

DIGITAL FINANCIAL TOOLS FOR WOMEN SMALLHOLDER FARMERS

A review of the evidence

*Prepared for the Digital Farmer Services (Agricultural Development) and
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EXECUTIVE SUMMARY

Smallholder farmers have limited access to financial services, which constrains their ability to manage risks, invest and expand production, and improve their livelihoods and well-being. Digital financial services (DFS) and digital platforms have the potential to offer both women and men farmers increased access to financial services and products by overcoming geographic and physical barriers and high transaction costs, as well as by increasing transparency and trust in financial systems. However, the evidence suggests that the gender gap in access to and usage of DFS has not narrowed over the past decade. Women continue to face additional constraints compared to men, such as denial of land rights and lack of agency in household decision-making, that contribute to this and other gender gaps. DFS and digital platforms are not solutions to deeper power imbalances driving gender inequality, but provide promising avenues for women farmers who want access to finance and tools to support their livelihoods.

This report presents an evidence review of DFS barriers and opportunities for women smallholder farmers, with a focus on those women farmers that are transitioning to more commercially oriented market production – the target population for the Bill & Melinda Gates Foundation's Agricultural Development Program Strategy Team. Given that DFS is an emerging field, the report seeks to identify good practices to inform the design of future DFS programming aimed at women farmers. The evidence review finds that measures of financial health are more impactful drivers of women farmers' financial inclusion than characteristics of their agricultural production, and recommends provisioning of DFS accordingly.

The broader financial inclusion literature provided insights to relevant financial services for women smallholders. Loan disbursement and collection, market pricing, and agricultural extension appear to be most relevant for all women farmers, regardless of the size and nature of production. As for barriers to access finance, both supply- and demand-based factors contribute to the gender gap,

with risk, liquidity, privacy concerns, trust in and ease of use of financial systems, and access to technology emerging as important gender-related elements. Lack of formal identification is another limiting factor for women farmers, hindering their ability to access even basic services. Financial institutions also continue to be gender-blind or have gender-biased practices. Additionally, social and cultural norms, which dictate men's and women's economic roles, behaviors, choices, and preferences and affect intrahousehold dynamics, are at the root of many issues that women face. As for opportunities to improve financial inclusion, digital platforms have the potential to address some of the barriers faced by women smallholders, including access, bargaining power, privacy, opportunity cost of time, timeliness of financial transfers, safety, and mobility. Finally, using gender-transformative approaches to digital financial inclusion can address root causes of gender gaps by dealing with the underlying gender inequalities embedded in the systems and enabling environments in which women farmers operate.

THE REPORT MAKES FIVE MAIN RECOMMENDATIONS.

- 1.** Invest in bundled and gender-customized DFS and products, in response to the identified financial needs and characteristics of women smallholder farmers.
- 2.** Leverage the strong role played by rural village loan and savings associations to strengthen the financial inclusion of women smallholder farmers.
- 3.** Ensure that digital financial products and services are designed from a gender and intrahousehold perspective, including targeting men in the household, and considering social and cultural norms.
- 4.** Leverage existing successful DFS providers so that they better target women smallholder farmers.
- 5.** Contribute to research by building empirical evidence of what works to increase the digital financial inclusion of women smallholder farmers.

INTRODUCTION

Lack of access to credit and other financial products is a longstanding and well-documented problem for smallholder farmers – both women and men. According to the Initiative for Smallholder Finance, credit provided by informal and formal financial institutions, including value chain actors, currently meets only an estimated USD 50 billion of the more than USD 200 billion need for smallholder finance in the regions of sub-Saharan Africa, Latin America, and South and Southeast Asia (Goldman, 2016). Insurance for smallholders is also limited for most smallholder farmers, despite their frequent exposure to crises and shocks. Lack of collateral, remoteness and dispersion of clients, high transaction costs, lag time between investment needs and expected revenues, risk of pests and diseases, the small size of farms and individual transactions, and limited transportation and communication infrastructure are among the reasons given for small farmers' limited access to financial products and services (Adesina et al., 2014; Zins & Weill, 2016). Women farmers historically have faced more barriers to finance and related products than men, with limited access to land and other forms of collateral required by formal lenders being one of the most intractable constraints (Gammage et al., 2017).

Digital financial services (DFS) have emerged as a potential response to financial exclusion by easing access to credit, savings, payment mechanisms, remittances, and insurance. These innovative platforms can help overcome barriers related to geographic and physical barriers and high transaction costs, as well as increase transparency and trust in financial systems. With over 1.2 billion registered mobile money users across 96 countries (GSMA 2021) and 21% of the adult population in sub-Saharan Africa having a mobile money account (Pazarbasioglu et al., 2020), digital services are a potential game changer. The COVID-19 pandemic and the need for physical distancing has put an even greater emphasis on mobile platforms by allowing direct transfers and remote transactions (Agur et al., 2020). Box 1 describes the principal digital financial products and services of relevance to smallholder farmers.

Digital financial tools have the potential to accelerate agricultural transformation for smallholder farmers by offering tailored information that enables them to optimize their production, gain better access to appropriate products for their farms, and achieve new linkages with markets for their goods. For the first time, it is possible to capture data from individual farms and fields, combine them into macro-level data sets, and use those data sets in increasingly cost-effective ways.¹ Additionally, reaching more farmers in remote, rural areas with low population density is now more cost effective, as digital technology allows organizations to create more sustainable and scalable models for service delivery. More farmers are now being reached with services (including via digital platforms) that are increasingly customized to meet their needs and available on demand.² With 94% of the world's population living in areas with broadband coverage, and more than 4 billion people (51% of the world's population) using the mobile internet (GSMA State of Mobile Internet Connectivity 2021), the ability to reach even the most remote farmers with useful information, content, and financial services is increasingly within reach.

Digital technology also has the potential to increase women's economic empowerment by offering women new opportunities for savings (World Bank, 2017b), access to markets, lower product costs and credit (Sicat et al., 2020). Digital platforms can help women build networks and social capital, which, in turn, can help them gain access to financial services (Crittenden et al., 2019). Digitized cash transfers as part of G2P programs (payments which increased significantly during COVID, especially by governments who were set up to deliver cash transfers digitally) are increasingly being designed with an intent to boost women's economic empowerment. Through digitizing predictable income streams, low-income women can gain familiarity with the digital ecosystem by ensuring they have transaction accounts from which they can save, send money to others, and have access to credit.³ Pay-as-you-go (PayGo) is emerging as a new class of asset finance by providing low-

1 CTA. [“The Digitization of African Agriculture Report, 2018-2019.”](#) p. 137.

2 Ibid, p. 38.

3 The World Bank's [“Digital Cash Transfers in Times of COVID-19, Opportunities and Considerations for Women's Economic Empowerment”](#) report (Zimmerman et al., 2020).

income households with lease-to-own assets, such as solar power electric outlets, LPG gas canisters, and cookstoves through mobile payments.⁴

But despite the expansion of these digital offerings, the gender gap in financial inclusion has remained virtually unchanged over most of the past decade. Moreover, DFS are not a replacement for human interaction and physical infrastructure (Tsan et al., 2019).

Compared to men, women farmers in all regions of the world control less land and livestock, make far less use of improved seed varieties and purchased inputs such as fertilizers, are much less likely to use credit and insurance, have lower education levels, and are less likely to have access to extension services (Ghanem, 2011). Women smallholder farmers are a heterogeneous group; not only do they vary from place to place in terms of what, how much, and for what end they produce, they also have different roles within the household and along agricultural value chains. These differences have implications in terms of what their needs for financial services are – including the scale and timing of product and service requirements – as well as how these varied groups of women within rural and agricultural livelihoods are targeted.

In 2020, the Bill & Melinda Gates Foundation commissioned a report on DFS for women smallholder farmers, with a focus on those women farmers shifting to commercial or higher-value crops for the market – the target population of the foundation's agricultural development strategy. The report focuses on the following questions:

- What are the likely financial needs of women smallholder farmers transitioning to higher-value crops for the market economy?
- What barriers have women smallholder farmers faced in accessing and using DFS? What are ways to overcome these barriers?
- What specific gender-related constraints and opportunities do smallholders experience in accessing DFS?
- What are some good practices and innovations in strengthening DFS for women smallholder farmers?

Addressing these questions can inform two distinct but interrelated foundation portfolios that invest in financial services for low-income women: Digital Farmers Services within the Agricultural Development Team, and Financial Services for the Poor (FSP). The digital farmer services strategy – which encompasses digitally enabled agricultural advisory services, farm management decision support, input supply, market access and linkages, as well as financial services – focuses on the development of these technologies to accelerate inclusive agricultural transformation, where the latter is understood as transitioning out of purely subsistence production and into greater integration with agricultural product markets. FSP's women's economic empowerment strategy is concentrated on making digital financial systems work for women. Specifically, the team is identifying priority segments and pathways where DFS holds the most promise to accelerate women's economic participation and empowerment, including agriculture and related value chains.

4 GSMA, "[The Value of Pay-as-you-go Solar for Mobile Operators](#)," April 2020.

Box 1. What Are Digital Financial Products and Services?

According to the World Bank (2017b), the principal digital financial offerings are:

- 1. Credit scoring:** new and alternative credit scoring mechanisms (beyond credit bureaus) that allow farmers to develop credit profiles, including data from mobile prepaid sources such as airtime transactions, psychometric testing, and payment/e-commerce data (East Africa had the greatest prevalence of these products).
- 2. Loan disbursement and collection:** including digital channels that can deliver instant credit, and loan repayments that reduce time and transaction costs.
- 3. Savings:** this includes non-bank financial institutions offering interest-bearing savings accounts with mobile wallets, as well as conventional banks extending their reach to rural and other areas.
- 4. Insurance:** including mobile money service providers partnering with insurance companies to offer a range of products, as agricultural insurance lags behind other types of insurance (life was 51% of offerings, health 22%, and agriculture only 7% in the 150+ cases reviewed).
- 5. Payments:** including mobile money, cash transfers, bill payments, and card-based products. Digital payments for agricultural products have led to around 40 million adults in developing economies opening an account (Demirgüç-Kunt et al., 2018).
- 6. Market pricing:** including information on agricultural market prices provided digitally, based on geographic information.

WOMEN'S DIGITAL FINANCIAL INCLUSION: GAPS AND OPPORTUNITIES

Recently, digital tools and platforms have greatly improved access for women to a range of financial products and services, delivered primarily via mobile phones. [The Global Findex 2017](#) (the latest year for which data is available) shows that women are 7 percentage points less likely than men to have a bank account. These differences, however, are narrower in some economies with high mobile money ownership. In Kenya, for example, men are 18 percentage points more likely than women to have a traditional bank account – but more women than men have only a mobile money account. There is some evidence that mobile money services – which allow users to store and transfer funds through a mobile phone – can help improve women's income-earning potential. Research in Kenya found that access to mobile money services delivered significant benefits, especially for women. It enabled women-headed households to increase their savings by more than a fifth, allowed 185,000 women to leave farming and develop business or retail activities, and helped reduce extreme poverty by 22% among women-headed households ([Suri and Jack, 2016](#)).

Mobile phones have brought about a revolution in access to financial services in many developing countries, where traditional accounts often have been beyond the reach of poor women because of the high fees (relative to their limited incomes) and lack of formal documentation or literacy skills required. This has changed with the possibility of accessing financial services via a mobile phone. Access to mobile money accounts and other digital financial services like savings and credit is growing, especially in developing economies, and is reaching rural populations that otherwise have been excluded from formal systems.⁵ GSMA's latest report on mobile money shows 1.2 billion registered

accounts worldwide, operating in 96 countries. In sub-Saharan Africa alone, there were 548 million accounts by the end of 2020, more than 150 million of which were active on a monthly basis.⁶

It is also believed that digitized agricultural payments will increase rapidly in the coming years; there is growing recognition that expanding digital payments and building responsible digital payments ecosystems are fundamental to creating a more productive and sustainable agricultural sector. The benefits of digital payments will accrue to women farmers as well as men if designed to the needs of women – by enabling them to receive compensation, transparently and securely, for their crops, thus reducing leakages that often occur in cash payment systems, digital payments allow them to save money and reinvest it in their agricultural activities.⁷

This said, gender gaps in financial inclusion remained virtually unchanged from 2011 to 2017 (Demirgüç-Kunt et al., 2018); in developing economies, the gender gap has remained consistent at 9 percentage points. In addition, the gender gap in mobile phone ownership in LMICs has remained largely unchanged since 2017. At the end of 2020, according to GSMA Intelligence, 83% of women in LMICs owned a mobile phone, yet 17% or 374 million women were still unconnected to a mobile phone of their own. Across LMICs, growth in mobile ownership remains relatively flat overall. Women are now 7% less likely than men to own a mobile phone.⁸ While the extent to which digital financial inclusion constraints are present for women smallholder farmers varies by country, as well as by region, the evidence points to the key factors constraining women, described below.

5 Technology and Women's Empowerment (Routledge Studies in Gender and Economics), Chapter 2. Klugman et al., 2021.

6 GSMA State of the Industry Report on Mobile Money 2021.

7 FAO, [The Digitization of African Agriculture Report 2018-2019](#).

8 GSMA The Mobile Gender Gap Report 2021.

Demand-Side Factors

Gender-restrictive social norms shape what is acceptable in terms of behavior, choices and actions for men and women. In the rural context, these rules and codes of behavior – implicit or explicit – affect the economic, household, and community roles men and women take on, as well as their access to, control over, and ownership of resources. Gendered social norms can give rise to barriers to women's demand for both conventional and digital financial products and services. Examples include:

- Limiting women's **MOBILITY**, particularly rural women, which affects not only their ability to participate in conventional financial services, but also their ability to work at various levels of the agriculture value chain.
- Hindering women's **ABILITY TO INTERACT WITH FINANCIAL INSTITUTIONS** – e.g., the need for women to be accompanied by a man to the bank.
- Limiting the **ECONOMIC ACTIVITIES THAT ARE ACCEPTABLE** for women, as well as their financial independence. These constraints may be even more limiting in isolated rural contexts.
- Limiting women's **LAND SUCCESSION**, which has impeded access to conventional loans.

Gender norms vary greatly by sociocultural context; thus, a clear understanding of these mores and how they potentially can affect access to, and usage of, digital financial services is central to their success in reaching women, including women smallholder farmers (Arnold & Gammage, 2019; FAO, 2019; Gammage et al., 2017; Garz et al., 2020; Spencer et al., 2018; World Bank, 2017b). For example, Digital Green, which provides DFS to farmers in South Asia and Ethiopia, notes that in India, social norms vary by state and region, thereby affecting women's access to land and other assets, and their potential to access and use financial products (K. Pallassana, personal communication). In West Africa, according to Solidaridad's experience in DFS programming in the region, social norms similarly affect women farmers' ability to access land and move into market production (A. Benewaa, personal communication). Solidaridad's approach in this cultural context is to work with women household heads or women who have access to land and/or have their husband's support. In India, women's use of mobile phones challenges traditional gender norms; researchers from Harvard's Kennedy School found that normative barriers (social norms, customs, individual beliefs) were more negatively impactful than economic barriers (cost of handset, airtime) to women's mobile phone ownership, which was 33 percentage points less than men's in 2018.⁹

A Mercy Corps AgriFin gender assessment of digital financial services in Kenya and Zambia found that women's more limited access and ownership of resources (e.g., land title or adequate acreage) reduced their use of DFS and products, such as inputs, input credit, and learning opportunities (Mercy Corps AgriFin, 2021b). Adapting products to meet resource limitations helped overcome these challenges (ibid.).

Intrahousehold Bargaining Power

Linked to gender norms is intrahousehold bargaining power. In both rural and urban settings, socially constructed norms dictate women's and men's gender roles in the household and women's ability to bargain, make decisions, and make choices. A study of the provision of ATM cards in Kenya found that digital access increased the use of pre-existing formal bank accounts for accounts held jointly with, or by, men but had no effect on women accountholders (Schaner, 2017). Authors concluded that intrahousehold concerns had a large and meaningful effect in women's saving patterns (ibid.). Some forms of digital financial inclusion can have a positive mediating impact on power relations in the household. Field et al. (2019) tested the role of digital payments under a number of different modalities in terms of women's control over household resources under India's MGNREGS program. Through the use of a large-scale randomized control trial, the research found that using direct-payment schemes and carrying out basic training on the use of bank accounts increased women's bargaining power in the household and challenged prevailing norms about women's work outside the home (ibid.). Women's access to mobile cash transfers in Niger was also found to shift bargaining power in the household because these transfers were not as visible to other household members (Aker et al., 2016).

Given intrahousehold dynamics and gender power structures, men in the household cannot be overlooked; there is substantial literature pointing to the need for engaging men in programming that targets women and challenges gender norms, including in rural settings (Bannon & Correia, 2006; Chant & Gutmann, 2000; Kimmel, 2002). In terms of DFS examples, agents from Babban Gona needed to approach the male household members to discuss business opportunities for women in the household (K. Masha, personal communication). In Kenya and Zambia, Mercy Corps AgriFin found that women had limited agency on higher perceived-risk digital products, such as credit, and thus required the permission of spouses, which led to longer decision-making processes for these women (Mercy Corps

⁹ Harvard Kennedy School, Evidence for Policy Design: "[A Tough Call: Understanding barriers to and impacts of women's mobile phone adoption in India.](#)"

AgriFin, 2021b). A program in rural Uganda that combined digital sub-wallets to provide increased financial privacy with a series of joint husband-and-wife consultations had a strongly positive impact on women's confidence in their ability to utilize a mobile banking application in order to save for pre-specified investments and expenditures.

Time Poverty

Competing demands on women's time in terms of household and caregiving responsibilities means they have less time to engage in economic activities, which can affect their demand for financial services. In Zambia and Kenya, for example, Mercy Corps AgriFin found that women farmers face greater time poverty resulting from additional household and childcare duties, as well as constraints to mobility, thereby limiting their ability to use some services – e.g., learning, accessing inputs, and taking produce to the market (Mercy Corps AgriFin, 2021b).

Digital financial products and services have been found to significantly reduce transaction costs, as well as lead to time savings (Gammage et al., 2017), which could be particularly relevant for rural women, given their heavy work burdens. Other advantages of digitization included improved timeliness of payments and lower leakages. Aker et al. (2016) found that with a public transfer program, both women and men saved the equivalent of 2.5 days over five months.

Financial inclusion – digital or otherwise – can potentially increase women's ability to invest in labor-saving measures and efficiencies in unpaid work, and free up time for economic activities (Gammage et al., 2017), which again would be particularly relevant for rural women. Moreover, there is empirical evidence from social protection schemes and government programs of positive time savings from digital payments. In Niger, digital social protection payments resulted in reduced logistical challenges for recipients, including less time spent collecting their transfers and increases in women's intrahousehold bargaining power (Aker et al., 2016).

Risk, Privacy, and Trust Preferences

RISK. Gender differences in individual preferences can influence the demand for, and use of, financial products and services – digital or otherwise (Gammage et al., 2017). A large body of research points to gender differences in the way men and women are affected by shocks and crises (Quisumbing et al., 2016), perceive risks, and respond to these calamities, with women generally more risk-averse than men (Msangi, 2017). In Bangladesh, for example, both risk perceptions and aversion, as well as trust in institutions,

were found to explain gender differences in the uptake of weather index insurance, suggesting that government-backed insurance may result in greater acceptance among women (Akter et al., 2016).

Similarly, a randomized field experiment and analysis in Senegal and Burkina Faso compared men and women farm managers' preferences for financial products. The study found that women farm managers were less likely to purchase agricultural insurance and more likely to invest in savings for emergencies, even when researchers controlled for access to informal insurance and differences in crop choice (Delavallade et al., 2015). The fact that women face additional lifecycle risks related to health and childcare was considered to be the main reason for this gender gap. Thus, savings instruments might be more effective for women clients, or a combination of insurance and savings products (Msangi, 2017). The Delavallade et al. (2015) study noted that farmers who purchased more insurance generated higher yields and thus were able to better manage shocks and reduce food insecurity, which suggests the benefits of also promoting insurance products that work for women smallholders.

PRIVACY. Preferences in terms of privacy vary by gender. A number of DFS studies suggest that women seek products and services that offer greater privacy in transactions (ibid.). As noted above, digital accounts may increase privacy around finances, which is considered a benefit of DFS (Garz et al., 2020). According to Riley (2019), providing microloans through mobile money resulted in higher business capital and profits in Uganda as a result of increased privacy and control over finances (Garz et al., 2020).

TRUST. Associated with the issue of risk-aversion is trust. With the expansion of new technologies and financial products, trust has appeared as a key barrier to overcome, particularly for women and even more so for rural women. According to GSMA, women customers tend to take more time to trust mobile money services than men, need to make twice the number of transactions before they are comfortable with digital services, and rely more on agents for support than men (Scharwatt & Minischetti, 2014). The higher bar in terms of trust in technology and the banking system has also been observed by organizations such as Global Banking Alliance for Women and Women's World Banking (Spencer et al., 2018). Mercy Corps AgriFin similarly found trust to be a key variable for women in the uptake of DFS in Kenya and Tanzania, noting the importance of using on-the-ground local and well-known agents, familiar and trusted brands, and personalized digital messaging that increased trust and willingness to engage (Mercy Corps AgriFin, 2021b). This is not surprising, given that relative to men, women have fewer resources and assets and are

thus more vulnerable. Trust is particularly relevant to digital applications; given lack of complete information, an individual must take a “leap of faith” when adopting a new technology (Bahmanziari et al., 2003).

A 2018 USAID-funded study on the role of trust in increasing women’s access to finance through digital technologies identifies five properties in successful adoption of technology, which would be applicable to rural as well as urban women: (1) women must be assured that issues that arise are addressed simply and quickly, (2) the product provider should have legitimacy in the eyes of women, (3) a trustworthy organization or advocate must be available to act as a bridge between the women and the product provider, (4) technical support should be available to train women on the use of the technology, and (5) there should be peer acceptance of the technology (Spencer et al., 2018).

Financial and Digital Literacy

Smallholder farmers are characterized by relatively low levels of formal education, with women having less education than men. Rural women’s lower literacy and levels of education translate into financial illiteracy, which in turn reduces their access to financial services. Both men and women face financial literacy constraints but women more so than men: Across the developing world, 69% of men and 75% of women are financially illiterate. And according to a review of Financial Inclusion Insights data sets, literacy and numeracy are the key determinants of women’s use of DFS (World Bank, 2017b). Experience with DFS programming from the field emphasizes the challenges related not only to low literacy levels of rural women but lack of exposure, which limits “mindsets” and attitudes to apply new approaches and accept new practices, according

Box 2. Digitizing Rural Women’s Savings Groups in Tanzania

Informal savings groups provide a context within which to introduce digital financial inclusion tools to women farmers. Recent research in Tanzania (Arnold, 2020) suggests that digitizing savings groups – introducing the use of mobile technology to provide support, access to formal accounts, or information to members – holds promise for time savings, financial goal-setting, on-time loan repayment, and digital literacy.

For eight months between July 2019 and February 2020, DreamSave provided smartphones, a monthly data plan, and a digital ledger application to 13 savings groups comprised of 10–25 members each, 70% of whom were women, in the Mara region of rural Tanzania. Using a pre-post study design, the key findings from the pilot program were:

- By automating calculations for loan repayments, fines, and savings balances, DreamSave reduced time spent on financial transactions from 2.5–3 hours to 30–60 minutes.
- Group cohesion, a critical element to savings groups, remained the same for existing groups and did not prevent new groups from forming bonds.
- DreamSave goal-setting significantly improved members’ ability to know how much they need to save to reach their goal. Women in new groups and existing groups reported a 50% and 70% increase, respectively, in knowing how much they needed to save for a specific goal.
- SMS reminders increased in group loan repayment discipline. DreamSave app data revealed that 25% of “paper-to-digital” groups’ and 50% of “born digital” groups’ loans were repaid before the due date.
- The introduction of a group smartphone increased members’ curiosity about using this technology for other purposes. Members from both existing and new groups reported spending time outside of their savings groups learning how to navigate both the phone and the app, thus increasing digital literacy and capability.
- The shift away from paper ledgers – familiar and easily verifiable – to an app on a smartphone created uncertainty for some women. This is due to the fact that very few of them had ever interacted with a smartphone prior to the pilot, as well as the fact that this shift to digital changed the perception of who had access to and ownership of the group ledger.

to Solidaridad in West Africa (A. Benewaa, personal communication). Digital literacy is necessary for the uptake and use of financial services and products (USAID, 2020). In Tanzania, a DreamSave pilot concluded that digital literacy training was required for women to adopt technology; women-only training through community “digital champions” was found to be the most effective (Arnold, 2020) (see Box 2). Likewise, research from Ghana found that women smallholders needed training on how to use technology to access agricultural and market information (Owusu et al., 2018). In Kenya and Zambia, Mercy Corps AgriFin found that while digital literacy was not a barrier to women farmers’ adopting DFS using simple channels, it was a constraint to engaging them on more complex platform components (Mercy Corps AgriFin, 2021b). In Indonesia, digital literacy was found to be more important than education for financial inclusion (Moorena et al., 2020).

Access to Technology

Despite significant progress in expanding mobile services, a significant gender gap exists in access to technology, with the gap likely wider in rural areas. In LMICs, mobile access is 7% lower for women than men, translating into 143 million fewer women mobile owners than men. Smartphone ownership is 20% lower for women in low- and middle-income countries (GSMA, 2021). There are some promising data regarding women accessing the internet via mobile phones: The gender gap in mobile internet use is decreasing, with women in low- and middle-income countries 15%

less likely to use it than men, as of 2020. This reduction has been driven primarily by South Asia, where it decreased significantly from 50% in 2019 to 36% in 2020. The gender gap in mobile internet use in South Asia is now on par with sub-Saharan Africa, where the gender gap remains largely unchanged. Still, across LMICs, there are 234 million fewer women than men accessing the mobile internet.¹⁰

A study of financial services in Southeast Asia found that most products and services are generally not developed with women in mind (time constraints, access, and knowledge), and women are less likely to own the needed technology (ADB, 2017). In some sub-Saharan African countries,¹¹ the majority of mobile money clients are men, with women less likely to own phones, use the internet, or be informed about DFS options (Chamboko et al., 2018). In Kenya and Zambia, Mercy Corps AgriFin found that women farmers were less likely to own smartphones and more likely to own feature phones, which have limited storage capacity; this in turn affects knowledge refresh and learning opportunities (Mercy Corps AgriFin 2021b). Most DFS offered fail to explicitly target women or consider this digital gender gap (World Bank, 2017b). The digital gender gap, analyzed for a set of six sub-Saharan African countries,¹² is driven by lower levels of education and economic status, as well as increased work demands in the household (Alozie and Akpan-Obong, 2017). This technology barrier translates into more limited opportunities for women to take advantage of new DFS offerings as compared to men.

Supply-Side Factors

Discriminatory legal frameworks, norms, and practices have been documented as a key constraint to women’s financial inclusion and economic participation. According to the World Bank’s “Women, Business and the Law” series, which studies the laws and regulations that restrict women’s economic inclusion, on average women have just three-quarters of the legal rights afforded to men.¹³

In addition to the legal and regulatory constraints faced by women, much research has focused on the asset gap in rural areas, as well as women’s limited property rights to serve as collateral (Gammage et al., 2017; World Bank, 2017b).

While there is less documented evidence of other supply-side barriers, they include:

- Imperfect information on credit worthiness and borrower riskiness, which affects pricing (interest rates) and the amount of lending offered and results in credit rationing (Gammage et al., 2017). While problems of asymmetrical information affect both women and men smallholders, lending practices that expand formal credit to marginal borrowers appears to have a greater positive effect on women than men, reducing their likelihood to pursue informal sources (ibid.).

¹⁰ [GSMA The Mobile Gender Gap Report 2021](#).

¹¹ DRC, Ghana, Kenya, Senegal, Tanzania, Uganda, Zambia.

¹² Ghana, Kenya, Nigeria, Senegal, South Africa, and Uganda.

¹³ [Women, Business and the Law 2021](#).

- Identification requirements that limit access to finance for many smallholders but particularly women. Identification can support access to financial services by increasing visibility on farmer collateral and creditworthiness, improve supply chain traceability by linking farmers to assets, and demonstrate individual ownership of assets.¹⁴ Almost half of women in developing countries do not have formal, foundational identification, compared to one-third of men, which means women more often face barriers to participating in formal payment schemes and access to basic services (Kofman and Payne, 2020).
- Limited access to market information for pricing (World Bank, 2017 b).

In terms of digital platforms, a number of studies from sub-Saharan Africa on the uptake of mobile money point to the importance of: (1) strengthening the quality and density

of agent networks, (2) fostering interoperability across mobile money service platforms, and (3) adapting policy and regulatory frameworks to enable interest-bearing accounts (Gammage et al., 2017). GSMA findings from Côte d'Ivoire also indicate that gender gaps in mobile money are most prominent at the account pre-registration stage, thus suggesting that supply-side practices have gender consequences (Minischetti, 2017).

The social transfer literature further provides relevant insights on the influence of supply-side interventions on gender and DFS (Gammage et al., 2017). Digital transfers that are specifically targeted to women clients, provide complementary training to women and men, and allow for liquidity have been found to be central to women's digital financial inclusion (Field et al., 2019; Gammage et al., 2017).

Box 3. Strengthening Supply-Side Factors for Improving DFS to Women Farmers

A 2021 Mercy Corps AgriFin study on digitally enabled agri-businesses examined the operations of DigiFarm in Kenya and AgriPay/ZANACO in Zambia to identify models for gender inclusion. The study makes the case for investing in women farmers as an untapped customer segment on the basis of their critical roles in the agriculture value chain and contributions to agricultural labor. The study found, however, that women clients require after-sales support, and that women's social groups play an important role in reaching this client segment. The study proposes the following gender-inclusive strategies for improving supply-side factors related to the provision of DFS:

Product Design

- Design products and services to suit women's needs and lifestyles – e.g., flexible loan terms
- Prioritize products that women are more likely to adopt – e.g., savings over credit
- Identify and bundle the right product mix based on women's preferences

Go-to-Market Strategies

- Select strategically aligned partners during product design, development, and deployment
- Leverage women's groups to deepen DFS touch points in rural areas and formalize social networks as part of the onboarding channels
- Provide after-sales support to drive active use

Enabling Environment

- Engage gatekeepers (husbands and the broader community) to reduce barriers to onboarding
- Ensure last-mile access points are friendly to women
- Invest resources to build women's DFS literacy and confidence

Business Intelligence

- Collect gender-disaggregated data
- Conduct scoping research to gather gender-specific insights – e.g., drivers of behavior, priority value chains for women
- Conduct ongoing data analytics to inform adaptive product management

Source: Mercy Corps AgriFin (2021a)

14 [The Role of Digital Identification in Agriculture: Emerging Applications](#). The World Bank ID4D, 2018.

Institutional barriers to smallholder farmers' access to DFS were examined by the World Bank (2017a), which concluded that all levels of financial service providers needed to address gender-discriminatory and gender-blind practices and policies. Lack of gender-specific policies and practices for product design and marketing and inappropriate distribution channels were found to be barriers to financial inclusion of women smallholder farmers in the World Bank's global review of 150 DSF applications (World Bank, 2017b). The study revealed that DFS providers had not yet made substantive efforts to conduct market research and adapt products, services, and marketing strategies

to meet the needs of women farmers, especially in rural areas (ibid.). More recent research carried out by Mercy Corps AgriFin on its partners' DFS operations in Zambia and Kenya highlight barriers and opportunities for investing in women farmers and set out strategies for improving supply-side interventions (see Box 3). Lastly, legal and societal restrictions on women's ability to inherit property and their ability to engage in economic activity have a direct impact on their ability to start and grow their commercial agribusinesses.¹⁵

Unintended Consequences

For all its promise in advancing women's economic empowerment, financial inclusion may in some circumstances lead to unexpected negative impacts. Increased intimate partner violence (IPV) is one such unintended consequence that has been documented in the context of microfinance and cash transfer programs. As Gammage et al. (2017) note, however, the direction of the relationship between women's increased incomes and IPV from these programs is complex. A 2019 study examined the connection between women's financial inclusion and recent IPV using nationally representative data from 112 countries globally (McDougal et al., 2019). Overall, the global multivariate analysis showed that women's financial inclusion was associated with lower levels of recent IPV after accounting for women's economic autonomy and gender norms. But context matters: The relationship did not hold in fragile countries and countries with lower human development indicators (ibid.). Also, in those low- and middle-income countries with high levels of controlling behavior by male spouses, financial inclusion was associated with higher levels of recent IPV. Research has found that agricultural development projects that do not consider men risk increasing IPV for women (Malapit et al., 2020).

Increasing women's time burden is another unintentional outcome that is likely to affect rural women to a greater degree, given their heavy workload. If financial inclusion increases time spent on income-generating agricultural activities without a concomitant reduction in household chores, women's time poverty increases (Gammage et al., 2017). Lack of consideration of women's household and caregiving responsibilities has been a common issue over the decades since the emergence of women's economic development programs.

15 IFPRI, "[Gender equality in rural Africa: From commitments to outcomes](#)," 2019, Chapter 5, "Beyond Access: Gender-Transformative Financial Inclusion in Agriculture and Entrepreneurship."

UNDERSTANDING WOMEN SMALLHOLDER FARMERS' DIGITAL FINANCIAL NEEDS

Categories for understanding different types of women smallholder farmers

While no one segmentation can fully describe a market, there are several categorizations of smallholder farmers that can be useful in determining which digital financial tools are most useful to whom, and how to best serve them. CGAP's [Focus Note "Smallholder Households: Distinct Segments, Different Needs" from 2019](#) is a good starting point to help understand household livelihood profiles and strategies, even though CGAP's analysis does not consider gender. CGAP began exploring the diversity of smallholder households in 2013, collecting extensive data through national surveys in Mozambique, Uganda, Tanzania, Côte d'Ivoire, Nigeria, and Bangladesh, and then used these data to segment for financial inclusion among smallholder households in each country. It is worth noting that across the six countries, none of the variables that most strongly influenced financial inclusion of smallholder households were related to agriculture.¹⁶ The resulting segments did have very distinct agricultural livelihood profiles and levels of financial inclusion, but their agricultural characteristics were not the most influential drivers of their financial inclusion.¹⁷

Researchers from Mercy Corps' AgriFin used a behavioral change framework that incorporated four financial health indicators adapted from the [Center for Financial Services Innovation Beyond Financial Inclusion: Financial Health as a Global Framework](#). The indicators measure a woman's ability to 1) build and maintain reserves, 2) plan and prioritize finances, 3) access a range of financial tools, and 4) manage existing debt.¹⁸ In Zambia, women smallholders

fell into one of four distinct personas, based on these indicators: An "entrepreneur" is a woman who scores highly on all four indicators; a "restrained hustler" shares traits with the "entrepreneur" in terms of money planning and debt management but has a more difficult time accruing savings and has limited access to financial tools; a "tried and true" has financial plans and priorities but struggles with savings and consistency in her ability to pursue new interests, and a "burdened breadwinner" scores low on all the financial health indicators and is focused primarily on daily survival. [See Appendix A for a full description of these personas.]

Based on research among women farmers in Kenya, a similar segmentation developed by The Human Account is based on a three-dimensional framework of demographics, financial behavior, and psychological traits.¹⁹ The four segments described in The Human Account smallholder farmer research are similar to the profiles used by AgriFin: "Educated Planners" are mostly young, married women with secondary school education; "Careful Strivers" are highly active financial managers across channels; "Cautious Independents" are mostly lower-to-middle-income rural married women with high income volatility relying on farming and social support; and "Disciplined Pragmatists" are the poorest segment with the highest income volatility. [See Appendix A for a full description of these personas.]

16 Indicators of agricultural activities included crop and livestock sales, amount of agricultural land, and a smallholder livelihood profile, which includes perception of their ag activities as a business, types of labor used, etc.

17 Each segmentation exercise identified six variables as the key drivers of financial inclusion among smallholder households – including educational attainment, access to emergency funds, attitude toward the future, socioeconomic status, occurrence of an unexpected event, and mobile phone ownership.

18 Mercy Corps, AgriFin: "[For Women Smallholders in Zambia, Financial Inclusion is Not 'One-Size-Fits-All'](#)" Nov 2018.

19 [The Human Account](#), Kenya Women Farmers.

DFS design considerations for segments

For the less-savvy, less-financially healthy smallholder farmers described above, many of whom do not participate in savings groups, there are basic design considerations that can help them take advantage of the benefits of DFS for them and their businesses. Because they are less likely to save or borrow money (except from family members) for their business, getting them more comfortable with basic DFS like mobile money and mobile savings would be a desirable first step. Mobile usage can be deepened through simple, clear use cases for saving or sending money, supported by agents. Small business growth can be encouraged by savings-loan products that are clear and easy to use, with low minimums and high flexibility to smooth income. Savings products that can celebrate short-term goals, reinforcing good behavior, can help pave the way to longer-term savings goals. Building trust in these services is important as well; positive, simple messaging that reinforces that these services can work well for women farmers is critical.²⁰

For women smallholders who are more comfortable saving for the long term and growing their businesses by borrowing (Educated Planners and Careful Strivers, representing 59% of Kenya's women farmers, or roughly 8.5 million women), providers should consider offering goal-based savings products to help protect their savings for longer-term needs, such as healthcare and education. Also, bundling savings and credit features can offer these groups good ways to access capital to grow their businesses. Lastly, given that many of these women are savvy mobile users,

providers should consider offering tailored services (such as mobile insurance) that can help them build on their use of financial service offerings. Mercy Corps/AgriFin found that digital agricultural platforms have positively impacted the livelihoods of women farmers. The safe storage of money and ability to track expenses on the platform result in better financial planning and budgeting. Women have increased yields on their farms due to knowledge gained from platforms teaching better agricultural practices, and as a result now access high-quality and certified inputs (as observed on DigiFarm, Arifu, and FtMA). On AgriPay, women farmers also report having higher financial discipline after using AgriPay, due to reduction in spontaneous spending compared to when they store money at home. Digital agricultural platforms have also had a positive impact on women farmers' empowerment. On DigiFarm, FtMA, and Arifu, women farmers increased their decision-making agency on the farm and in the household. On all platforms, women farmers cited that their spouses have trusted them more with decisions upon seeing the knowledge they have garnered from the platforms or increased yields and incomes after using the platforms. Women farmers on Arifu, DigiFarm, and FtMA also reported feeling greater control over, and confidence in, their own learning journeys, due to being able to access learning content at any time and to decide how and when to learn.

20 [The Human Account](#), Kenya Women Farmers.

STRENGTHENING DFS FOR WOMEN FARMERS: LESSONS FROM PROGRAMMING

The review of good practices in DFS revealed few programs that target women or women smallholders specifically, consistent with the findings of the World Bank (2017b) extensive global analysis. This said, the review resulted in the identification of a number of vital elements that can be incorporated into existing programs and services or can be applied in the design of new ones aimed at supporting the financial inclusion of women farmers.

- **BIOMETRIC IDENTITY CARDS.** India's government-led biometric identity cards program (Aadhaar), which was established in 2009, has helped expand the use of DFS through support (and regulation) of technological infrastructure and systems for both women and men (Pazarbasioglu et al., 2020). Due to the Indian government's strong drive to increase account ownership through the adoption of identify cards, the gender gap in account ownership narrowed from 20 to 6 percentage points from 2014 to 2017 (Demirgüç-Kunt et al., 2018).
- **GOVERNMENT TO PERSON (G2P) CASH TRANSFER PROGRAMS** have been effective in increasing financial inclusion if they consider semi-literate and semi-numerate populations as part of any digital solution (Arnold and Gammage, 2019). In Mexico, Brazil, and Iran, gender gaps in money account ownership decreased as a result of G2P programs. In Ghana, between 2014 and 2017, mobile money account ownership increased by 200% due in part to a shift in digital G2P and G2G payments and infrastructure investments (Pazarbasioglu et al., 2020). Design considerations for effective digital cash transfers for low-income women have been built into the "Digitize, Direct, Design (D3)" framework, described in the World Bank's "[Digital Cash Transfers in Times of COVID-19, Opportunities and Considerations for Women's Economic Empowerment](#)" report (Zimmerman et al, 2020).
- **BUSINESS-TO-PERSON (B2P) PAYMENTS** offer the potential to ensure timely efficient payments to women farmers. For example, startups such as Stellapps in India, which was established in 2011 to contribute to the digitization of the dairy supply chain, is exploring ways to use B2P payments to women through a pilot program for women dairy farmers.²¹ Stellapps is also endeavoring to bring improved technology to millions of women milk producers in remote rural areas of India.
- **ALTERNATIVE CREDIT SCORING.** Psychometric credit scoring was tested with women entrepreneurs in Ethiopia and was found to provide useful predictions of default in the absence of other data (Alibhai et al., 2019). Tala, a smartphone application that is using alternative credit scoring to provide loans between \$10 and \$200, has been downloaded to over 1.5 million smartphones in Kenya. Tala does require a smartphone and works on a 30-day loan cycle, however; thus, adjustments would need to be made to be effective for agricultural purposes and for women clients (World Bank, 2017b).
- **FLEXIBLE LOAN OPTIONS.** VisionFund Tanzania is one of a number of programs piloting applications that use information collected about a farmer's crops, plot size, planting and harvesting schedule, and family life to structure a personalized payment plan consistent with the agricultural season (World Bank, 2017b). While not specifically targeted to women, it could be adapted to reach women through a comprehensive marketing campaign (ibid.) Easypaisa, a branchless banking service in Pakistan, offers flexible deposits to account for seasonal farm cycles (ibid.). Easypaisa works with the Benazir Income Support Programme and the Cash for Work programme in collaboration with Care International to target women clients. M-Pesa in Kenya, which has not explicitly targeted women, established a portfolio of 58.3 million mobile wallets from when it was established in 2007 to 2019, in part due to regulatory flexibility that fostered innovation and simplified products without onerous documentation requirements (Pazarbasioglu et al., 2020) and flexible repayment periods (1-6 months) (World Bank, 2017b).

21 <https://www.stellapps.com/wp-content/uploads/2020/07/Sep-2019.pdf>

Box 4. Musoni Microfinance: Using Mobile Money to Reach Women

Musoni Microfinance, the first microfinance institution in the world designated as a 100% mobile cashless operator, was established in 2009 in Kenya with the aim of reaching the unbanked. Musoni provides group, individual business, agribusiness, education, and emergency loans for clients in urban, semi-urban, and increasingly rural areas. Musoni is able to reach remote areas by using a cash flow software, developed with the help of Grameen Foundation and Feed the Future Partnering, and by placing loan agents in every village where it works. These agents visit farmers in person and are able to wirelessly submit farmers' loan applications and track customer information, including repayment information and changes in income. If a loan is approved, funds can be deposited into the customer's mobile money account within 72 hours.

Musoni has been popular with women clients in Kenya's community savings groups. Loans are guaranteed by the group, which selects members based on creditworthiness. This approach overcomes a key credit access barrier for low-income women, who often lack the documents or assets for collateral needed for traditional bank loans. Plus, applying for a loan with Musoni is a relatively simple process, which is particularly important for women who are new to formal banking services. Once a group expresses interest, a loan officer visits to explain the service and loan terms and conditions, and over a four-week period that follows, individuals must save 20% of the value of the loan they have requested through M-Pesa. Once the savings target is met, the loan is disbursed and repaid via M-Pesa.

Source: <https://www.gsma.com/mobilefordevelopment/country/kenya/musoni-using-mobile-money-to-strengthen-microfinance-services-for-women/> and www.musoni.co.ke

- **INTEROPERABLE PAYMENT SYSTEMS.** In Tanzania, four providers of mobile money (M-Pesa, Airtel, Tigo Pesa, and EzyPesa) compete while sharing an agent network with interoperable payment services (Pazarbasioglu et al., 2020). This collaborative system has led to lower service costs and increased access and uptake (ibid.), which would be relevant for both men and women farmers and which would be an important element to consider in designing the building blocks of DFS and products for women farmers.

Despite the lack of targeted programs for women smallholders overall, the European Women Payments Network (EWPEN) 2020 report on women's focused DFS describes a new global trend targeting women clients, including in payments and credit, financial management, insurance, investment, and funding sources (Fintech News, 2020). In the context of developing countries, the report cites the example of Musoni Microfinance in Kenya, which in its offerings includes group lending, individual loans, and agricultural loans. According to Musoni, over 68% of the agri-business loans have been to women smallholder farmers (see Box 4).²²

Bundled services

Agriculture financing is challenging, in part due to the cyclical and unpredictable nature of farm income. Moreover, smallholders require a range of services to increase farm productivity at different points in the value chain, including technical advice, production inputs, market access, and credit. Financial institutions often bundle savings, lending, and insurance instruments to meet the needs of their clients, as well as offer complementary nonfinancial services. For women in particular, complementary support is often critical to address financial and digital illiteracy, as well as constricting social norms (Fletschner and Kenney, 2014, Barr et al., 2020). Some examples of bundled services, though not necessarily designed to target women, are described below and in Box 5:

- **ONE ACRE FUND** bundles credit for seed and fertilizer, conducts training on farm techniques and improving crop management, offers post-harvest and market support (e.g., crop storage solutions and training on market fluctuations to maximize profit), and provides crop insurance, on the premise that providing services together will significantly increase incomes and improve well-being.²³ In Kenya, One Acre has enabled farmers to make digital loan repayments using M-Pesa, which has facilitated the financial inclusion of the poorest farming communities and benefitted women clients in particular (FAO 2019).

²² See <https://musoni.co.ke>

²³ <https://oneacrefund.org/what-we-do/our-model/>

- **FARMDRIVE**, based in Kenya, bundles credit and insurance for small farmers. It collects expense and revenue data from farmers via SMS and combines it with satellite imaging, remote sensing technology, and alternative data points (e.g., soil analysis, weather forecasts) to create detailed yield estimates and assess credit risk.²⁴ This information allows FarmDrive to partner with financial institutions to develop credit profiles and make lending decisions (World Bank, 2017b). Loans are bundled with insurance and disbursed and repaid through the M-Pesa platform (ibid.). According to the World Bank (2017b), the basic nature of the platform and accessibility through messaging services has increased DFS access for women smallholders.
- **AGRI-WALLET** in Kenya, which is World Bank- and FCDO-supported, is a digital wallet for farmers, which involves financial service providers, value chain partners, and farmers. When farmers earn revenue through sales, they can choose to be paid in money through M-Pesa or in tokens in their digital wallets earmarked for purchasing input supplies for the next cropping season from vetted merchants²⁵. Because credit takes the form of tokens rather than currency, lenders are more willing to provide farmers with loans. Agri-wallet also helps farmers to save and in turn enables them to access short-term loans through Rabobank: Currently 35% of the farmers who use the wallet also save.²⁶
- **LOOP, AN APPLICATION FROM DIGITAL GREEN**, which has been using video-based agricultural extension for years, works in India and Bangladesh to increase access to markets and market information. Loop uses community members as “aggregators,” who on behalf of farmers identify the best prices, arrange transport based on volume, and sell produce directly to wholesale buyers. Aggregators use Loop’s mobile application to record collections, sales, transport type, costs, and trader details in a digital ledger, which automatically sends receipts to farmers via text message. After completing transactions on behalf of each farmer, farmers receive same-day payment and aggregators earn a commission.²⁷ Loop has led to farmers, including women, reducing time spent traveling to markets and negotiating better prices, with payments made digitally.
- **BABBAN GONA**, in Nigeria, provides credit, seeds, fertilizers, extension advice, transportation, and storage to cereal-producing smallholders, with a view to helping them commercialize. The program, which has worked with 110,000 farmers over 10 years, uses a psychometric test to evaluate production skills, personality, job potential, and abilities in place of collateral – and it does not require literacy.²⁸ While the program did not initially focus on women, activities have been expanded to support women businesses close to their homes; around 35% of farmers served are now women (K. Masha, personal communication).

A criticism of bundled financial services is that farmers may receive information overload leading to confusion, may not fully understand the secondary product they are offered, or may feel pressure to purchase. CGAP research conducted in Colombia however, showed that the take-up of insurance offerings was 23%, consistent with experiences in other countries, although insurance amounts were small, with price for insurance being a major deciding factor (Zimmerman et al., 2016).

²⁴ <https://farmdrive.co.ke>

²⁵ <https://www.cta.int/en/digitalisation/article/agri-wallet-a-wallet-for-smallholder-farmers-sid00f60f624-f62a-4b58-bd27-bd2c838b724f>

²⁶ For a review of Agri-wallet’s service delivery model, see <https://www.idhsustainabletrade.com/uploaded/2020/03/SDM-Case-Report-Agri-wallet-Kenya.pdf>

²⁷ <https://www.digitalgreen.org/wp-content/uploads/2017/06/Digital-Green-Loop-brief-June2017.pdf>

²⁸ <https://babbangona.com/>

Box 5. Pula Bundled Services for Smallholder Farmers

Launched in 2015 as a Kenya-based startup, Pula is an agriculture and insurance technology company that designs and delivers insurance and digital products to help smallholder farmers address climate risks, improve their farming practices, and increase incomes. Pula works with governments, seed/fertilizer companies, loan providers, and other agriculture value chain partners to bundle insurance with farm input products or loan credit, as well as with local insurance companies and global reinsurance firms to underwrite risk.

The three types of class index insurance are: (1) Yield Index Insurance, which covers all risks that affect yield, including locusts, fall armyworm, floods, hurricanes, and drought; (2) Weather Index Insurance, which is short in duration and covers germination failures due to, for example, drought or delayed rains; and (3) Index Based Livestock Insurance, which covers pastoralists when grazing rangelands are insufficient (e.g., due to drought or delayed rains). Pula's other products and services include:

- **Mobile Phone-Based Referral, Marketing/Customer Acquisition**, which is an SMS-based referral marketing program that uses small incentives to encourage farmers to invite friends to purchase the seed/fertilizer brand of the program's partners.
- **Digital Agronomy**, which involves farmer education delivered via SMS, USSD, and WhatsApp, and advises farmers on adopting best-practice farming techniques based on their location, crop type, and agronomic conditions. Pula also uses this channel to send early-warning alerts on extreme weather conditions and pests and diseases so farmers can respond early.
- **Business Intelligence Dashboards and Market Insights**, which are real-time dashboards that allow Pula's partners to track sales to the last mile and identify sales performance per product line.
- **Supply Chain Tracking/Optimization**, which are data tools to help companies, governments, and off-takers monitor activities in the field remotely. Through analytics dashboards, everything from pest outbreaks to input purchases and yield levels at a district level can be tracked.

In 2020, Pula partnered with Shell Foundation and the UK government to explore the effects of gender on farmer agricultural decisions in East and Southern Africa. Currently, women comprise 41%, 29%, and 20% of Pula-registered farmers in Kenya, Zambia, and Malawi, respectively. Key recommendations from the inquiry included increasing awareness of women farmers on the value of insurance through campaigns and targeting; educating women farmers on inputs and practices; and bundling products according to preferences of women farmers.

Source: <https://www.pula-advisors.com>, <https://shellfoundation.org/learning/how-gender-impact-agricultural-insurance-decision-making-in-emerging-markets/> and <https://techcrunch.com/2021/01/25/kenyan-insurtech-startup-pula-raises-6m-series-a-led-by-tlcom-capital/>

DFS through village savings and loan associations (VSLAs)

Digital finance programs are looking to VSLAs, including savings, credit and cooperatives organizations (SACCOs), and rotational savings and credit associations (ROSCAs) to reach women farmers (see Box 5). Banking on Change, a partnership between CARE, Plan, and Barclays, leverages VSLAs in Tanzania to build the group savings model, with the expectation that the addition of savings and individual accounts could benefit women (World Bank, 2017b). CARE USA's Pathways program, which has supported women's agricultural productivity and empowerment in five countries (India, Ghana, Malawi, Mali, and Tanzania), found that VSLAs offered an important entry point for reaching women (Brown et al., 2016). In Kenya and Tanzania, Mercy Corps AgriFin found farmer and savings groups to be an effective channel through which to recruit women farmers to their partners' digital financial platforms, because women predominate in these groups and related peer behavior increases women's trust and drives registration (Mercy Corps AgriFin, 2021b). CARE Uganda's Digital Sub-Wallets for Increased Financial Empowerment of Women Project found that the mixed-gender composition in VSLAs did not provide women the

same level of solidarity and support to build financial independence from their spouses – although privacy-enhancing tools and household-level financial counseling significantly increased women's confidence in their ability to save for specific goals (CARE, 2017, see Box 6). Mercy Corps had similar results with mixed-gender settings; women's time constraints to attend meetings and limited agency to sell produce negatively affected their confidence to borrow (Mercy Corps AgriFin, 2020).

Providing DFS through VSLAs can work without being technologically advanced. MaTontine, for example, uses simple feature phones in West Africa to provide and facilitate loans, insurance, group purchases, and lending using the existing group (MaTontine) structure. Similarly, in Chad, a group savings product (Tigo Paaré) enables members to save using a simple and transparent process (Kabir and Klugman, 2019). In Uganda, a Mobile Banking and Information Software (MOBIS), developed by Ensibuuko, enables SACCOs to save and withdraw money and receive loans on their phones with the assistance of mobile money agents; it has so far been very well-received in Uganda, with potential for expansion (CTA, 2018).

Box 6. VSLA and DFS in West Africa – A Game Changer

VSLAs have been a “massive breakthrough” in terms of establishing relationships with financial intermediaries, according to Solidaridad in West Africa. In fact, the VSLA structure is now a requirement for clients of many financial institutions. As of January 2020, VSLAs numbered 20,000 members, of which 62% were women and youth (further gender disaggregation unavailable). The VSLAs have thus far generated USD 200,000 in savings and leveraged USD 1 million in loans from financial institutions. According to Solidaridad, the VSLA is a specific legal entity that was created to mobilize savings, establish credit scoring, and attract financing. As such, VSLAs must comply with these legal and governance formal requirements, which establish clear rules of the game and prevent conflict within groups.

VSLAs vary in composition and include mixed male-female farmer-only groups (some of which are organized around supply chains), women-only VSLAs (in cocoa, in palm oil, and in artisanal mining), and youth-only groups. Mixed groups have not been a constraint for women; Solidaridad reports that more women than men participate in these groups.

Key lessons from Solidaridad's experiences include: (1) VSLAs are the central vehicle for working with financial institutions (for farmers, VSLAs ensure that farmers stay liquid throughout the year); (2) digital is the future for supporting entrepreneurship; (3) life skills training is essential to deal with low literacy levels and limiting “mindsets” in rural areas; (4) simple financial instruments co-designed with the farmers work best; (5) bundled services are needed to address the financial constraints, as well as the various social and technological constraints (e.g., mobile phones); (6) investing in women's entrepreneurship pays off – there is much value in targeting women because women have historically had few opportunities compared to men; and (7) in terms of targeting, those women who are heads of household, who own their own land, or who have some income-generating activity have the most potential for scale-up.

Source: Akua Benewaa (personal communication)

DIGITAL PLATFORMS

As described earlier, digital platforms are a promising avenue for smallholder farmers to take advantage of the network effects of having multiple users onboard. Platforms tend to thrive in fragmented industries where they are able to aggregate disconnected players and remove expensive gatekeepers, an especially important consideration in reaching women smallholder farmers. One trend to watch is the expansion of existing sector-agnostic platforms, such as mobile money services, into smallholder markets. Payment platforms are most often integrated into both pipeline and platform businesses, with users rarely aware they are engaging with two different organizations. For example, M-Pesa is used for financial transactions made through the DigiFarm Platform, which is run by Safaricom in Kenya. Both BigHaat (India) and Agrofy (several Latin American countries) use third-party digital finance solutions to facilitate transactions made on their platforms.²⁹ Payment platforms are commonly used by farmers to purchase inputs, make payments on rental equipment or loans, and receive payment for produce.

Platforms can be well-suited to address some of the barriers women smallholder farmers face in markets and digital financial services access. DigiFarm is a good example of a platform that has studied the needs of women farmers to better tailor their services and increase their outreach to women. In 2019, they partnered with a women's cooperative, whose agents helped women farmers sign up for and use the platform. For many women who signed up and used the platform, especially those who did have access to markets, DigiFarm made it possible to add a new income stream to their livelihood. DigiFarm's women customers reported a boost in their household decision-making power, self-esteem, and confidence. Relative to men, women reported that they were attracted by certain aspects of DigiFarm's value proposition, including non-cash form of inputs on credit and access to higher-quality inputs. Additionally, women were more likely than men to sell produce through DigiFarm vs. other channels. Women also placed more value on the presence of field agents to support them in product registration and delivery of advisory services. While targeted acquisition efforts may require more upfront investment by digital platforms, DigiFarm demonstrates the potential of women to become attractive customer segments.³⁰

29 [Agricultural Platforms in a Digital Era: Defining the Landscape](#). March 2021. See also Mercy Corps AgriFin "[DigiFarm Gender Impact Study: Final Consolidated Report](#)," April 2021.

30 Ibid.

TAKING A GENDER-TRANSFORMATIVE APPROACH TO FINANCIAL INCLUSION

There is also a school of thought that by innovating with the above-mentioned approaches, which essentially adapt existing systems and products to women's needs, low-income rural women will continue to face barriers unless the underlying gender inequalities embedded in the system are dealt with, including social norms and roles, as well as the gender division of labor. Gender-transformative approaches to financial inclusion would involve challenging unequal power relations within legal and regulatory frameworks and adverse social norms, for example.

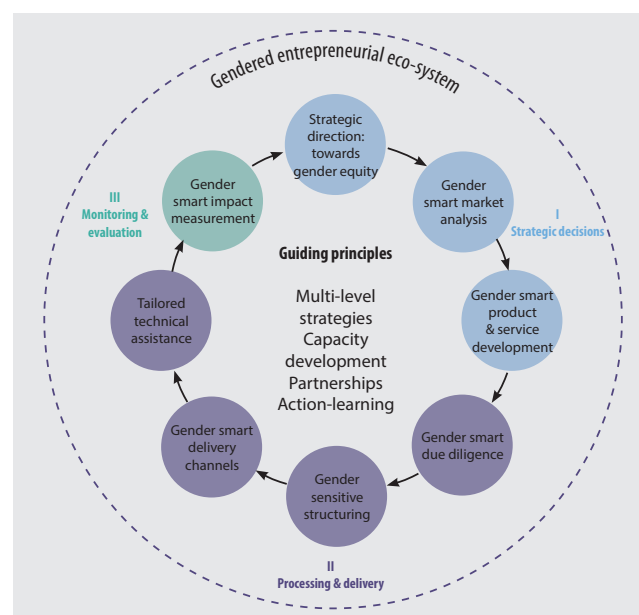
A gender-transformative approach would entail new and more "gender-smart" ways of doing market research, choosing strategic direction, designing products, and delivering services so that gender-equal financial systems are created with the intention that all entrepreneurs, regardless of gender, can overcome demand and supply-side constraints and pursue their livelihood strategies on equal footing.³¹

When a gender-transformative approach is applied, the strategic direction gets reframed and redirected toward gender-equality achievements and meaningful impacts on the lives of women. It means analyzing how gender works at home between spouses, in markets, and in cultural and regulatory systems that shape the lives of men and women, and the power relations between them. Product design and service delivery would also reflect gender analysis, integrating gender-smart design features that include the use of women-centered design approaches, such as the use of group formation or combining financial products with nonfinancial services – leadership training for women, for instance.³² One example of a gender-transformative approach to financial inclusion is CARE's Digital Sub-Wallets program in Uganda, described in Box 7, which consisted of combining a mobile banking service for women with digital sub-wallet folders, along with household counselling sessions aimed at equalizing the influence of women and men in family money management and decision-making.

While both treatments increased women's confidence in their ability to save, the impact was significantly greater for those women who also participated in the household counseling sessions.

Vossenberget al. (2018) describe a gender-transformative approach in the financial inclusion lifecycle to show how transformative gender-smart approaches can be embedded at all points in the process of an entrepreneurial ecosystem. [See Figure 1.] The authors acknowledge that more research is needed on the ways financial institutions can enable women to overcome systemic constraints. As they write, "Gender-transformative financial inclusion is about making financial systems 'women-able,' rather than making women 'bank-able.'"

Figure 1. Gender-transformative approach in the financial inclusion life-cycle



31 IFPRI, "Gender equality in rural Africa: From commitments to outcomes," 2019, Chapter 5, "Beyond Access: Gender-Transformative Financial Inclusion in Agriculture and Entrepreneurship."

32 Vossenberget al., 2018.

Box 7. Digital Sub-Wallets and Household Dialogues in Rural Uganda

CARE Uganda implemented an innovative intervention with an explicit women's empowerment component among 1,400 members of village and savings loans associations in rural southwestern Uganda (Scott 2020). The pilot program consisted of combining a mobile banking service for women with digital sub-wallet folders, along with household counselling sessions aimed at equalizing the influence of women and men in family money management. The objective of the sub-wallets was to provide privacy and autonomy, while the counselling sessions – which emphasized transparency, sharing, and collaboration – were aimed at addressing intrahousehold barriers to women's financial empowerment, a gender-transformative approach to financial inclusion. Women also received training in the technical use of mobile phones and basic financial management, including goal-setting and saving.

The program was implemented as a three-arm randomized control trial to distinguish the impacts of the digital sub-wallets from the household dialogues. The main findings were:

- Women and men in both treatment arms opened and utilized their mobile bank accounts, with a significant rise in the number of transactions during the second year of the program. Because most women used their funds to pay school fees, there was no significant accumulation of savings during the study period.
- Seventy-five percent of women who signed up for the mobile account used the sub-wallets; this was equally true for participants and non-participants in the household dialogue treatment.
- Both treatments increased women's satisfaction and confidence in their ability to save; the impact was significantly larger for those women who had also participated in the family counseling sessions.
- Married women's mental and emotional well-being was also significantly enhanced by participation in the household financial treatment, as was men's partner behavior regarding household budgets, shared financial knowledge, and respect for women's financial needs.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Key messages and recommendations

Many predict that the use of DFS by smallholder farmers, whether through platforms or as direct services, will only increase in the coming three to five years due to the power of data and evolving business models and advent of new technologies. It is expected, however, that hybrid “digital + human” business models will remain critical to the growth of the use of DFS by both men and women smallholder farmers, because of the importance of last-mile agents needed to support market linkages and logistics.³³ It’s important to ensure that women can easily access and use DFS, so they aren’t left further behind in this development.

A number of key messages emerge from this evidence review:

- 1.** DFS solutions should focus less on women SHF’s farming characteristics and more on their financial health when helping them take advantage of DFS for their businesses. This said, credit scoring, loan disbursement and collection, savings, insurance, payments, market pricing, linkages, and agricultural extension are all relevant needs across all segments of women producers, with loan disbursement and collection, market pricing, and agricultural extension more relevant for women smallholder farmers expanding into markets.
- 2.** The gender gap in DFS has not narrowed over the past decade. Despite a global increase in access to financial products and services via mobile platforms, and opportunities for greater gender inclusion through the digital space, both supply- and demand-based constraints persist.
- 3.** Gender differences in risk and privacy concerns, as well as trust in financial systems and ease of use, are among the issues influencing digital financial inclusion. Women are also less able to access required technology. In addition, financial institutions continue to be gender-blind or to practice discriminatory practices – inadvertently or otherwise – despite decades of investments in the sector and increased awareness of the importance of gender considerations.
- 4.** At the heart of the many gender issues that women face in accessing financial tools are the social norms that dictate behavior, choices, and preferences, and that affect intrahousehold dynamics. Supply-related constraints are also affected by gender mores and norms. Social norms also vary considerably by geography: What is possible in West Africa may not be possible in India; and within India, what is possible in the state of Kerala may not be feasible in a state such as Bihar. DFS aimed at reaching women smallholders must address this critical dimension early in the design stage.
- 5.** Digital platforms and services have the potential to address some of the gender-specific financial inclusion barriers faced by women smallholders, including access, bargaining power, privacy, opportunity cost of time, timeliness of financial transfers, safety, and mobility. Key barriers related to DFS, however, include technology access and control, as well as trust in the DFS systems. What is clear is that no one product or service is a panacea. A range of financial and related needs must be addressed.

33 [Agricultural Platforms in a Digital Era: Defining the Landscape](#). March 2021, p. 126.

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- 6.** Technical solutions alone will not solve the underlying social and cultural barriers that lie at the heart of financial exclusion. While numerous technological innovations from both the private and public sectors have emerged in the past decade to address the chronic and intractable constraints faced by poor farmer households, complementary activities that consider social and cultural norms, financial and digital illiteracy, and intra-household dynamics and time use must accompany these solutions.

Based on these findings, we make five broad recommendations.

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- 1. Invest in bundled and gender-customized products and services that meet the financial needs and characteristics of women smallholder farmers transitioning to market production and contribute to their empowerment and financial inclusion.**

For the less financially healthy, getting them more comfortable with basic digital financial services like mobile money and mobile savings supported by agents is a good first step. Women farmers can be encouraged by savings-loan products that are clear and easy to use, with low minimums and high flexibility to smooth income. Building trust in mobile money and mobile savings through positive, simple messaging reinforces the belief that these services work for women farmers and paves the way toward more advanced usage. Bundled DFS with a range of offerings is more likely to be effective, given the multi-dimensional constraints that women smallholder farmers face, and the cyclical and unpredictable nature of agricultural income. Products and services also need to be customer-centric so they are appealing and respond to the financial goals of women farmers – for example, flexible loan terms, costs related to the account, tailored income/repayment/savings plans, and schedules to allow for income smoothing. The composition of products included in the bundle will vary across geographies and regions, and will be affected by cultural and social barriers, but it is likely to include agricultural extension, market information, and insurance coupled with the soft skills in financial and digital literacy. How services are delivered also matters, including adjusting the physical accessibility of services. In terms of meeting the DFS needs of the foundation's interest group for this report, integrated value chain approaches can offer comprehensive solutions, support the commercialization of women's products, and increase inclusion and empowerment of women smallholder farmers.

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- 2. Leverage the strong role played by rural VSLAs (and create these if they do not exist) to strengthen the financial inclusion of women smallholder farmers transitioning to market production.**

VSLAs (ROSCAs, SACCOs, self-help groups, and the like) are trusted and have been effective in extending financial services to rural women as compared to conventional microcredit offerings. Mobile wallets that link to bank accounts has been shown to increase group investment and savings in pilots in Africa. When beneficial and sought by group members, the digital migration of the group account can also provide a pathway to individual account ownership by group members. NGOs that have more direct experience working with women can act as facilitators and intermediaries between DFS providers and women's groups. They can also help negotiate fees and terms and provide needed training and capacity-building to women's savings groups during the transition. Finally, these NGOs can provide a key role in increasing trust in DFS.

-
- 3. Ensure that digital financial products and services are designed with a gender and intrahousehold perspective, including activities targeting men of the household.**

Women smallholder farmers will need a certain level of autonomy and agency to take advantage of, and make decisions on, financial products. Understanding intrahousehold dynamics and social norms is central to meeting this objective, identifying the most effective mechanisms to work with women, and avoiding unintended backlash and negative outcomes. Planning at the household level is also critical to the success of financial programs as they relate to production and time use and facilitate digital financial services' delivery and uptake. Measures may include supporting household-level agreements on financial goals in terms of savings and income, as well as gender awareness training at the household level and targeting the men of the household. In both the Digital Sub-Wallets project and CARE's [LINK Up project](#) (which provided financial products targeted to women's savings group members), a focus on women's financial autonomy and intrahousehold relationships was found to be critical to the adoption of new digital technologies.

4. Leverage existing successful DFS providers so that they better target women smallholder farmers.

The existing digital finance ecosystem has the potential to address many of the constraints women smallholder farmers face in accessing and using credit, insurance, and other digital financial products. The World Bank's (2017b) desk review revealed that many DFS providers offer mobile savings, insurance, and credit products, but they do not target women, and marketing and promotional efforts do not recognize women as a separate consumer segment. As a result, services are also not designed to take into account women's unique circumstances and needs – for example, loan terms that account for seasonality, and service access points that are culturally sensitive. Selecting providers that are gender sensitive or demonstrate a strong interest in re-orienting their focus toward gender equality in their solutions can help create solutions that are not limited to a single product and have a higher likelihood of systemic effect on both the market and the providers themselves.³⁴ Building the capacity of DFS providers to extend their services to women smallholders could involve reviewing existing service delivery models to see how gender can be integrated into different stages of service provision and ensuring that that these providers include gender performance indicators and collect sex-disaggregated data (IDH 2020). DFS providers could also partner with organizations that have the skills and experience to reach women smallholder farmers, which in turn could help these providers build robust systems to better reach women customers (ibid.).

5. Contribute to research that builds empirical evidence of what works to increase access and use of DFS among women smallholder farmers.

More research is needed to increase our understanding of both the constraints and the opportunities for DFS to reach and support women smallholders that seek to be more integrated into commercial agricultural markets. This review was limited by the lack of evidence on the determinants of financial inclusion – and digital financial inclusion in particular – for women smallholder farmers. For example, how do the specific needs and financial health of women smallholders vary by type of farmer or *persona* (female household head, partnered women farmer as contributor, collaborator, main proprietor, women farm laborer, women-owned agribusiness) and by type of financial service? And how do their barriers and opportunities also vary? How do different types of DFS affect women's ability to participate in agriculture and livestock value chains? The literature suggests the need for research on gendered social norms as they affect access and use of finance, the impact of DFS on time use and intrahousehold dynamics, and the effects of introducing DFS and products on VSLAs and social cohesion. More research is also needed on how ways of approaching financial inclusion could enable women to better overcome constraints and improve their livelihoods on equal terms to men.

34 World Bank (2021), [Women in Agriculture using Digital Financial Services: Lessons Learned from Technical Assistance Support to DigiFarm, Fenix, and myAgro.](#)

APPENDIX A.

WOMEN SMALLHOLDER FARMER SEGMENTATIONS

Mercy Corps, AgriFin, “For Women Smallholders in Zambia, Financial Inclusion is Not ‘One-Size-Fits-All’”

1. An “**ENTREPRENEUR**” is the woman who scores highly on all four indicators. She is financially savvy, well-respected, considered a leader in the community, and likes to give financial advice to others. She is likely to have multiple income-generating activities in her life and be engaged in different value chains. She may be in more than one savings association targeted to different priorities (e.g., school, farm inputs, investing in assets). Her financial needs are geared toward financial growth, and she needs financing options to grow her business and diversify into new ones.
2. The second persona is the “**RESTRAINED HUSTLER**.” She shares traits with the “entrepreneur” in terms of money planning and debt management but has a more difficult time accruing savings and has limited access to financial tools. The “restrained hustler” needs quick access to asset financing and support in managing household savings to meet her longer-term goals. She may take financial risks if she believes there will be a return.
3. The third persona is the “**TRIED AND TRUE**.” She has financial plans and priorities but struggles with savings and consistency in her ability to pursue new interests. She tries multiple avenues for income generation and is not able to stick with any one very successfully.
4. The fourth persona is the “**BURDENED BREADWINNER**,” who scores low on all the financial health indicators and is focused primarily on daily survival. She is overwhelmed with emergency expenses at home and lacks financial backup, although she may aspire to pay for her children’s education or set up a small shop. She is somewhat risk-averse, distrusting of banks, and afraid to access formal credit for fear of not being able to repay.

The Human Account, Kenya Women Farmers

1. **EDUCATED PLANNERS** (3.9 million, 27% of Kenyan women farmers). Educated Planners are mostly young, married women with secondary school education. Farming is an important source of income for them, as are self-owned businesses and formal work. Educated Planners have strong financial health. They have a higher and more stable income than average, and their high conscientiousness and low impulsivity mean that the vast majority have a plan to manage their expenses.
2. **CAREFUL STRIVERS** (4.6 million, 32% of Kenyan women farmers). Careful Strivers are highly active financial managers across channels. They primarily manage their money through informal groups and friends, family, and mobile wallets. Across all three channels, they have the leading rates of saving and borrowing among women farmers in Kenya.
3. **CAUTIOUS INDEPENDENTS** (2.7 million, 24% of Kenyan women farmers). Cautious Independents are mostly lower-to-middle-income rural married women with high income volatility relying on farming and social support. Driven by their circumstances, Cautious Independents are less financially healthy than women farmers and Kenyans on average. Due to their low and volatile income, they face frequent struggles with expenses and emergencies, as well as planning and saving to build financial cushions. Their economic struggles likely constrain their ability to focus on long-term financial plans and goals.
4. **DISCIPLINED PRAGMATISTS** (2 million, 17% of Kenyan women farmers). Mostly low-income young, rural, married women with primary school education, Disciplined Pragmatists are the poorest segment with the highest income volatility. As a slightly younger segment, they are more likely to share household financial decisions with their spouse or someone else in their household. While all farm, under one-fifth primarily rely on farming, also relying on casual labor, self-employment, and income support. Disciplined Pragmatists are most likely to receive support from family members or other women farmers.

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