Transforming Smallholder Agricultural Productivity, Income and Resilience Through - Innovative Digitally Enabled Solutions:

Lessons Learnt from Sub-Saharan Africa

MERCY CORPS | AGRIFIN

Table of Content

1.0 About Mercy Corps AgriFin

Nearly 1.5 billion people live on less than $1.25 a day, of which 1 billion live in rural areas and are dependent on agriculture as their livelihood. In Sub-Saharan Africa, 70 million smallholder farmers (SHFs), over half of whom are women, produce over 80% of the food in developing countries.

70 MILLION

SHFs produce

over 80%

of the food in developing countries

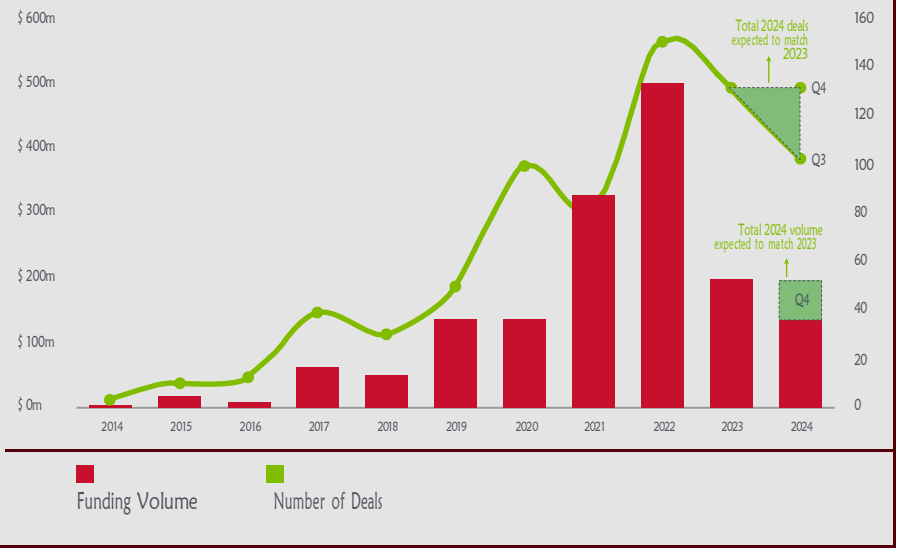
However, smallholders face continuous challenges, including land fragmentation, rising costs, climate change and other unexpected shocks, which undermine their ability to address food insecurity and risks of ending in absolute poverty.

Since 2012, Mercy Corps AgriFin and its partners have been working to address and alleviate some of these challenges by designing, delivering, and scaling digital solutions aimed at helping small-scale producers in Africa and Asia. These solutions focus on agri-finance, information services, and market access, supporting both public and private sector organizations, by improving access to inputs, lowering costs, and expanding market opportunities for farmers and investors.

Sub-Saharan Africa

According to Britter Bridges 2024 report

State of AgTech Investment



According to Britter Bridges 2024 report on the State of AgTech Investment **(figure above)**, AgTechs are concentrated in the Big 4 counties i.e **Kenya, Nigeria, Egypt and South Africa**, who mainly focus on agriculture. AgTech funding experienced a boom in 2022 with a sharp decline in 2023, which has been steady in 2024. There are at least 745 active AgTechs across the continent. More than half, or 426, have received funding since 2014 totalling more than $1.56 billion across 700+ investments. AgTech represents more than 30% of the total funding in the overall startup ecosystems, with less than 2% of the global fund going to Africa digital startups. In Africa, the current rate of adoption at 10% (between 5-17%) indicates that the sector has a long way to go to reach the 500m farmers goal.

Since its launch, AgriFin has focused on unbanking SHFs earning less than $2 per day. By partnering with governments, the private sector and development sectors, who have the same vision to empower small-holder farmers to start, grow and build their business, and be more resilient. AgriFin connects farmers to digital tools that

boost productivity, resilience, and income by 50%, with a special focus on women and youth. Whilst there have been notable successes in the design and uptake of digitally enabled solutions for smallholder farmers, the past couple of years has had unprecedented challenges for the organizations providing these solutions such as reduced funding as seen above, lack of data among others. It's a pivotal moment for Africa-focused stakeholders, to pause and reflect on the lessons learnt so far, to create an evidence base for decisions to be made on future investments and interventions. Below are some of the lessons garnered by AgriFin and its partners.

2.0 Key Lessons Learned

2.1 Digital Financial Solutions for SHFs

This section shares lessons on how digital financial services can be tailored to address SHFs' unique challenges in accessing financial products. Many SHFs lack traditional credit history, which limits their access to formal credit. Digital platforms can use alternative credit scoring based on transaction histories and other data to help SHFs qualify for loans, thereby promoting agricultural investment and productivity. The section also explores the benefits of bundling financial services—such as credit, insurance, and advisory services—on a single platform to meet SHFs' diverse needs and boost adoption rates. Partnerships between AgTech firms and banks play a critical role by addressing data privacy and safety concerns, ultimately facilitating greater access and adoption of digital financial services among smallholder farmers

2.1.1 Bundling of agricultural digital solution increases adoption and utilization of AgTech solutions

SHFs have shown greater demand for a range of interconnected digital services and products e.g., combining credit, insurance, advisory services and market access, on one platform. This has been essential for SHF who need to make decisions regarding production, market, and access credit while having a buffer or insurance against harvest loss and credit defaulting. Bundling overcomes the problem of choice overload where SHFs have to choose individual products and solutions and match these to the different needs they have. Providing bundled services addresses multiple challenges e.g. productivity and incomes, and resilience of SHF. Furthermore, offering a wide range of products improves adoption rates and effectiveness of AgTech solutions. For instance, CoAmana demonstrated that trade capital can be bundled with insurance to increase resilience of market vendors, especially against extreme weather events

2.1.2 Alternative credit scoring has the potential to unlock financing for SHFs

Most SHFs do not have traditional banking history hence get locked out of access due to the fact that they cannot be appraised for credit products. The use of credit score based on SHFs alternative transaction histories and other information can help improve the decision making on credit access, enabling more farmers to get access to loan products that would be used to improve farm capital and productivity. Understanding how to serve this segment and using these credit scores would in the long run have an impact on risk-based pricing therefore reducing the cost of access to credit.

Information on SHFs transaction history required for credit scoring, although widely collected, is still limited, posing a barrier to access to digital financial solutions. DigiFarm credit scoring suggests that over 90% of farmers scored poorly for high credit limits, an indicator that the issue might be bigger than just lack of information/data. Macro-level challenges include lack of national identification cards in Tanzania and Uganda especially among the SHF segment and particularly for women farmers. Of the available data, its accuracy, relevance, standardization and trust remain the biggest hindrance to credit scoring and access to finance.

Partnerships between AgTechs and banks can address this challenge, provided issues of data privacy, safety and ownership are addressed to assure SHFs of data confidentiality as evidenced by the Equity UG engagement or NCBA Loop platform. Identification of suitable partnerships on joint SHF onboarding would accelerate scale reach and also reduce cost of acquisition through use of digital solutions.

2.1.3 Increasing financial literacy and creating awareness of available digital financial services increases access and uptake of AgTech products and services.

Although a costly exercise, increasing marketing and awareness campaigns on the available digital products and services, has proven to bring more farmers on board. The more SHFs access and utilize digital financial and non-financial solutions on the market, the higher the economy of scale, leading to reduced cost and increased affordability to the digital products.

Additionally, low digital and financial literacy is a barrier to uptake of solutions. Players in the sector need to invest in providing education so that SHFs are both comfortable with accessing solutions digitally, but also have the basic financial knowledge needed before they can access products.

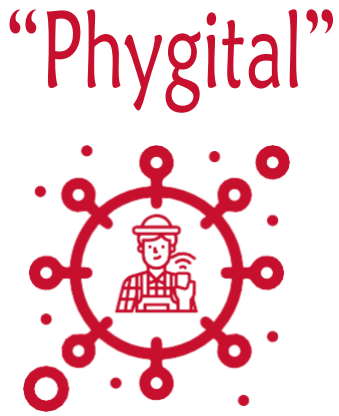
2.1.4 Sustainability and scalability of digital finance solutions

To achieve commercial viability and scalability of digital solutions, collaborations amongst Agtech players is needed to enable bundling, expansion and achievement of economies of scale. For example, Bundling loans with agricultural risk insurance helps safeguard both the SHF and the financial institutions whenever there is a climate related risk that would impact repayment of the loan hence making the product sustainable. Much could be achieved when there is automation of credit scoring tools to facilitate the advancement of loans to farm- ers as mentioned above.

2.2 Lessons on Digital Platforms, Marketplaces, and Last-Mile

This section shares lessons on how digital platforms have enhanced the efficiency of service delivery and market access for smallholder farmers (SHFs). These platforms help SHFs access essential agricultural inputs, market information, and improve productivity by connecting them to output markets. It emphasizes the importance of a multi-channel approach—using SMS, USSD, and apps—to broaden access and improve usability, particu- larly for low-literacy users and women farmers.

The section also highlights "phygital" approaches, which combine digital services with physical support through field agents, fostering trust and expanding service reach. Addressing how logistical challenges of deliver- ing physical goods to SHFs remains crucial, with digital platforms needing to consider local zoning and informal market structures to avoid disrupting supply chains



2.2.1 Digital platforms increase efficiency of last mile delivery and access to marketplace

Digital platforms have improved efficiency of last mile delivery, being able to indiscriminately reach both men and women, leaving no one behind. Digital platforms have streamlined input and output market access, improving farmers' productivity and income as was experienced by NCBA Loop, who improved rice farmers output from an average of 15 to 40 bags per acre, and Loop aims to improve the average to consistently 35 bags per acre, this has seen the average farmer's income improve from KES 5,000 to KES 75,000. However, the full potential is yet to be realized as more is required for physical items that require logistics to reach their last mile. The design process and costing of Digital Platforms should take note of the existing zonings controlled by an informal workforce to prevent destabilization of the supply chain

2.2.2 Digital platforms require multi-channel approaches in design to effectively deliver its products and services.

While bundling of services has been noted to lead to better outcomes for SHFs, using a variety of digital access points to access solutions (e.g.USSD, SMS, Apps) ensures wider adoption, especially for women and low-literacy farmers. Moreover, phygital approaches (combining both digital and physical) have proven to be quite effective in reaching SHFs as this establishes trust and provides a way for in-person interaction which is still valued by farmers, e.g KUZA Biashara approach of having agripreneurs as field agents and providing educational information through various channels has improved their reach enable them to onboard 6.5million farmers. Sharing field agents with other initiatives offering other services and goods has also proven to be cost effective and leads to expanded reach and faster growth.

Digital solutions built on USSD as an access channel are more accessible to farmers regardless of the type of mobile device they have. USSD Menus are easier to design, build, are much more affordable and easy to navigate through various options on the Menu provided. Despite this, the number of characters fed or received at a time in USSD is limited. This limits the amount and clarity of information received. This limitation can be supported by alterna- tive channels such as Interactive Voice Response (IVR),and mass media like radio and TV, as a one-way communication channel from the agent. However, these preferred backup chan- nels often fall short of interoperability and incorporate feedback loops.

Additional challenges facing the available channels include low basic and digital literacy, affordability of airtime and data, type of gadget owned, the amount of information consid- ered satisfactory, form and format of the information, digital infrastructure availability, palat- ability of the content, best timing to send messages etc. These factors all need to be consid- ered and a multi-channel approach should be adopted to address most of these concerns to provide effective services. Models should consider incorporating features such as toll-free services to encourage feedback and requests for clarity from SHFs e.g Ethiopian Agricultural Transformation Institute's 8028 Farmers Hotline's agricultural advisory services, and be able to convert their advisory services in SMS or other digital formats.

2.2.3 Aggregating farmer data across platforms can enhance product development, market access, and financial solutions.

Collaboration among AgTechs and other providers in acquiring, storing, updating and managing farmers' data would result in a more robust dataset of farmer profiles. Not only will this be cost effective, but it will enhance efficiency in solutions development and implementation. Currently the limited available data is being used by certain private companies. However, for AgTechs and other innovators to compete and keep up with advancing technology such as AI, a variety of aggregated data is required. A good example of data sharing in the sector is the DAT World Bank platform that initiated a data hub that would allow data sharing among ag-innovators. Design of effective data sharing policies would safeguard each provider's effort on their part of data acquisition,storage, management and ethical use.

2.2.4 The most effective Digital platform models in reaching smallholder farmers are those ones which are impactful, scalable and financially viable

In order to design the right digital platform, it needs to meet the unique requirements of different farmer groups, as opposed to adopting a one-size-fits-all approach. Building this model will require collaboration between governments, NGOs, and agribusinesses. Collabo- ration and transparent integration between the different stakeholders along the value chain (MNOs and MTN) might be effective as they have a large database of rural users, trusted brand and digital solutions to reach smallholder producers. For example, MTN is open to collaborate with AgTechs on the ecosystem to support onboarding and have close touch points with small holder farmers. Existing policy environment affects the effectiveness of the digital platform model. There is a push to develop Digital Public Infrastructures (DPI) such as Agristack Solves in India. Agristack has been enabling data standardization, catalyzing interoperability and accelerating the ecosystem, while having a wide reach allowing farmers to access loans within minutes.

2.3 Lessons on Digital Climate-Smart Agriculture (CSA) Solutions

This section shares lessons on how Digital CSA (DCSA) tools have enhanced smallholder farmers' resilience to climate impacts. DCSA provides vital data-driven insights through tools like early warning systems, weekly weather forecasts, and climate-linked insurance, which support farmers in adapting to climate change. The section illustrates how bundling DCSA solutions with financial and advisory services further promotes resilience, as farmers receiving multiple services report greater perceived resilience than those with access to only one service. The section emphasizes the need for localized and context-specific information, making weather, pest control, and best agricultural practices more relevant and actionable for farmers. Additionally, partnerships between public and private entities are essential for scaling DCSA solutions effectively and afford- ably, especially in remote areas

2.3.1 DCSA solutions are key to building resilience of SHFs

Climate-smart agriculture (CSA) solutions provide data-driven information that enhances smallholder farmers' decision-making capabilities. Digital CSA (DCSA) tools, such as weekly forecasts, early warning systems, and climate-linked insurance, enable farmers to anticipate climate impacts and build resilience. According to a 60 Decibels report, "Farmers whose access to extension or weather information increased because of their partner company are more likely to report increased perceived resilience to a future shock due to the company."

Bundling CSA with financial and advisory services further enhances the adoption of digital financial services (DFS) and other agricultural technologies. The same 60 Decibels report highlights that "Farmers receiving only one service from the company are less likely to report increased resilience than those receiving two or more services." This demonstrates the importance of integrating multiple support services to maximize resilience among smallholder farmers.

2.3.2 DCSA should be contextualized and localized to provide tailored and relevant information

Providing SHFs with actionable, localized data on climate risks and market trends is crucial for improving farm productivity and sustainability. Contextualized and tailored weather and advisory services enhance data driven insights needed for precision agriculture, conse- quently improving the value provided by digital platforms. Recruitment of field teams from local communities who understand the local context and language to provide comprehen- sive training and simplify activities in the field also enhances the experience of farmers while interacting with DCSA products and services.

Weather information alone is not enough for climate resilience, inclusion of pests and diseases control as well as good agricultural practices among other information is important for farmers. Sprout, the open content digital agricultural platform, offers a rich database for farmer facing organizations to get digital-ready information to disseminate to farmers in multiple value chains .

2.3.3 Collaborative partnerships in delivering CSA solutions

Similar to the bundling approach for DFS solutions, public-private partnerships are essential for delivering cost-effective CSA solutions to SHFs, especially in remote regions. Finding partners with similar objectives, partnership process, data sharing culture and revenue model is the key components for how DCSA solutions can enhance digital platform service provider products, reduce risk, and increase business performance. An example is the work being done by Sprout (in collaboration with KALRO, different Ministries of Agriculture (moAs) and private FFOs) for the dissemination of GAP.

Despite having stronger adoption at earlier stages of the product life cycle, growth, uptake and adoption of the DCSA services remains elusive, lagging between 5-17% (CTA report 2019). Utilization of Agribusinesses to provide agronomic advice, training, and support will spur adoption and enhance value that digital channels provide to SHF. Connecting SHFs to input, off takers, and other resources holds the key to spurring adaptation of DCSA. Invest- ment will be needed to integrate various services from agribusiness side while providing remote support and troubleshooting.

2.4 Lessons on Gender and Agency in Digital Agriculture

This section explores the impact that digital agriculture solutions have had on empowering women farmers. Digital platforms allow women to access agricultural and financial services that help them overcome time constraints and competing priorities. Women-focused solutions, like micro-loans and savings plans, have been shown to improve financial inclusion and resilience for women smallholders.

The section emphasizes the need to design digital products specifically for women, as these products can bene- fit both genders but may not work as effectively in reverse. Programs that mobilize women participants and employ female agents increase adoption rates. Strategies such as homestead-level training sessions, which reduce travel time, are highlighted as effective approaches. Additionally, multichannel approaches, including USSD, IVR, and ATM cards, provide alternative access for women with limited digital literacy or resources.

Incentive models, like loyalty programs and engagement with women's savings groups, have also proven effec- tive in increasing women’s participation in digital agriculture. Continuous research on gender impact remains crucial to shaping effective strategies for enhancing women’s productivity and resilience through digital solutions

2.4.1 Digital solutions provide women with the opportunity to participate in agricultural production, enhancing their productivity, income and resilience.

Digital solutions are key to overcoming and managing time and othe r competing priorities that women smallholder farmers face such as cutting down the time needed to go to the back to access loans.. Digital platforms offer women opportunities to access and use solutions that can improve their agricultural productivity and increase their resilience.

Providers need to design products with women in mind. Our work with different providers has shown that where digital solutions are designed for women, men are also able to access and use the same products. Designing for women does not exclude men whereas the reverse does not work.

2.4.2 Deliberate efforts aimed at creating women centred products, awareness, mobilizing women participants and recruiting women agents improved women participation.

Women-centered solutions like micro-loans and savings plans, tailored to women, significantly enhance their financial inclusion, resilience and utilization of digital and non-digital solutions. Deliberate effort must be made to mobilize women to participate in digital and non-digital financial projects. When left on their own to join, several barriers hinder their participation including digital literacy, culture of dependence on men and spouse approval, lack of identifications, and misinformation on perceived usefulness. An example is Shamba Pride project, which made efforts to improve the agro-dealer onboarding protocol, by specifically targeting women-owned shops. This ensures that women have equal opportunities to participate in the project.

Extension at Homestead level: Holding training sessions and demonstrations on their own farms or those nearby gives women time to complete other competing household chores as it cuts down on travel time. Leverage women's groups which are formed around welfare interests has been useful to reach women effectively for training and increased awareness of opportunities available to improve agricultural practices.

2.4.3 Multichannel approach to financial services access and utilization are crucial for reaching women (ATM cards, USSD, among others)

Understanding the plight of small-scale women producers is critical. In cases where they do not have mobile phones, providing women smallholder farmers with alternative channels such as ATM cards linked to their bank accounts facilitates easy and secure access to their funds. The proliferation of Agency Banking means reduced travel distance to bank branches and ATMs as the women can walk to nearby agents and use their cards to conduct cash-in, cash-out and transfer services

Channels like USSD allow women who might not have access to a personal device to still have access to financial services including financial literacy as they can borrow a handset and dial the USSD code to access services.. The USSD interface is particularly effective for reaching women with lower digital literacy levels, as it can be designed with simplified interfaces and multiple language options, making financial services more accessible and user-friendly.

IVR is a useful channel for women who cannot read as it uses voice to share information from the provider. It also has the advantage of being customizable to different languages.

2.4.4 Loyalty programs as an incentive model for the use of digital advisory platforms is an effective method for encouraging women participation.

Incentivizing farmers to use digital tools more frequently e.g. through rewards points for successful learning or sale of produce, which can be redeemed for product discounts, is a great model for engaging women smallholder farmers. This approach has been found to encourage users to adopt and actively utilize these services and tools, further contributing to their economic empowerment and resilience. For example Lersha has incorporated this for women agents in Ethiopia.

2.4.5 Leveraging women's savings groups to provide digital financial services has proven effective in scaling financial access for women.

The use of points of entry where women are and trust such as village savings and loans associations (VSLAs), cooperatives as witnessed through Copia expansion GTM, boost women participation. Similarly, HCD throughout product development and policies on digital and financial literacy at the earlier stages is important. Support on implementation of gender toolkit to rework strategy to reach women smallholders, onboarding female agents (both government and ACRE agent). Reworking above the line and below the line marketing material to have more gender inclusive images.

2.4.6 Continued research on gender impact holds the key to evidence base for gender strategy in digital solution.

Conducting gender impact studies such as Mshamba's gender impact study has allowed them to identify priority needs and actions for scaling their activities and increasing wom- en's participation. This highlights the importance of gender-inclusive approaches as well as continuous monitoring and measurement for successful agricultural initiatives.
HelloTractor highlights how having gender disaggregated data can bring out trends on behaviors from a gender lens as well as lead to tailored mechanization services and products for women.

2.5 Lessons on Cross-Cutting Issues in the AgTechs Ecosystem

This section captures the lessons and recommendations for addressing systemic challenges and strategies essential for the sustainable adoption and scaling of digital agriculture solutions. The section highlights afford- ability as a key issue for smallholder farmers (SHFs), emphasizing partnerships, subsidies, and cost-sharing models as effective strategies to reduce costs and improve access to digital services. It also discusses how subsi- dies, such as those for insurance, can facilitate uptake and create awareness, with gradual reductions over time allowing SHFs to cover costs independently.

Additionally, the section covers data sharing and protection, underscoring the need for standardized practices between AgTechs, financial institutions, and governments to enhance service access. Collaboration in data collection and content sharing can lead to economies of scale and structured partnerships that expand market reach.

Public-private partnerships are highlighted as crucial for scaling digital solutions, with governmental collabora- tion enhancing credibility and expanding reach to rural farmers. The government's involvement provides a foundation of trust, essential for the broad adoption of digital tools, such as mobile money platforms. Overall, Section 2.5 provides a framework for addressing foundational issues within the AgTech ecosystem to foster greater impact and reach among SHFs

2.5.1 Affordability and Active Use

2.5.1.1 Digital solutions must be affordable to SHFs to ensure sustained adoption.

Partnerships, subsidies, and cost-sharing models are strategies which can be deployed to enhance affordability, active and sustainable use of digital solutions. Introduction of subsidies in some cases which offer bundled services to farmers in cluster service delivery models will not only help to achieve economies of scale but also create efficiency in the service value chain especially for products with low uptake e.g. insurance. PULA subsidy for insurance in Ethiopia where insurance premium costs were covered through subsidy. This helped with insurance uptake and awareness to farmers on impor- tance of insurance The subsidies were then reduced gradually for farmers to cover all the premium costs.

Similarly, the use of credit score data reduces the risks associated with lending and insurance which reduces the cost of credit and insurance services. This eventually improves affordability and use.

Leveraging on existing structures to create awareness and sell digital solutions reduces operational costs significantly. Similarly, this could be strengthened by partnerships that create synergy among players in the industry.

For digital advisory services/ information, these can be initially provided as a public good, while packaging information which meets the needs of SHFs. Additional customized information and services can then be offered as add-ons which can then be priced at a premium. Another model is one where a certain number of subscriptions or level of access of information is free then additional information requested is charged a subscription fee.

Re-evaluation of business models is equally important for improving affordability and active use. Intro- ducing various premium payment options and offering competitive commissions to agents and cham- pions while balancing reasonable margins for the business is a delicate balance.

2.5.2 Data Sharing and Protection

2.5.2.1 Best practices for platform partnerships in data sharing and analytics between corporates, digital innovators, and other partners

Standardizing data collection and sharing practices between AgTechs, financial institutions, and governments can drive better access to services for SHFs. There is a need for collaboration on content creation and sharing focused on economies of scale and competitive advantage among partners. This will pave the way for structured agent-sharing models that increase scale opportunities among ecosystem partners.

2.5.3 Public-Private Partnerships

2.5.3.1 Collaboration with governments enhances credibility, s cales digital solutions, and improves outreach to rural farmers.

Taking advantage of existing government field forces, developing joint work plans and use of existing partner infrastructure such as SACCOs/POS enabled more reach of SHF and enhanced effectiveness and efficiency in service delivery.

Public sector research institutions are key sources for digital content especially advisory content, for example, partnership with KALRO in Kenya has led to access to digital content e.g Sprout collaboration on their Data Hub and Data Sharing with DAT cohort and WB.

Similarly, partnerships with the public sector can support/facilitate the access of key tools and infrastructure (mobile broadband), and access to segments of farmers, effectively demonstrating the value and gap they are addressing. (PULA, Hello, Lersha, ATI)

Furthermore, the government's support or endorsement can build a level of trust and reliance on certain products and tools - Example Forced used of mobile money(telebirr) stifles competition but quickens rate of adoption

ANNEX 1: LEARNING GAPS

1. Learning Gaps

1.1. Gaps on Digital Credit

1.1.1. Statement of the problem 1

Credit score remains the most important evidence base for decision making in issuance of loans to farmers. Financial institutions remain with limited credible data to form credit score for SHF. While some AgTech may have some data sets which could be used to create profiles of SHF and set credit score, the compatibility, reliability, and quality of the dataset do not match those of the financial institutions.

Similarly, low uptake of National identification cards by SHF especially in Uganda, Ethiopia, Tanzania remain a hindrance to credit access. Furthermore, low financial literacy among SHF is equally an impediment. While data from Agtech could be used to support financial service access, financial institutions doubt the credibility, accuracy, conformity, reliability and quality of the datasets and hence limitation for the use of the data to form SHF profile and credit score.

1.1.2. Learning Guiding Question

i. How could we scale and sustain financial access with low financial literacy, lack of IDs and lack of reliable credit score among others?

ii. What needs to be done by the AgTechs on their data collection process which will make their data reliable, accurate, improve quality and credible for use by financial institutions to create credit score for SHF

iii. How can agriculture ecosystem partners support uptake of national identity document registration among SHF to increase access to formal financial services?

iv. What are the most efficient and cost-effective ways through which financial institutions could use to improve financial literacy among SHF and create demand for financial services

v. What are the most efficient but cost-effective ways through which financial institutions could improve digital finance solution literacy among SHF

1.1.3. Statement of the Problem 2:

Where a manager of a financial institution is presented by a decision to make on issuance of USD 20,000 loan to either one individual businessman or 20 SHF where each need USD 1,000 as Agricultural loan, SHF usually miss out because of the well-known reasons such as risk involved with agricultural production, level of effort required in issuance of the loan, repayment schedules among others. It remains that any money allocated by any financial institution for agricultural loans are usually either an excess after saturation of other sectors financing amounts requirements

i. How could financial institutions be incentivized to prioritize agricultural loans, especially to SHF through digital platforms over other commercial loans? How can digital solutions and platforms incentivise banks to include this segment in their target markets?

ii. Which business model would work for financial institutions with SHF loans, and which will reduce the risks foreseen by financial institutions on agricultural loans?

1.2. Gaps on Digital Insurance

1.2.1. Statement of the problem 3:

Digital Insurance remains the only financial buffer for SHF against agricultural losses due to climate change effects. Despite its importance, the uptake remains low due to low digital insurance literacy levels, low access to mobile phones, cost of insurance & availability of subsidies, trust & transparency, and willingness & ability to pay by SHF. The low access to mobile phones is attributed to the cost of the gadgets, digital literacy and socio-cultural barriers

i. How could we scale and sustain insurance uptake among SHF?
ii. Which models could be cost effective and efficient for dissemination of Digital agricultural insurance literacy information among smallholder farmers
iii. What specific interventions need to be undertaken to improve insurance uptake?
iv. What product and/or service bundles would improve insurance uptake?
v. While the cost of mobile phones is largely affected by the taxes imposed by the state on the importation of the phones- something which requires advocacy and legislation change- what are the other alternative ways through which mobile phones can be made accessible to women?

1.2.2. Statement of the problem 4:

Up until now, the available insurance solutions mainly focus on weather related losses. While weather related risks are important, other climate change effects and risks such as pests and diseases, hailstones, among others are equally important for SHF.

i. What other risks do SHF demand insurance against?
ii. Which initiatives would increase SHF awareness of other crop insurance products? How can limitation of affordability be resolved (e.g. group cover)?
iii. How would this affect the cost of insurance for SHF and women?

1.3. Gap on Digital Payments

1.3.1. Statement of the problem 5:

Digital payment is embraced in almost all the business sectors however, the SHF sector has not fully adopted it. This is for both payments for input and receiving payments for output. The volume and amounts handled by SHF is generally low and the number of transactions is generally high. Digital payment is also affected by the low access to mobile phones, low digital literacy, and low access to national Identification cards.

i. How could we scale and sustain digital payments systems for SHF?
ii. How could digital payments be used to advance other services e.g alternative data for credit score, tailor made payments even for groups (Dalberg pieces)?
iii. Which other alternative ways could digital platforms use for verifying payment actors along the SHF value chains other than the National ID cards?
iv. Which strategies and models could be used to improve financial payment digital literacy level among SHF and women?
v. Other than legislation on tax exemption on Mobile phones and related digital access, what are some alternative solutions which could improve access to mobile phones among SHF and women to improve digital payments?

1.4. Gaps on Digital Savings

1.4.1. Statement of the problem 6:

While digital saving remains one of the most secure, accessible and easy to use for rural SHF, its adoption and use is under-achieved. Despite savings and transaction data being a reliable dataset for setting credit score, SHF saving data is not available with financial institutions because of a poor saving culture, low access to mobile phones, low digital literacy and low financial/ savings literacy. In some instances SHF savings are in the form of harvest stored at their homes, which is unquantifiable for purposes of credit scoring.

The ratio of SHF conversion of produce to cash and to saving is very low. This is usually because many SHF produce for subsistence and if any surplus is left, marketing challenges devalue the produce leaving the farmer with too little money to save. Similarly, SHF and women also lack the saving culture

i. What digital solutions and models could be used to improve SHF and women saving
ii. What social behavior change strategies could be used to build a saving culture among women and SHF?
iii. What kind of model would work for the marketplace and saving bundled services?
iv. How could the saving and transaction data from AgTechs be used to build credit scores for SHF and women with financial institutions (banking partners, AFEX, Ensibuuko, Equity, Loop DFS, FSD)?

1.5. Gaps on digital Platforms, Marketplaces and last mile

1.5.1. Statement of the problem 7:

Lack of awareness, low digital literacy, unclear value proposition and logistical challenges remains the significant hindrances to scaling and sustainability of market platforms. While there is a need for human intervention between the technology and the SHF for improved adoption and use, the pathway has proved to be costly but effective.

While some markets like Kenya have a working digital payment system and marketplaces for other goods and services, the implementation of this strength in agriculture and for SHF remains elusive. This is due to the lack of a proper value proposition for the marketplace, low awareness, poor access to digital tools, seasonality of agricultural production, missing standard of measure for both quality and quantity, and a lack of verification of product before delivery. How can these problems be solved?

i. What are the digital ecosystem interventions required?
ii. What are the partnership level interventions required
iii. What are the smallholder farmer level interventions required?
iv. What product bundles should be paired with marketplace products to add value to farmers and drive the full potential of the digital platform?
v. How could a standard quality and quantity verification system be introduced in the digital marketplace and last mile for agricultural goods.

- Case studies- FtMA, DigiFarm, Twiga, CoaMana

1.6. Gaps on Digital Climate Smart Agriculture

1.6.1. Statement of the problem 8:

Digital Climate Smart Agriculture remains one of the most important information, knowledge and technologies to be shared with SHF in supporting their decision making. Despite the proven benefits of CSA practices, adop- tion rates among smallholder farmers in many parts remains low. Challenges include limited awareness, lack of access to resources, and social/cultural resistance.

Similarly, awareness is low despite government agencies having the mandate to provide advice and policy on capacity building, infrastructure and resources on how to handle different climatic situations. Up until now CSA information provided to farmers is mainly weather information while leaving out pests and diseases, hailstones among others. Climate related information provided by the CSA usually is not palatable for SHF. While farmers need actionable solutions, CSA provides information such as weather information which the SHF do not have the intellectual capacity to process and support their decision making. How can we increase the adoption of climate-smart agriculture practices among smallholder farmers in Africa? Consider barriers such as lack of information, financial constraints, and cultural attitudes. What role can technology, policy, and partnerships play in overcoming these barriers?

i. What should the private sector and government agencies' partnership for CSA content generation look like?
ii. What process and method could help CSA product and services creators to identify SHF pain point and develop products which fit their needs
iii. How can the government and private sector partner on dissemination of CSA?
iv. What other product and service bundles could be put together with CSA solutions to promote its adoption and use?

1.6.2. Statement of the problem 9:

Access to finance is a significant hurdle for farmers looking to adopt CSA practices. Traditional financial institu- tions often consider smallholder farmers high-risk, leading to limited access to credit and insurance (reference studies on the linkage between finance and adoption of CSA).

i. What financing models can be used to support the adoption of climate-smart agriculture practices in Africa?
ii. How do you package climate smart information to address farmer needs and add value to their work?
iii. How could we add pests and diseases, hailstones, soil information to DCSA?
iv. Which business models would best work for DCSA platforms? (Sprout)
v. Which product or service bundles would best work with DCSA platforms?

1.7. Gaps on Digital Advisory services

1.7.1. Statement of the problem 10:

While digital extensions remain the most viable and cost-effective pathway, many farmers have low digital literacy, low willingness to pay, low ability to pay, and inability to afford digital gadgets. On the other hand, traditional extension services have low agents to farmer ratio. While partners and government institutions have good advisory content, digitization and sharing of these content remains elusive. Similarly, where digital advisory services are offered, there is a lack of standardization of content from different service providers. these has led to farmer fatigue

i. What would be the best arrangement for digitization and (dissemination) standardization of digital advisory content among partners?
ii. Which business model would best work for a digital advisory platform / for sustainability when it is offered as a public good?
iii. In the case that the digital advisory services are offered as public goods, which bundle services can benefit the platform and add value to the farmers?
iv. Where digital advisory services is offered as a public good, who claims the ownership, IP, hosting among others

v. Which digital platform would best work with the farmers for DCSA? (Considering affordability, literacy, content type, etc)

1.7.2. Problem statement 11:

While the public sector generates numerous datasets which could support content for advisory, marketplace, DCSA, Digital Financing and gender inclusion, this information remains unutilized in the shelves. How could we improve use of public sector datasets to make the data actionable and impactful, ready to be leveraged for supporting initiatives of small-scale producers.

i. Which datasets are available and in which government institutions
ii. What components of the dataset would be required to enhance Digital financing, advisory services, marketplace, CSA and gender
iii. What are the requirement sto access and harvest the datasets?
iv. What is required to utilize the datasets to develop products for SHF?

GLOSSARY AND ACRONYMS

AgriFin - Mercy Corps AgriFin; an initiative supporting smallholder farmers by connecting them to digital tools for productivity, resilience, and income.

AgTech - Agricultural Technology; digital tools and innovations designed to improve agricultural efficiency and productivity.

CSA - Climate-Smart Agriculture; practices that increase agricultural productivity, enhance resilience to climate change, and reduce greenhouse gas emissions.

DCSA - Digital Climate-Smart Agriculture; digital tools that support climate-smart agricultural practices.

DFS - Digital Financial Services; financial products provided through digital channels, including mobile phones and the internet.

DPI - Digital Public Infrastructures; foundational digital systems and services that enable the delivery of public and private digital solutions, often built for inclusivity, scalability, and secure access.

IVR - Interactive Voice Response; a technology that allows farmers to interact with a digital system through voice commands, often used for informational services.

KALRO - Kenya Agricultural and Livestock Research Organization; is Kenya's principal public research institution focused on advancing agricultural and livestock research to boost productivity, sustainability, and resilience in Kenya's agricultural sector

KES - Kenyan Shilling; currency of Kenya.

MNO - Mobile Network Operator; companies providing mobile telecommunication services.

NCBA Loop - A digital banking platform in Kenya focused on enhancing agricultural productivity.

SHF - Smallholder Farmer; farmers who manage small plots of land, primarily for subsistence or small-scale commercial agriculture.

SMS - Short Message Service; A text messaging service component of most telephone, internet, and mobile device systems, allowing for short text-based communications between devices.

USSD - Unstructured Supplementary Service Data; a communication protocol used by mobile networks for interactive, text-based information sharing.

VSLA - Village Savings and Loans Association; community-based groups that provide savings and loan services to members, often in rural areas.

WB DAT – World Bank Data Aggregation Tool; a platform designed to aggregate and share agricultur- al data to support innovation and digital solutions for smallholder farmers, especially in emerging markets.


MERCY
CORPS
AGRIFIN