women

For climate, platforms play a role in raising climate finance and linking CSA technologies to credit products. For gender, the platform can also look to ensure female representation at all levels. Finally, donors can help to catalyse impact in these two areas through raising awareness, developing a business case, and tying platform funding to achieving climate and gender goals.