WORKING PAPER

STRENGTHENING RURAL WOMEN'S CLIMATE RESILIENCE

Opportunities for Financial and Agricultural Service Providers

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EXECUTIVE SUMMARY

Rural women play critical roles in global food systems, working as farm managers and paid and unpaid laborers in all aspects of agricultural production, processing, and distribution and a range of other non-farm activities in rural economies (Doss, Njuki, and Mika 2020; Montalvao and Van de Velde 2020; Njuki 2020). Ensuring global food security requires that rural women are equipped with the tools and resources they need to adapt and thrive in the face of a changing climate.

But the realities facing rural women affect their ability to adapt and build resilience to climate change. Due to limiting gendered social norms,[1] women typically have unequal access to knowledge, tools, assets, and financial capital. As a result, they have lower average productivity than men and less ability to adapt to the new climate reality. These norms also limit their opportunities to diversify into new economic activities or migrate to cope with the effects of climate change (Katz 2020).

Rural women need a range of tailored, climate-smart agricultural solutions[2] to not only adapt, but thrive in the face of climate change and help build more resilient food systems. Equipped with the right tools, rural women can drive increases in food production, ensure household nutrition, and contribute to mitigation efforts.

However, few services and solutions respond specifically to women's needs and ambitions. Only about 7 percent of resources for agricultural extension target women and 14 percent of donor resources target smallholder women farmers (Mercy Corps AgriFin 2018). Among registered users of digital agtech solutions in Africa only 25 percent are women (Tsan et al. 2019).

New technologies have the potential to deliver climate-smart financial and non-financial solutions to rural women at scale. By combining digital data, digital financial services, mobile channels, and platform approaches with in-person support and expertise, innovative business models are making it easier for providers to reach women at the last-mile, while addressing their mobility, time, and privacy concerns.

CGAP and Mercy Corps AgriFin collaborated on this working paper in order to identify sustainable and scalable opportunities for providers, donors, and investors to better serve rural women by supporting their adaptation and long-term resilience to climate change.

The paper provides an overview of **10 opportunities for service providers, investors, and donors to improve rural women's resilience to climate change, and gives examples of innovative ways in which financial and agricultural service providers are already seizing these opportunities.**

[1]Informal rules and norms that exist in societies, or "social norms," influence the access, usage, and benefits of financial services. Gendered social norms are a subset of social norms and are defined as the collectively held expectations and perceived rules for how individuals should behave based on their gender identity (Burjorjee, El-Zoghbi, and Meyers 2017). Gender norms prevent women and men from being fully financially included and while women's financial inclusion is always intended as a means to an end—women's economic empowerment—the realization of these outcomes is often hindered by gender norms (Koning, Ledgerwood, and Singh 2021).

[2]Climate-smart technologies, services, and approaches are designed to contribute to productivity and livelihoods; build resilience to the shocks and stresses of climate change occurring now and foreseen in the future; and, where feasible, curb greenhouse gas emissions (Rainforest Alliance 2021).

The 10 opportunities and examples are based on CGAP and Mercy Corps AgriFin's experience working with service providers to build rural women's resilience and livelihoods, as well as a review of the literature and evidence on climate resilience, agriculture, and gender. The goal of this paper is to help guide providers as they seek out opportunities like these and others to more effectively serve rural women, while also deepening donors and investors' understanding of promising approaches to addressing climate change and women's economic empowerment.

SECTION 1

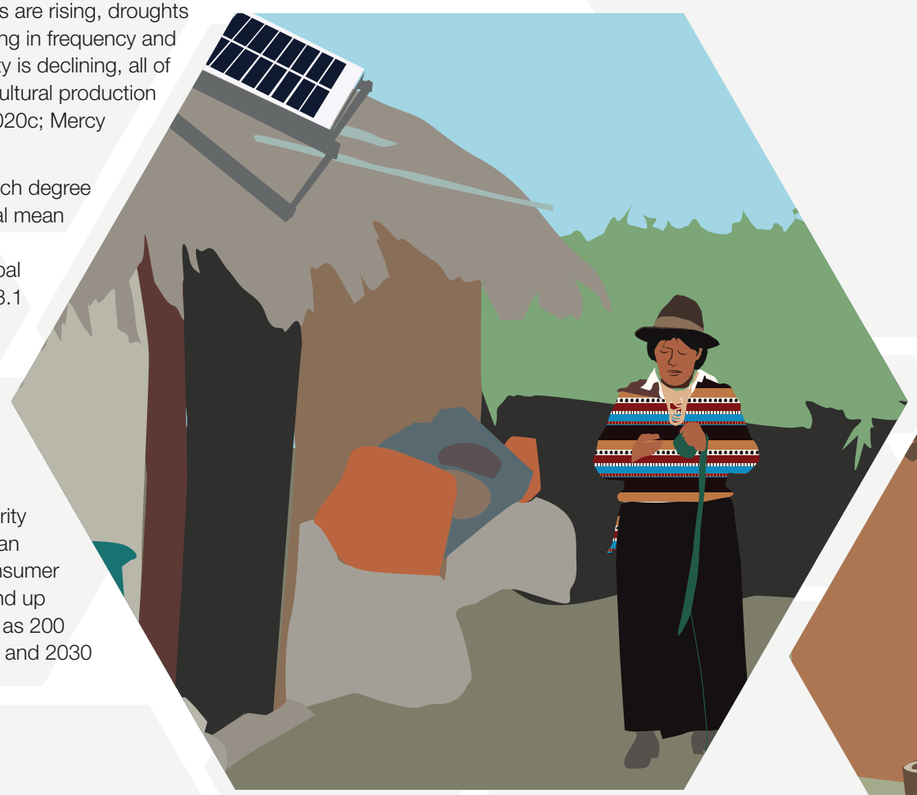
INTRODUCTION

Smallholder agriculture–and global food security–are increasingly under threat from a changing climate

The livelihoods of 40 percent of the world's population — 2 to 3 billion people — depend on small-scale agriculture (Woodhill, Hasnain, and Griffith 2020). Over 500 million smallholder farmers grow food on less than 2 hectares (Lowder et al. 2021), generating over one-third of the global food supply (Ricciardi et al. 2018).

But smallholders are under increasing stress due to climate change. Rainfall and weather patterns are changing, temperatures are rising, droughts and floods are increasing in frequency and intensity, and soil quality is declining, all of which undermine agricultural production (Chikava 2021; FAO 2020c; Mercy Corps AgriFin 2020b).

Without adaptation, each degree of increase in the global mean temperature could, on average, decrease global yields of soybeans by 3.1 percent, rice by 3.2 percent, wheat by 6.0 percent, and maize by 7.4 percent (Zhao et al. 2017). And when agricultural production decreases, consumer prices and food insecurity increase. In sub-Saharan Africa, the average consumer price of maize could end up increasing by as much as 200 percent between 2010 and 2030 (FAO 2020c).



Rural women are critical to ensuring global food security, and disproportionately vulnerable to climate change

Rural women are disproportionately exposed to climate change and also central to adapting to and mitigating its impacts on agricultural production and food security (FAO 2020b; Gannon et al. 2022; Goh 2012). Women play critical roles in food production and security, particularly in rural areas. They raise crops and livestock, buy and sell food in markets, and prepare meals at home. Rural women work as farm managers and paid and unpaid laborers, engaged in all aspects of agricultural production, processing, and distribution, as well as a range of other non-farm activities in rural economies (Doss, Njuki, and Mika 2020; Montalvao and Van de Velde 2020; Njuki 2020). Indeed, agriculture is the primary activity of 79 percent of economically-active women in low-income countries (Quisumbing et al. 2014).

In addition, women manage their household's food security and nutrition, combining home gardens and market purchases to prepare meals, diversify diets, and educate children about healthy diets (FAO 2020b). And women are increasingly likely to be the head of their household (Van de Walle 2015). In rural Africa nearly one in four households are headed by women (Montalvao and Van de Velde 2020).

Effective strategies and services to strengthen agricultural production, food security, and rural economies must therefore center rural women. But climate change increasingly threatens women's key role in ensuring global food security. Due to gendered social norms, women typically have unequal access to knowledge, tools, assets, and financial capital. As a result, they have lower average productivity than men and less ability to adapt to the new climate reality (Sellers 2016). Gendered barriers to migration and non-agricultural employment also restrict women's adaptation options, and gendered divisions of labor in agriculture influence the crops and livestock that men and women raise and their farming activities (Davidson, Koyama, and Habershon 2022b; Katz 2020).

The shocks and stresses of climate change can also increase women's workload. When men migrate in search of new economic opportunities to adapt to the effects of climate change, women are left with more responsibilities and demands on their time (Djoudi and Brockhaus 2011). The need to diversify crops and livestock and the more unpredictable rainfalls that can force farmers to replant lead to increased workloads that fall disproportionately on women (Awiti 2022). When fuel and water are scarce, women spend more time and energy searching for them (Rao et al. 2017). Together, these factors can negatively affect the food security and health of households (Awiti 2022).

It is critical that efforts to build resilience to climate change focus on rural women. Not only are they disproportionately exposed to climate change, but rural women are also central to adapting to and mitigating its impacts on agricultural production and food security (FAO 2020b; Gannon 2022; Goh 2012).

Rural women are a diverse group facing similar trends

RURAL WOMEN ARE A DIVERSE GROUP, VARYING BY:

- **Lifecycle stage**. Women generally experience five distinct moments in life: finishing school, getting married, becoming a mother, entering work, and becoming a matriarch (IDEO.org 2021). Each has its own distinct needs and aspirations.
- **Household dynamics**. Women's household size and domestic relationships can influence their level of autonomy and dependency.
- **Livelihood**. Rural women engage in a range of paid and unpaid work, in agriculture and other sectors, earning income through managing farms and enterprises and providing wage labor.
- **Social context**. Varied social, cultural, religious, and geographic contexts shape rural women's attitudes, behaviors, and opportunities.

WITHIN THEIR DIVERSITY, COMMON TRENDS INFLUENCE RURAL WOMEN'S LIVES AND LIVELIHOODS

- **Agriculture** is the primary activity of 79 percent of economically-active women in low-income countries (Quisumbing et al. 2014). Investing in women can provide quicker, higher returns in agricultural growth (FAO 2020b), which is 2-4 times more effective than growth originating in other sectors at directly reducing poverty (Banerjee et al. 2014).
- **Gendered social norms** allocate rural women a disproportionate share of unpaid household labor and may restrict interactions with men, limiting their access to information and opportunities. Mobility constraints can also impede their ability to work, go to school, and build social networks (Koyama et al. 2021).
- **Household expenses** such as child-related and living expenses are prioritized by women, who tend to allocate increases in their own income or well-being to their family (Quisumbing et al. 2019). Households in which women influence economic decisions dedicate more income to food, health, education and children's nutrition (Banerjee et al. 2014).
- **Climate change** impacts women differently than men. Gendered barriers to migration and non-agricultural employment restrict women's adaptation options, and gendered divisions of labor in agriculture influence the crops and livestock that men and women raise and their farming activities (Davidson, Koyama, and Habershon 2022; Katz 2020).

To help service providers and funders achieve a deeper understanding of rural women's needs, CGAP has created personas that provide a nuanced segmentation of rural women's main profiles, experiences, behaviors, and goals. See this CGAP deck for more.

Financial and agricultural service providers can seize opportunities to strengthen rural women's adaptation and resilience to climate change

Rural women need a range of tools and services to adapt to a changing climate, fully engage in economies, and increase food security (van Nieuwkoop et al. 2022). But women remain a vastly underserved market for financial service providers, agribusinesses, and other companies active in rural economies. Gendered social norms that dictate women's roles in society and restrict their control overresources and decision-making not only limit women's access to financial and agricultural services but can also disincentivize businesses from targeting them as customers and suppliers. Indeed, many businesses do not tailor their marketing and service design to the needs of rural women and their varied motivations, behaviors, and aspirations, as they are often not viewed as economically active and can seem difficult to serve owing to their lower levels of asset ownership and education.

Increasingly, new technologies and approaches tailored to the unique needs of rural women are overcoming barriers to providing them with climate-smart solutions at scale. By combining digital data, digital payments, mobile channels, and platform approaches with in-person support and expertise, innovative business models are making it easier for providers to reach women at the last-mile, while also addressing women's mobility, time, and privacy concerns (van Nieuwkoop et al. 2022).

This paper provides an overview of 10 opportunities to strengthen rural women's resilience to climate change based on CGAP and Mercy Corps AgriFin's experience working with service providers, as well as a review of the literature and evidence on climate resilience, agriculture, and gender. It also presents examples of financial and agricultural service providers that are leveraging innovative approaches to seize these opportunities. The goal is to identify sustainable and scalable ways for providers, donors, and investors to better serve rural women by supporting their adaptation and long-term resilience to climate change.

1. **Digital tools and channels**: Digital financial services and agtech solutions increasingly offer rural women ways to access critical, climate-smart services. But in order for women to benefit from digital services, they first need access to digital tools and channels. New approaches such as device financing, agent networks tailored to women's needs, and innovations in increasing digital financial literacy can help rural women access and use digital services.

2. **Information and advisory services**: Shifting weather patterns have increased the importance of climate-smart agricultural practices[3] and made rural women's access to training, as well as weather and price information, more important than ever. Recognizing that rural women often struggle to access these services, providers are testing new models that leverage digital channels and have trusted local community members deliver timely and relevant advisory and information services.

3. **Inputs**: High-quality, climate-smart inputs are critical to cope with the increasing frequency of droughts and pest infestations driven by climate change. Yet rural women are less likely to access and use inputs such as improved seeds and fertilizers. New financial services business models, coupled with innovative crop research and distribution approaches, promise to expand rural women's access to, and use of, these climate-resilient inputs.

4. **Savings**: Savings can allow rural women to better prepare for climate shocks, avoiding their need to sell assets or take emergency loans when disaster strikes. Savings can also promote investments in adaptation, especially given women's propensity to save and hesitance to borrow. But the informal savings mechanisms women typically rely on can be ill-adapted to covariant shocks like droughts or floods. Innovative savings products can help rural women obtain the benefits of formal savings, while also enjoying the flexibility and familiarity of informal mechanisms.

5. **Credit**: Formal borrowing offers rural women an important means for investing in climate adaptation, especially given the high upfront cost required to transition to climate-smart agriculture. But rural women often lack access to formal sources of credit due to restrictive gender norms and lack of collateral. They must rely instead on informal mechanisms that often cannot provide adequate capital for their investment needs. Novel approaches to agricultural financing that leverage digital tools and data can break down barriers to financing rural women.

6. **Insurance**: Products like crop, yield, and weather index insurance can protect women's investments in climate-smart agriculture, making women more likely to invest in climate adaptation. Yet despite women's greater propensity to use insurance products, their features are often ill-adapted to women's needs and preferences. Some innovative insurance providers are adopting new approaches, such as flexible premium payments and bundling with other services that can make insurance more accessible to rural women.

7. **Labor-saving assets**: Women already face unpaid burdens on their time, including childcare, cooking, and collecting water and firewood. As climate change exacerbates these demands, rural women must find new ways to more productively and efficiently use their scarce time and energy. Innovations in asset financing can allow women to obtain assets that help them improve productivity and reduce efforts on unpaid household labor.

8. **Post-harvest storage**: Women are often responsible for post-harvest activities, including storing crops for sale and consumption. However, rural women's post-harvest storage methods are often insufficient or inadequate to protect against losses due to pests and moisture—threats exacerbated by climate change. In response, providers are experimenting with improved post-harvest services and logistics, including affordable packing materials and cold chain storage and transportation.

9. **Transport and logistics**: Transportation infrastructure and first- and last-mile logistics are both vital to rural livelihoods and essential aspects of rural supply chains. In addition to the limited availability, quality, and affordability of rural transport, rural women also face social constraints on their mobility. This restricts their access to markets and limits the viability and diversity of their livelihoods. It also increases women's exposure to harmful climate shocks and reduces their ability to adapt their lives and livelihoods to changing surroundings. Providing tailored transport and logistics services that specifically address women's constraints can help improve their resilience to climate change.

10. **Markets**: Because of their time, mobility, and social constraints, women are less likely to access brokers and traders, who are typically men. Women also have lower access to the price and market information that would allow them to negotiate and shop around for the best buyer. Rural women, therefore, tend to be less responsive to price volatility, which is important as climate events and weather shocks increase market volatility. New models such as digital marketplace platforms are increasingly connecting women with a greater range of buyers, facilitating their diversification into more climate-resilient crops.

[3]Climate-smart agriculture is an integrated approach to managing cropland, livestock, forests and fisheries that address the interlinked challenges of food security and climate change (WBG 2018).

1. DIGITAL TOOLS AND CHANNELS

Solutions designed to improve rural women's access to digital services

Digital financial services and agtech solutions increasingly offer rural women ways to access critical, climate-smart services.[4] Before rural women can access digital services, they need the right tools and support.

Rural women tend to have lower levels of literacy and numeracy and earn less income than rural men, making mobile phones, airtime, and data less accessible and affordable. These factors, along with cultural norms that limit women's privacy and mobility, also constrain their ability to use fully digital services.

Increasing women's ownership and control of mobile phones, especially smart phones, generates economic dividends (Roessler et al. 2021). And as the climate changes and livelihoods must adapt, access to digital tools will be even more important for rural women as the first step in accessing and generating returns from climate-smart information and services.

At the same time, women need in-person support when trying digital services for the first time. Agents, particularly female agents, play an important complementary role in helping rural women start using digital services and then answering questions and solving problems. Trusted community members, such as women leaders and members of women's groups, can also play a key role in helping guide women in the use of digital tools.

Female mobile money customers often feel more comfortable with female agents (DFS Lab and FSD Kenya 2020; GSMA 2020 and 2022b).

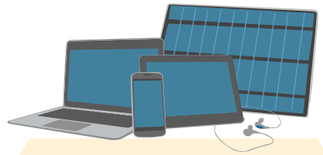
Compared to men, women in low- and middle-income countries are 7 percent less likely to own a mobile phone, 16 percent less likely to use mobile internet, and 18 percent less likely to own a smartphone (GSMA 2022a).

In Bangladesh, female agents were considered easier to approach, better at maintaining confidentiality, and more trustworthy and professional than male agents (Barooah et al. 2018).

In Tanzania, smart phone ownership improved annual household consumption per capita by 20 percent. Households in which women controlled the smart phone though spouses also used it showed the strongest consumption gains (Roessler et al. 2021).

In DRC, women making agent banking transactions are 7 percentage points more likely to transact with female agents than male agents. Women are also more likely to conduct larger transactions with female agents and smaller transactions with male agents (Reitzug 2020).

[4]Climate-smart technologies, services, and approaches are designed to contribute to productivity and livelihoods; build resilience to the shocks and stresses of climate change occurring now and foreseen in the future; and, where feasible, curb greenhouse gas emissions (Rainforest Alliance 2021).



KEIPhone

KEIPhone in Uganda provides **free smartphones and battery chargers to women using an advertising-based revenue model**. KEIPhone conducts user surveys to evaluate knowledge retention and captures detailed client data for tailored advertising. KEIPhone then displays customized content in local languages via video or banner ads, offers users data rewards for active engagement, and delivers video ads from sponsors. It also shows short videos of successful women farmers with guidance on increasing agricultural practices and market sales.

M-KOPA

M-KOPA, an asset financing company founded in Kenya in 2012, initially focused on selling solar energy systems to predominantly rural-based, low-income consumers on a pay-as-you-go basis. The company has since built an advanced financing platform to lease products to customers who could otherwise not afford them, expanding its product line to include mobile phones, electric motorcycles, and into Uganda, Nigeria, and Ghana. **M-KOPA's sales agents, about 45 percent of whom are women, come from the communities they serve and have deep social networks in hard-to-reach areas**. M-KOPA's agent network and financing model has helped the company to narrow the gender gap in access to digital financial services, smartphones and other life-enhancing products: 40 percent of M-KOPA's products are primarily used by women (M-KOPA 2021).

Kuza One

Kuza One, a certified B Corporation (social enterprise) in Kenya, runs **Rural Entrepreneur Development Incubators (REDI) that engage and mentor enterprising rural young women as "Agripreneurs" and equip them with specially designed portable digital kits**. The kit comes with an android tablet with built-in Kuza apps, a self-powered portable digital projector to screen HD video content on Good Agricultural Practices to farmers in local languages, using technology that powers immersive customer experiences even in remote, off-grid locations. Agripreneurs earn farmers' trust by providing free advisory services at the farm gate, which in turn generates demand for the agricultural products and services they sell. Kuza has over 5,000 Agripreneurs (40 percent of whom are women) serving 750,000 farmers (65 percent of whom are women) in Kenya, Uganda, Rwanda, Tanzania, Ethiopia, India, and Bangladesh.

DigiCow

DigiCow Africa in Kenya (formerly Farmingtech Solutions) is an agtech enabling data-driven decision-making by transforming how farmers access verified, cow-specific, timely animal husbandry training. DigiCow also hires young Digital Farm Assistants to aggregate farm inputs and services, making it cost-effective for both suppliers and farmers and creating youth employment. The DigiCow plaform also supports veterinary service providers with digital record keeping tools. It has responded to the central role of female farmers in food production and designed its platform to cater to the working needs of women farmers. As a result, **62 percent of DigiCow customers are women**.

2. INFORMATION AND ADVISORY SERVICES

Information and advisory services focused on climate-smart agriculture and adapted to the needs of rural women

Information and advisory services—particularly when paired with quality seeds, fertilizers and access to markets—can help increase yields and incomes. And compared to men, when women have access to training and advisory services, they see larger increases in agricultural productivity (FAO 2020b).

The accelerating impacts of climate change make access to information and training on climate-smart agriculture practices increasingly important.

But rural women typically have limited access to such services. Standard extension services have not focused on the crops and livestock most pertinent to rural women, and often overlook women due to their mobility, literacy, and time constraints. Furthermore, in contexts where social norms restrict male-female interaction, training provided by men in majority-male groups excludes women.

Informal social networks play an important role in sharing agricultural, weather, and price information, while also supporting farmers' adoption of technologies. However, because women tend to have smaller and more homogeneous social networks, female farmers have less access to information of quality and relevance than their male counterparts (Banerjee et al. 2014; Quisumbing et al. 2019).

Information and advisory services can help to overcome women's differential access. By delivering information and advisory directly to women's phones or equipping local agents with digital content that they can share with their communities, these services can provide women with the timely information and training they need to respond to climate change.

Information and advisory services can also be customized to specific locations and climate needs. Localization can deliver, for example, tailored climate-smart agricultural guidance as well as essential emergency response information like when and where to evacuate (Davidson, Koyama, and Habershon 2022a).

But tailoring these services to the needs of rural women means first addressing barriers such as lower rates of phone ownership and literacy. Local language content, especially when delivered using audio and video, can help to ensure it is accessible to women. Additionally, agents can be equipped with devices that allow them to disseminate content to women who do not own smartphones.

Women farmers receive only 5 percent of overall agricultural extension services (Roscoe and Hoffmann 2016).

Among subscribers of iShamba, a mobile-based farmer information service, almost half of whom are women, 95 percent reported an increase in their farm production and 93 percent reported at least some increase in farm revenue (Mercy Corps AgriFin 2022).

In Mozambique, farmers with access to information sold maize at an average price per kilogram 12 percent higher than farmers without information (Njuki and Sanginga 2013).

Returns to farmers from digital climate-informed advisory services (DCAS) average 30 percent on productivity and 25 percent on income (Ferdinand et al. 2021). And when women have access to training and advisory services they see larger increases in productivity than men (FAO 2020b).

APROMAC

APROMAC, the professional association of rubber producers in Côte d'Ivoire, tested variations of their standard agricultural extension training on starting and managing a rubber plantation in 2016. In 2018, APROMAC found that **including both husbands and wives in trainings on crop cultivation and farm management was most successful**. These households more highly prioritized input use, increased investment in agricultural activities, and reduced traditional gendered divisions of labor (Donald, Goldstein, and Rouanet 2022).

Afriscout

Afriscout in Ethiopia, Kenya, and Tanzania is the "shepherd's eye in the sky." Afriscout is a smart phone application **incorporating traditional and cultural practices and migration areas to help pastoralists locate water and forageable land** for their animals and to make informed and cost-effective migration decisions. Developed with and for pastoralists, Afriscout's crowd-sourced system of geolocated alerts facilitates collaboration on land management and allocates specific areas to different pastoralists (Afriscout 2022 and 2020).

Women's Weather Watch

Women's Weather Watch in Fiji engages female leaders to deliver simplified weather alerts and early warnings to disadvantaged women and groups in remote areas. Run by femLINKpacific and the Fiji Meteorological Service, their **two-way communication platform makes information accessible to women via community radio, SMS, and social media platforms**. It also collects real-time situation updates from network members to ensure more gender-inclusive disaster preparedness, response, and recovery (WMO 2017).

Learn.ink

Learn.ink is a mobile training platform that helps organizations build effective, affordable microlearning courses and then track their reach, use, and impact. With Mercy Corps AgriFin support, Learn.ink developed **training modules for rural extension officers and sales agents to build awareness about climate change** and its impacts on the rural populations they serve. The goal is to help agents better market products and services that can support rural populations adapt to climate change. Learn.ink technology also enables organizations to tailor agent recruitment programs and training to female agents. Launched in 2022 and available for free to all Learn.ink customers, around 1,700 field agents adopted the training modules in the pilot and passed on the information to around 17,000 smallholder farmers.

Shamba Shape Up

Shamba Shape Up (SSU) is a reality farm make-over TV show in East Africa that supports climate-smart practices to increase production. Produced by Mediae, **it reaches 8 million weekly viewers in Kenya, about half of whom are women** (Shamba Shape Up 2021). Working with the WomenConnect Challenge, Mediae also created a set of short videos, now found on the Africa Knowledge Zone and Sprout, to de-mystify the effects of climate change and promote practices like soil and water management that help farmers adapt.

iShamba

In Kenya SSU also offers iShamba, a mobile-based farmer information service that disseminates regular weather advice, timely agricultural information, and best farming practices, reaching 500,000 subscribed farmers, 43 percent of whom are women. The iShamba call centre is staffed by agricultural experts and answers farmers' questions via SMS, phone, and WhatsApp six days a week. In 2020 with CIAT, iShamba also developed Let It Rain, **a weather gamification initiative to incentivize farmers' uptake of localized weather advisory** (Mercy Corps AgriFin 2022).

3. INPUTS

Climate-smart inputs, such as improved seeds and fertilizer, that increase rural women's productivity, efficiency, and resilience

Climate-smart inputs are designed to increase productivity, protect natural resources, save producers' time, and build resilience to climate change. Drought- and heat-resistant seeds germinate with less rain than standard seeds, soil tests generate guidance on building soil health, irrigation helps cope with longer dry spells, and training promotes regenerative practices like low-till methods and crop rotation.

However, the adoption of climate-smart inputs such as improved seeds and fertilizer is relatively low in Africa, particularly among women (Banerjee et al. 2014). Women may also have less access to new seed varieties and the information required to grow them (Mwakanyamale et al. 2021). Despite their potential, rural women are less likely have awareness, access, or decision-making power on climate-smart inputs, limiting their response to climate change (Davidson, Koyama, and Habershon 2022b).

In response, providers are increasingly leveraging innovative financial services business models to expand women's access to climate-smart inputs. Financing for inputs bundled with agricultural information and training can narrow the productivity gap between male and female farmers (Banerjee et al. 2014).

In Malawi, women farmers use lower levels of improved seeds, inorganic fertilizer, and extension services on their plots than men, a difference that accounts for over 80 percent of the gender gap in agricultural productivity (Banerjee et al. 2014).

Ensuring that women farmers have the same access as men to fertilizer and other agricultural inputs, as well as training on their safe and effective application, would increase maize yields by 11-16 percent in Malawi and 17 percent in Ghana (WBG 2012).

CropNuts

CropNuts (Crop Nutrition Laboratory Services) in East Africa focuses on providing soil testing and agronomic advisory services for smallholders through a B2B partnership model with input suppliers, aggregators, financial services, development partners and the public sector. Through its Africa-wide franchise soil lab and digital soil mapping platform, it provides **low-cost AI soil data to smallholders** to better advise on soil health, input choice and application, and regenerative farming practices to save farmers money, improve yields, and increase income, and so building income and climate resilience (CropNuts 2018).

Apollo Agriculture

Apollo Agriculture in Kenya and Zambia helps small-scale farmers adapt to risks of climate change and make more money by improving yields. Serving over 320,000 farmers, over half of whom are women, Apollo uses its **proprietary tech platform and a network of field agents** to help farmers access high quality inputs, insurance, and advisory, all instantly enabled on credit. In Kenya, in partnership with Mercy Corps AgriFin, Apollo is exploring how investments in soil mapping data can improve yields among small-scale farmers, thus delivering greater value through its input financing and advisory services.

myAgro

myAgro is a social enterprise in West Africa that allows smallholder farmers to pay in small increments in advance for packages climate-resilient inputs using a mobile layaway plan. Women make up more than half of myAgro customers, thanks to their deliberate steps to better reach and serve them. For example, myAgro **deliberately hires women as agents in communities they serve, provides women-tailored agricultural trainings, and uses gender-disaggregated performance data** to ensure their agricultural products and services address the specific barriers and ambitions of women farmers (myAgro 2022).

World Relief

World Relief in Rwanda works through church networks to reach rural households, particularly women. It facilitates Village Savings and Loan Associations (VSLAs) and Farmer Field Schools (FFS) designed to build skills, increase investments in agricultural inputs like seeds and fertilizer, and enhance resiliency. **Participants in both VSLAs and FFS increased crop production by 75 percent** and 40 percent decreased their status as food insecure (Schneider 2020).

AgroMall

AgroMall in Nigeria works with smallholders and other value chain actors to drive increases in agricultural productivity. AgroMall offers credit for inputs but saw little uptake from women due to their lack of collateral such as land required to qualify for loans. So with support from CGAP and Mercy Corps AgriFin, AgroMall developed and tested a **credit scoring model targeting women who lacked access to collateral** to qualify for unsecured digital input loans (Obodoekea, Agbejule, and Olusanmokun 2021).

Image credit: Original (store front) photo from which illustration was based: ©IFAD/Isaiah Muthui

4. SAVINGS

Savings products that allow rural women to respond to shocks and fund investments in adaptation

Savings can provide a safety net against climate shocks, as well as help to invest in personal and household needs. Drawing on savings can also help avoid negative coping strategies such as sale of assets, reduced food consumption, or taking on additional debt (Sandri, Beckmann, and Robinson 2021).

Accumulating savings can also allow rural women to invest in improved inputs, irrigation systems, solar cells, biodigesters, and other climate-resilient solutions that reduce drudgery, save time, and generate energy (Davidson, Koyama, and Habershon 2022a).

Rural women tend to be active savers and often use community-led, informal savings and lending groups like Village Savings and Loan Associations (VSLA), Self-Help Groups, and Savings and Credit Cooperatives (SACCOs). Women may also save in-kind, using tangible assets such as livestock and jewelry as savings mechanisms. These types of savings mechanisms appeal to women due to their flexibility and proximity, and are also more accessible given women's lack of formal identification documents, low trust in formal savings services, and limited access to mobile phones (Anderson 2021; Davidson, Koyama, and Habershon 2022a; Rickard and Johnsson 2018).

But informal savings mechanisms have their limitations, including difficulties mobilizing capital for larger investments and overcoming covariant risk. Because members tend to engage in similar economic activities, informal savings groups may struggle in the event of community-wide shocks that prompt mass withdrawals of savings, such as climate events (Davidson, Koyama, and Habershon 2022b).

As a result, a number of providers are adopting new approaches to provide women with access to tailored, formal savings products. These products often leverage community-led savings mechanisms to connect women with formal savings for the first time.

In 2018, over 917,000 people in 51 countries joined a CARE-supported village savings and loan association (VSLAs), and over 81 percent of them were women. Each year these groups mobilize over $500 million in savings (CARE 2019).

In Côte d'Ivoire, female workers in cashew-processing plants were offered a direct-deposit commitment savings account designed to make it easier for them to convert productivity increases into long-term savings inaccessible to others. The result: Workers who opened the account increased their work attendance by 10 percent and earnings by 11 percent (Carranza et al. 2022).

In villages around Lake Victoria in Kenya, women were much less likely to use their money when they saved it in M-PESA, a mobile banking service that allows users to store and transfer money through their mobile phone, compared to saving cash in their homes (White 2012).

Global Fund for Widows

Global Fund for Widows, operating in Kenya, Egypt, Tanzania and Malawi, organizes Widows Savings and Loan Associations (WISALA), a **community banking solution that offers widows access to capital and savings** which help build a credit history. With a sustainable and permanent source of capital, widows and female heads of households use the WISALA to launch and expand micro-enterprises, many of which are centered on agricultural activities (GFW 2022; Ibrahim-Leathers and Mecca 2019).

USAID

USAID-supported VSLAs in Ghana found that women used these savings to increase the size of their plots, purchase higher-quality seeds and fertilizers, pay for plowing services, and diversify production beyond staple crops like maize or rice to soybeans, cowpeas, okra, and peppers. **Women using VSLAs also invested in additional income-generating activities during the lean dry season**, including raising livestock, processing shea and groundnuts, hairdressing and tailoring, and selling clothing (USAID and ACDI/VOCA 2020).

HerVest

HerVest in Nigeria uses a mobile phone application to offer a savings service: They **target urban women savers and then on-lend to rural women borrowers**, most of whom are working in agriculture. HerVest also provides training on financial literacy and agricultural best practices and links women farmers to quality seeds and fertilizer, information, and premium markets. HerVest engages 40,000 women on its platform and finances about 1,000 of them, and now is expanding beyond the agricultural sector.

Equity Bank, Equitel, and CARE

Equity Bank, Equitel, and CARE in Kenya developed a mobile-based solution that maintains the security features associated with the traditional VSLA cash box. The Equitel solution allows women's savings groups to make deposits and withdrawals via Equity agents; VSLA members can also transfer funds between group and individual accounts at no charge. **This digitized approach to group savings reduced fees and travel costs** for members and attracted new groups to open accounts (SEEP Network 2017).

ZANACO

ZANACO in Zambia designed the AgriPay digital platform for smallholders. Its features are intended to help small-scale growers mobilize savings and make investments that increase their income, resilience to shocks, and agricultural productivity. The **most valued financial product on the AgriPay platform has been the savings account**. Farmers, especially women, value a safe place to store funds and earn interest on their savings (Mercy Corps AgriFin 2019).

5. CREDIT

Credit products that allow rural women to invest in climate-smart agriculture

Rural households need access to a range of financial services, including credit, savings, insurance, and payment solutions, to increase production, secure assets, and access markets (AGRA 2013; Anderson 2021).

But rural women qualify less often than men for formal credit from traditional financial service providers, limiting the profitability and diversification of their livelihoods (AGRA 2013). Key barriers preventing women from accessing credit include lender requirements such as formal identification and land to use as collateral.

Rural women also tend to have lower levels of trust in formal lenders, a limited understanding of formal borrowing, and less confidence in using it (Davidson, Koyama, and Habershon 2022a).

Lack of access to credit has important implications for rural women's climate resilience. Practices like low-till agriculture, more resilient crop choices, organic fertilizers, and solar-powered irrigation can have a longer-term benefit. But for rural small-scale producers, especially women, they can also pose significant upfront costs and uncertainty.

Access to credit, combined with training and extension services, can help make climate-smart, regenerative agricultural practices more affordable for rural women. And innovations in digital credit approaches are increasingly breaking down barriers to women's access to credit. For example, providers are testing approaches like psychometric credit scoring that can overcome women's collateral challenges (Alibhai et al. 2018).

In Kenya, women provide an estimated 75 percent of agricultural labor but own only 1 percent of the land, meaning they cannot use it as collateral to access credit. Women make up 48 percent of business owners but receive only 7 percent of formal credit (AGRA 2013).

In Ghana, the key factors affecting how women farmers adapt to climate extremes were the age of the farmer, climate information, asset holdings, access to credit, and agricultural extension services. Access to credit among women farmers positively influenced their planting dates in response to drought and relocation from flood-prone areas as targeted adaptation measures (Owusu and Yiridomoh 2021).

Women's Micro Bank Limited

Women's Micro Bank Limited (WMBL) in Papua New Guinea developed a biometric solution that enables women produce sellers in rural markets to access bank accounts for their market transactions. Women selling produce typically have very low literacy and lack phones or any form of legal identity. The WMBL **biometric solution allows them to visit agents located in markets** to conduct digital transactions, access loans to expand their market businesses, and build secure savings and credit histories (Highet 2022).

Sterling Bank and Mastercard Foundation

Sterling Bank and Mastercard Foundation developed the SWAY AgFin solution, a **low-interest credit facility to drive the participation of women and youth in agribusiness**. SWAY AgFin is set to finance 100,000 new and experienced farmers across Nigeria, to provide them with the needed capital to expand their agric-focused businesses.

VisionFund

VisionFund in Tanzania, Rwanda, Ghana, and Zambia facilitated **loans from financial service providers to community savings groups**. A group's capacity was assessed based on its share-outs, internal loan repayments, and member retention rate. With no collateral requirements, the loan was issued to the group, disbursed to its fund, and managed according to its normal lending criteria and processes. Over three years, average savings per member increased by 71 percent and the average loan size increased from $40 to $64 (Lewin 2019).

BRAC International Microfinance

BRAC International Microfinance in Myanmar, Liberia, Sierra Leone, and Rwanda has been testing and scaling agrifinance loans specifically designed to meet the needs, preferences, and behaviors of women farmers living in poverty. In recent pilots, **over 90 percent of its agrifinance clients were accessing formal credit for the first time** and cited the products' flexible repayment frequencies (e.g., bullet payments, grace periods) and adapted eligibility criteria, with no collateral requirement for most loans, as key value drivers (Lesher, Okumura, and Bogatu 2021).

MiBank

MiBank in Papua New Guinea has a sizeable presence in the Highland region, serving women working in the coffee supply chain with **access to mobile wallets and credit**. In areas where increasing rainfall and erosion threaten agricultural production, these financial tools enable women to invest in inputs such as pest-resistant seeds and agricultural tools designed to increase the volume of berries that they can take to market and improve their livelihoods (Highet, Sipani, and Egi 2022).

Muktinath Bikas Bank Limited and International Development Enterprise

Muktinath Bikas Bank Limited and International Development Enterprise (iDE) in Nepal partnered to reach and serve rural farmers, especially women and other marginalized groups, with wholesale agricultural finance and crop insurance managed by community aggregation centers linked to agricultural technical support provided by Community Business Facilitators (CBFs). Their pilot offered a variety of **credit and crop insurance products to facilitate investments in climate-smart agriculture technologies** designed to increase commercial vegetable production and household income. Of the 1,000 farmers in the pilot, 80 percent of borrowers were women; this group increased their income from vegetable crops three-fold and repaid 100 percent of their loans. Farmers working with female CBFs earned on average 20 percent more than those working with male CBFs (Limbu 2019; MEDA 2021; Schneider 2020).

6. INSURANCE

Tailored insurance products that protect rural women's agricultural investments against climate risk

In times of crisis, due to power imbalances within households, women's assets, crops, and savings are often the first to be liquidated (FAO 2020a; Tiwari et al. 2020).

Use of insurance among rural women could mitigate some climate risks and increase the security of adopting climate-resilient practices, particularly when bundled with a suite of other financial and non-financial services (Anderson 2021; Davidson, Koyama, and Habershon 2022a).

But rural women typically have little experience with insurance. As a result, they often have a limited understanding of how it works and may mistrust insurance providers. Insurance products are also rarely designed with women's preferences in mind. For example, women may lack the funds needed to pay premiums upfront.

Some insurance providers are increasingly making premium payments more flexible in order to make insurance more accessible to women. And to address women's lack of understanding and mistrust of insurance products, insurance providers are testing educational approaches and working through trusted community organizations.

Additionally, there is a need to communicate the benefits of insurance coverage in ways that align with women's priorities. For example, highlighting the household benefits of purchasing insurance, such as allowing women to pay children's school fees and ensuring the health and well-being of their families, resonated more than messages focused on returns on investment (USAID 2022).

A study in Burkina Faso and Senegal found that farmers who purchased insurance were more likely to use inputs compared to those relying on savings to manage risk. Farmers who purchased more coverage also saw higher average yields and were better equipped to cope with food security and shocks (Delavallade et al. 2015).

Pula, an African agricultural insurance provider, found that insurance was more likely to increase women's investments in their farms when compared with men. 81 percent of Kenyan women were more comfortable buying seed bundled with insurance coverage compared to 72 percent of men (Pula 2020).

ACRE Africa

ACRE Africa, a service provider working with local insurers in Kenya, Rwanda, and Tanzania to facilitate smallholder access to crop and livestock insurance, found that women were less likely to have cash for one big lump sum premium payment and bought only 25-50 percent of the insurance coverage that men bought. ACRE then made its **premium payment more flexible, letting customers buy small premium top-ups via mobile money** over an extended period, eventually accumulating into meaningful coverage. ACRE also increased outreach to women already gathered in savings and church groups and bundled insurance with credit and training on good agricultural practices (USAID 2022).

Weather Index-based Risk Services

Weather Index-based Risk Services (WINnERS) in Tanzania is a de-risking framework for stakeholders in staple food value chains that aims to increase smallholders' access to credit, inputs, and markets. The **premium that farmers pay for WINnERS insurance depends on their use of agricultural practices** that increase crop resilience to heat and drought. Designed by EIT Climate-KIC, Imperial College London, and École Polytechnique and supported by EIT Climate-KIC, its contracts have incentives to improve the gender equality of farming cooperatives, including the presence of women in management roles (Mercy Corps AgriFin 2020b).

Shamba Shape Up

Shamba Shape Up (SSU), is a reality farm make-over TV show that has been running in Kenya since 2010 and launched in Uganda in 2021 and Zambia in 2022. Produced by Mediae, it reaches 8 million weekly viewers in Kenya, about half of whom are women (Shamba Shape Up 2021). SSU and IFPRI developed the Wise Woman episode, a **short drama about the purchase of crop insurance**. Featuring two couples with two very different approaches, IFPRI uses the episode to start conversations about household decision-making and gender-based violence, as well as the role of crop insurance in risk management. IFPRI research after the screening of the short drama found that women's input in productive decision-making increased by 5 percentage points (Aju, Kramer, and Waithaka 2022).

R4 Rural Resilience Initiative

The R4 Rural Resilience Initiative, a collaboration between the World Food Programme and Oxfam America, uses an integrated climate risk management approach to allow the poorest farmers to purchase crop insurance by participating in risk reduction activities. By 2021, R4 had benefited 395,000 vulnerable households in multiple climate-affected countries. **Farmers with crop insurance in Ethiopia reported saving twice as much as those without it** and invested more in seeds, fertilizer, and productive assets. In Senegal, women with crop insurance reported having greater access to land, seeds, and water. In Kenya, 87 percent of insured households were women-headed (WFP 2022).

7. LABOR-SAVING ASSETS

Financial services that allow rural women to obtain a range of tools to save their time and energy

Rural women have less access than men to the labor and labor-saving assets needed to power their farms and businesses and manage their households. They are responsible for a disproportionate burden of unpaid household labor — childcare, collecting water, cooking, and washing. These tasks consume a significant portion of their personal and productive time, constraining their livelihoods, income, and resilience and driving the gender gap in agricultural output (Anderson and Donald 2022; Davidson, Koyama, and Habershon 2022b).

Climate change exacerbates this. For example, women and girls must travel further distances to fetch water and fuel, increasing their time poverty and vulnerability to violence (Davidson, Koyama, and Habershon 2022a). Climate change can also place pressure on the timing of planting and harvesting, making it even more important for women to have time at critical points in the crop cycle.

Time- and labor-saving assets can help women use their time more efficiently. But rural women are less likely than men to access or own labor-saving tools, including both assets that reduce time on unpaid household labor (e.g., biodigesters) and assets that facilitate agricultural production (e.g., weeders, seeders, spreaders, ploughs, tractors). These assets can save time and effort, increase productivity and incomes, and mitigate the impacts of climate change (Davidson, Koyama, and Habershon 2022b).

And labor-saving tools are often designed for men. Women often find them too large or heavy to comfortably use and dangerous to keep near children, limiting their adoption (FAO 2011; Kawarazuka 2018; Mehta, Gite, and Khadatkar 2018; Vemireddy and Choudhary 2021).

Energy-efficient technologies tailored to women's ergonomics and responsibilities can play an important role in rural women's lives and livelihoods. And financial services are increasingly putting them in reach for rural women.

Solar-powered irrigation systems, tailored hand tools and tillers, biomass cookstoves, and LPG cooking fuel — all financed using innovative business models — can save rural women time and effort, as well as increase energy efficiency and reliability and reduce CO2 emissions (Davidson, Koyama, and Habershon 2022b).

An estimated 2.8 billion people still burn solid fuels such as wood and animal dung for cooking and heating (IEA et al. 2020). Women in these households spend an average of 18 hours per week gathering firewood (UN Women 2021).

Time-use analysis in nine African countries found that women spend an average of 15-22 percent of their time on household tasks (like cooking, washing clothes and fetching water and fuelwood) compared to 1-9 percent for men (FAO 2020b).

In Malawi and Tanzania, women's lower access to farm labor is one of the largest drivers of the gender gap in agricultural productivity. Closing the gap in the male labor that women farmers use could yield gross gains of over $45 million in Malawi and over $100 million in Tanzania (UN Women, WBG, and UNDP 2015).

In Côte d'Ivoire, women growing cottovn could not harvest in the peak period due to their limited access to labor. Due to the lower quality of their late harvest, they earned less 10 percent less per kilogram for their output (Carranza et al. 2017).

SunCulture

SunCulture, which has a presence in East and West Africa, designs, sells, finances and provides after-sales support for solar water pumps for smallholder farmers. Solar water pumps are more cost- and time-efficient than expensive, labor-intensive fuel, treadle, or electric pumps. SunCulture also finances **drip irrigation systems, which can reduce water usage by up to 90 percent and increase yields up to 300 percent**. By keeping water from resting on the soil surface, drip irrigation also helps mitigate pests and weeds (Vranken 2021).

Hello Tractor

Hello Tractor is an agricultural technology company that leverages **remote sensing technology, digital payments and a digital platform to connect farm equipment owners with small-scale growers** in need of mechanized services. Hello Tractor is working toward sustainable mechanization, using rippers instead of disk ploughs to maintain soil structure and biological activity, increase soil fertility, and reduce water erosion (Munene 2021). Using a targeted last-mile marketing strategy, Hello Tractor is also working to increase the number of women who book its services and apply for pay-as-you-go loans, which is particularly important since large assets like tractors are typically owned by men (Hello Tractor 2021).

Precision Development

Precision Development (PxD) in Kenya provides **asset-collateralized loans (ACLs) for dairy farmers to purchase water tanks**, in partnership with the University of Chicago's Development Innovation Lab (DIL) and the Lessos and Sirikwa Dairies cooperatives. Dairy farmers in Kenya are severely affected by a changing climate and face water shortages that negatively affect milk production and increase time burdens for women and girls. ACLs offer an opportunity for smallholder farmers who are unable to obtain loans from traditional lenders to invest in water tanks to ensure year-round water access by harvesting rainwater or storing piped water when available. Building on rigorous evidence, ACLs have the potential to not only increase profits for farmers and the welfare of their livestock, they can also improve the well-being of women and girls most impacted by climate change.

Sistema.bio

Sistema.bio is an international biogas company that designs, manufactures, finances, and installs biodigesters and biogas appliances for smallholder farmers. By turning organic waste into energy, **biodigester technology offers a sustainable waste management solution and produces organic fertilizer** for farms and clean energy for households, and saves women the time of gathering firewood for cooking (Jha and Coll 2021).

PEG Africa

PEG Africa in West Africa provides financing for solar water pumps, with an emphasis on reaching rural women. PEG **leverages women's groups like VSLAs to disseminate information about solar water pumps** and their credit scorecard is also designed to overcome traditional barriers to financing for women. It incorporates alternatives to often discriminatory criteria (e.g., asset ownership) and recognizes women's stronger repayment behavior relative to men. As a result of cost, time, and labor savings, PEG's women customers report increased crop yields and higher incomes, as well as improvements in household health from access to clean water and reduced exposure to fuel pump emissions (Agbejule, Mattern, and Mensah 2022).

8. POST-HARVEST STORAGE

Tailored solutions to protect rural women against post-harvest loss

Rural women often manage multiple post-harvest activities, including threshing, drying, winnowing, cleaning, processing, storing, and marketing. They may store grains after harvest, for example, in impermeable bags and containers, earthen pots, or bamboo baskets to use later as seeds and for household consumption.

But containers made from natural materials are unfortunately not moisture- or insect-proof. As a result, an estimated 50-60 percent of post-harvest losses occur in the storage stage, reducing the availability and quality of production for consumption, sale, and use as seeds.

Rural women face multiple barriers to their awareness and adoption of improved options for post-harvest storage. They have limited access to information, agency to adopt new technologies, and ability to finance new approaches or assets (Jones 2020).

And poor post-harvest storage, food waste, and climate change are interlinked, considering the wasted energy, water, and inputs in its production and the methane generated by decomposing food. Food loss and waste generate 8 percent of global greenhouse gases (FAO 2015) and the increased temperatures and pest damage associated with climate change make post-harvest handling more challenging (TechnoServe 2022).

Small-scale producers — particularly the rural women managing these activities — need better access to improved post-harvest services and logistics, including affordable packing materials and cold chain storage and transportation. While the energy required to power traditional cold chains can contribute to carbon emissions, renewables and other technologies can help to minimize any additional emissions produced.

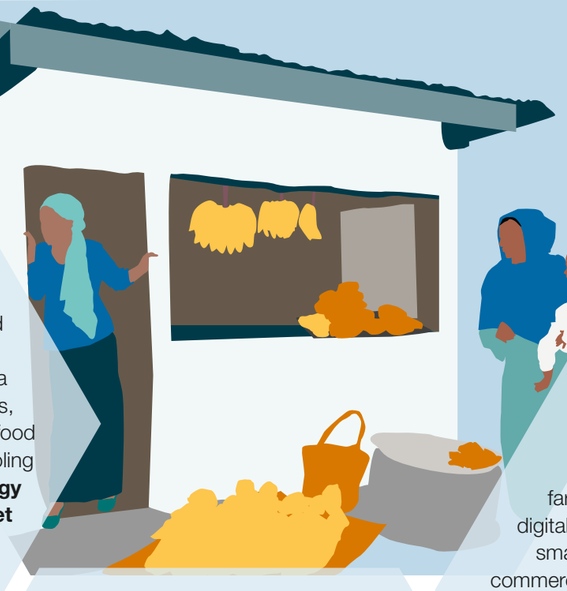
And with the ability to better time sales and add value to crops, producers can maximize prices and income, reduce food waste and post-harvest loss, and increase their climate resilience, in addition to reducing an important driver of climate change (TechnoServe 2022).

In Nigeria, about half the tomato crop is lost every year after harvest (TechnoServe 2022).

Among tomato growers in Ghana, women farmers harvested tomatoes over a longer period of time due to their time constraints and lower access to hired labor, which led to significantly higher levels of post-harvest loss than for male farmers (Aidoo, Danfoku, and Mensah 2014, FAO 2020b).

In sub-Saharan Africa, approximately 50 percent of fruits and vegetables never reach the consumer (Bayer Foundation 2022).

In Kenya, about Ksh 72 billion ($530 million) of food is lost every year (Mbatia 2021).



InspiraFarms Cooling

InspiraFarms Cooling engineers and delivers modular and energy-efficient precooling and cold chain technology for fresh fruit and vegetables, flowers, and animal protein supply chains in Africa and other emerging markets. They provide farmers, agribusinesses, exporters, third-party logistics, and food distributors with sustainable and state-of-the art cooling solutions to handle any perishable. This **cuts energy costs, reduces food losses, and helps to meet international food safety certifications**. The technology integrates groundbreaking real-time data to monitor products and performance, maximizing the returns of customers.

ColdHubs

ColdHubs in Nigeria offers **solar-powered walk-in cold rooms for the off-grid preservation and storage of perishable foods**. Designed to reduce post-harvest loss and food waste and increase farmer incomes, ColdHubs are installed in major food production and market locations. Farmers place perishable foods into reusable crates and stack them onto the ColdHub shelves, paying a daily flat fee for each crate they use. ColdHubs managers at each unit, all of whom are women, collect these fees and oversee local operations, while a central operating team monitors several digital sensors in each unit to ensure they function smoothly and pre-empt maintenance. ColdHubs also runs a refrigerated transportation service that ensures end-to-end movement and storage of food at best temperatures and packaging and transportation conditions. Presently they have more than 60 hubs in 22 out of 36 states of Nigeria with more to come in 2023.

SokoFresh

SokoFresh in Kenya offers a farm-level cold-storage service and digital market linkage platform to integrate small- and medium-scale farmers into commercial value chains. It uses a **mobile cold storage solution that allows farmers to pay for small amounts of storage for flexible time periods**. The flexibility of their model makes cold storage more accessible to smallholders, thus helping to ensure produce quality and protect against post-harvest loss.

9. TRANSPORT AND LOGISTICS

Transport and logistics services that advance rural women's access to markets and opportunities

Transportation infrastructure and first- and last-mile logistics are both essential aspects of rural supply chains and are vital to rural livelihoods. Their quality and density impacts travel time to markets and agricultural productivity (Donald, Goldstein, and Rouanet 2020; Mercy Corps AgriFin 2020a).

Less time to market means increased agricultural production and more income for farmers, as well as lower energy, emissions, and food waste — all of which are key drivers of climate change.

And that 'first mile' from rural households — the initial distance that agricultural product travels from farms toward the first point of commercial opportunity (e.g. collection points, aggregating hubs, local markets) — can be the most costly part of the journey to market (Njenga 2015, ReCAP 2015).

Rural women also face social constraints that limit their mobility and use of transportation. These gendered norms impact rural women's decision-making on and ability to flee destructive climate events like floods and droughts, increasing women's exposure to harmful climate shocks and reducing their ability to adapt their lives and livelihoods to changing surroundings (Davidson, Koyama, and Habershon 2022b).

The first-mile stages of moving agricultural outputs are the most expensive and can account for over 20 percent of total transport costs (ReCAP 2015).

Reducing smallholders first-mile travel distance by 35 percent to an average of 1.3 kilometers will decrease their last-mile logistics costs by 35 percent (Mercy Corps AgriFin 2020a), therefore increasing their agricultural income.

In areas of sub-Saharan Africa where travel to markets took less than 4 hours, total crop production approached 50 percent of the region's maximum agronomic potential. As travel time to markets increased, agricultural production decreased markedly: Farms 8 or more hours from markets reached less than 10 percent of their region's maximum agronomic potential (Dorosh et al 2012; Fuglie 2020).

Copia

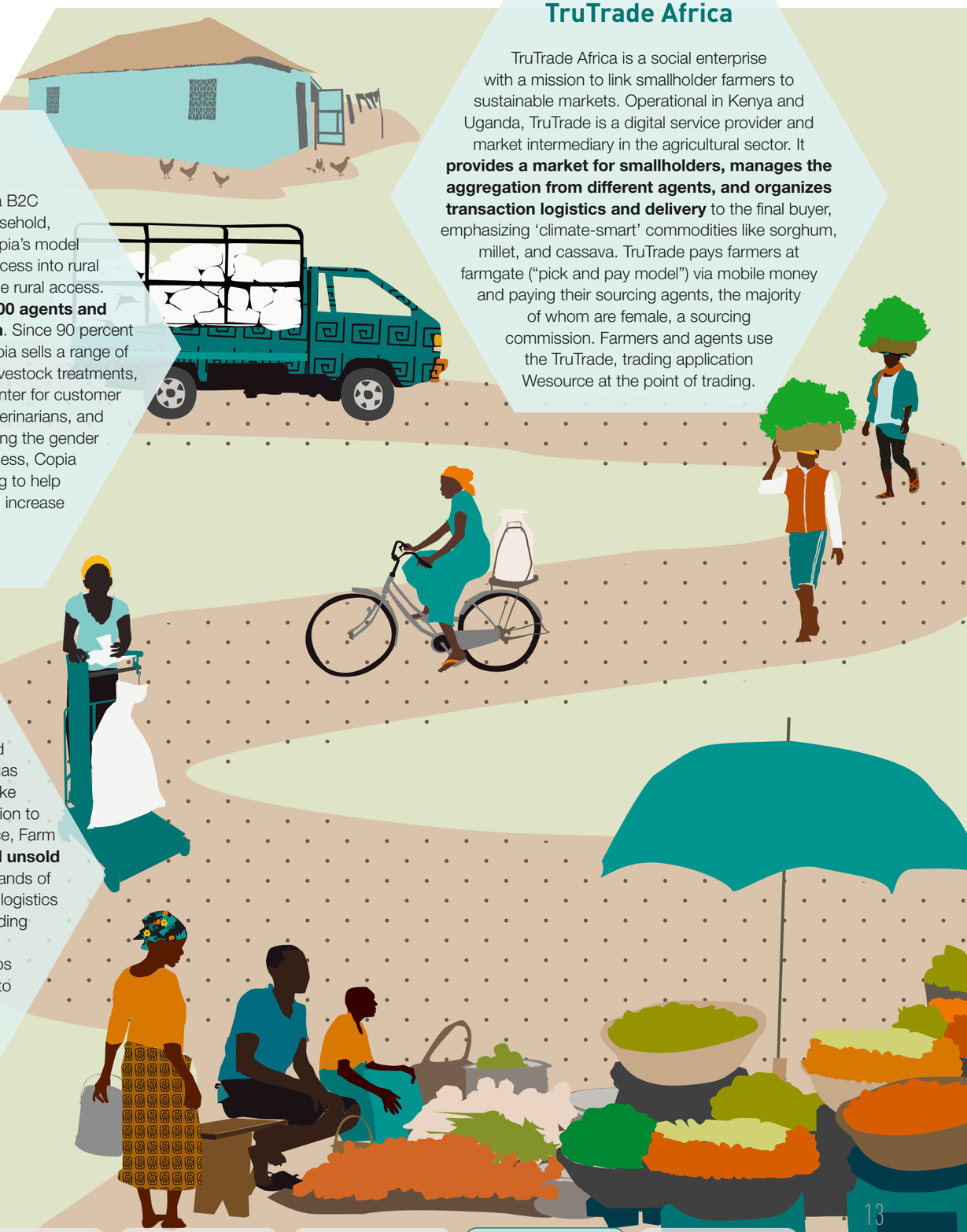
Copia in Kenya and Uganda is a B2C eCommerce company selling household, electronic, and agricultural goods. Copia's model relies heavily on field agents to bridge access into rural areas and manage the logistics of last mile rural access. At Copia, **over 80 percent of their 40,000 agents and 75 percent of their customers are women**. Since 90 percent of customers are engaged in agriculture, Copia sells a range of agricultural goods and services (e.g., seeds, livestock treatments, soil testing), manages an agricultural call center for customer questions, and includes agro dealers, veterinarians, and agronomists as Copia agents. Recognizing the gender gap in mobile phone and internet access, Copia launched an asset-financing offering to help agents purchase a smartphone and increase their efficiency and income (Maftei et al. 2022).

Farm to Feed

Farm to Feed is a digitally-enabled platform focused on reducing food loss and waste. Its services help reduce greenhouse gas emissions, increase farmer incomes, and make nutritious food affordable to consumers. In addition to selling Grade One and Grade Two (perfect) produce, Farm to Feed **sources and aggregates imperfect and unsold produce at its Supply Hubs** located near thousands of smallholder farmers in Kenya. It then manages the logistics and distribution to a range of customers, including feeding programs, retail markets, and food processors, at affordable prices. Mercy Corps AgriFin worked with Farm to Feed in Kenya to develop its technology platform, which helped increased its network from 800 to 6,000 smallholders, most of whom are women.

TruTrade Africa

TruTrade Africa is a social enterprise with a mission to link smallholder farmers to sustainable markets. Operational in Kenya and Uganda, TruTrade is a digital service provider and market intermediary in the agricultural sector. It **provides a market for smallholders, manages the aggregation from different agents, and organizes transaction logistics and delivery** to the final buyer, emphasizing 'climate-smart' commodities like sorghum, millet, and cassava. TruTrade pays farmers at farmgate ("pick and pay model") via mobile money and paying their sourcing agents, the majority of whom are female, a sourcing commission. Farmers and agents use the TruTrade, trading application Wesource at the point of trading.



10. MARKETS

Digital marketplace platforms that allow rural women to connect with buyers offering better terms and prices

Due to their time, mobility, and social constraints, women are less likely to access brokers and traders, who are typically men. Women also have lower access to the price and market information that would allow them to shop around for the best buyer.

When women struggle to access markets, it can constrain their ability to adapt to climate change. For example, unable to reach buyers seeking more climate-resilient crops like sorghum and millet, women may not realize the profit potential of diversifying into these crop types. Lower prices offered by informal traders and local markets can also limit women's return on investment and can disincentivize women from investing in adaptation and climate-smart agriculture. And because formal off-takers often provide financing for inputs, extension services, post-harvest storage and transportation, reliance on informal buyers can limit women's access to key drivers of their climate resilience.

Increasingly, marketplace platforms are emerging that connect rural women with buyers they would otherwise not reach. By combining digital channels that overcome women's mobility constraints with in-person support designed to help women use digital platforms, these platforms provide new opportunities for women to improve their earnings, react to price volatility, and diversify into more climate-resilient crops.

Importantly, many marketplace platforms also connect smallholders with financing, inputs, post-harvest storage and transportation, helping to promote access to key drivers of their climate resilience.

In Kenya, 82 percent of the milk sold by women was sold at the farm gate to other farmers and traders (compared to 61 percent of milk sold by men). Women sold less than 15 percent of their milk to collection centers, traders, village markets, or other channels that required delivery outside their homes (compared to 39 percent of milk sold by men) (Njuki and Sanginga 2013).

In the drylands of Kenya, livestock traders offer women lower prices than men. They have the information and networks to monitor market prices in the region and are aware that women—due to their relative lack of contacts and information, limited mobility and access to mobile phones, and need for their husband's permission to sell livestock—have fewer market options than men (IUCN 2018).

Across 11 African cities, about 70 percent of households buy most of their food from informal daily food markets and street vendors, informal spaces where women are the primary vendors (WBG 2020).

Wi Agri

Wi Agri in Côte d'Ivoire provides a digital platform for small-scale producers and buyers in the cashew value chain. The platform provides **women cashew producers and laborers with a digital marketplace** to sell their cashews and access financial services like savings and credit, agricultural advice, financial education, and business management coaching. Among its core innovations is adapting service content and delivery methods to the specific needs and constraints of rural women (Chao-Beroff and Isern 2022).

Farm to Market Alliance

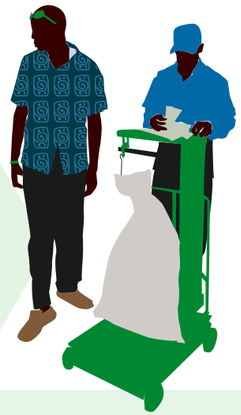
Farm to Market Alliance (FtMA) , which operates in Kenya, Rwanda, Tanzania, and Zambia, is a public-private sector Alliance of AGRA, Bayer, The Rabobank Group, Syngenta, World Food Programme, and Yara International. It works through a network of Farmer Service Centers (FSCs) to support smallholders and transform food value chains. FSCs are key service hubs that improve access to information, quality inputs and relevant services, affordable financing, handling, and storage solutions and **provide timely market connections, guiding producers' transition from subsistence to commercial farming**. FtMA is striving to ensure women and youth are specifically represented in the program; representation from these two groups increased by 9 percent in 2022 across FtMA's four countries of operation. Women working at FSCs have also increased and diversified their income. They earn commissions and income from providing and linking farmers to inputs and services they need, all with coaching from FtMA and Kuza (Mercy Corps AgriFin 2021).

AFEX

AFEX in Nigeria is a leading digital platform and commodities exchange working directly with smallholder farmers and organizations that serve them. Providing inputs, extension services, in-kind financing, storage, and warehouse financing, AFEX serves about 450,000 smallholders, 30 percent of whom are women. Female farmers play an important role in AFEX's scaling strategy. To better reach and serve them, AFEX captures customer insights from their extension workers and regional customer feedback groups. AFEX also **recruits experienced women farmers as extension workers, leveraging their networks and expertise** to bring more women onto the platform (Maftei et al. 2022).

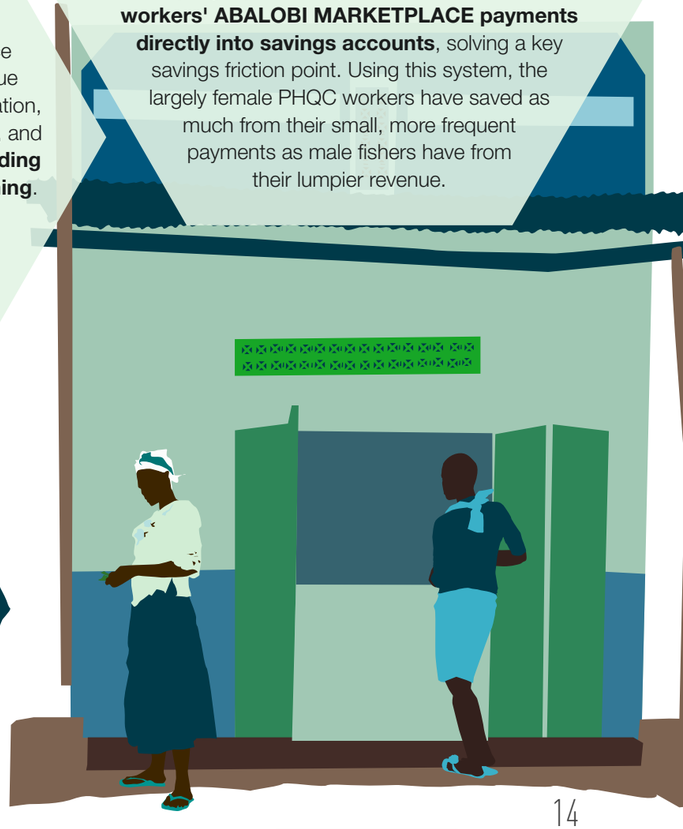
Community Markets for Conservation

Community Markets for Conservation (COMACO) in Zambia is a social enterprise of 112 cooperatives reaching 230,000 families across 89 chiefdoms that supports both wildlife conservation and small-scale agriculture. COMACO helps farmers transition from unsustainable farming practices to approaches that restore soil health and increase production. The COMACO **'It's Wild' brand converts producers' surplus production into value-added products**, distributing its revenues with the community to incentivize adoption of these farming practices.



ABALOBI

ABALOBI facilitates market access for small-scale fishers and post-harvest quality-control (PHQC) workers. Increasingly volatile climate, economic, and market conditions mean fishers and PHQC workers face fluctuating earnings and struggle to save for critical items such as boat maintenance, children's education, and emergencies. Working with CGAP, ABALOBI is piloting an **automated mechanism sweeping a percentage of fishers' and PHQC workers' ABALOBI MARKETPLACE payments directly into savings accounts**, solving a key savings friction point. Using this system, the largely female PHQC workers have saved as much from their small, more frequent payments as male fishers have from their lumpier revenue.



SECTION 3

WAY FORWARD

This overview of 10 opportunities to strengthen rural women's climate resilience and examples of financial and agricultural service providers at work in this frontier aims to guide providers toward serving rural women more effectively while generating value for their business.

To do this successfully, here are five key recommendations for service providers, based on CGAP and Mercy Corps AgriFin experience:

1. Recognize the diversity of rural women. Effective service providers identify which distinct profiles of rural women they want to serve, understand the climate-driven opportunities and risks facing these women, and tailor service to their specific needs (CGAP 2023).

To help service providers and funders achieve a deeper understanding of rural women's needs, CGAP has created personas that provide a nuanced segmentation of rural women's main profiles, experiences, behaviors and goals.

2. Bundle services. Combinations of financial and non-financial services can more effectively address rural women's unique challenges and opportunities. Bundling financial services with training and other types of support can help build women's capacity to effectively use and benefit from climate-smart services.

3. Address systemic barriers and social norms. In the short-term providers should design around barriers like limits on land ownership, lack of formal identification, and constraining gendered norms, while working with communities and within households, including men, to shift them over the longer-term (Beuchelt and Badstue 2013; Koning, Ledgerwood, and Singh 2021).

4. Leverage business model innovations. New technologies have spurred business model innovations that can help companies reach and serve rural customers. Agtech, fintech, and digital platform business models can be adapted and tailored to meet the unique needs of rural women and deliver climate-smart services at scale.

5. Work with partners across sectors. Effectively meeting rural women's needs requires expertise in agriculture, food systems, financial services, gender, climate change and digital technologies, making cross-sectoral partnerships critical.

Looking ahead, CGAP and MercyCorps AgriFin will be working in close collaboration with our members and partners to explore and distil best practices and replicable business models for service providers and other stakeholders to design and deliver services that add value to rural women's lives and livelihoods.

BACKGROUND

About CGAP

CGAP is a global partnership of over 30 leading development organizations, housed at the World Bank, that works to advance the lives of people living in poverty through inclusive finance. We believe that financial inclusion is an important enabler of green, resilient and inclusive development, particularly for poor, vulnerable and underserved segments, especially women.

CGAP works with key partners to build evidence and test effective solutions for rural women, including in the context of climate change. Better access to and use of responsible financial services can drive the use of climate-smart inputs, tools, and services. Despite the increasing promise of digital technologies to solve the most intractable problems, CGAP also recognizes the need to adapt digital solutions to the realities of rural women.

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About Mercy Corps AgriFin

Mercy Corps AgriFin envisions a future where every smallholder farmer prospers in a digitally interconnected world. It works with public and private sector partners to design, test and scale digitally enabled products and services for smallholder farmers (SHFs) to boost their productivity and income helping them Cope, Adapt and Thrive whilst building their resilience to climate change.

Mercy Corps' AgriFin Digital Farmer (ADF2) program works with carefully selected partners to reach five million smallholder farmers across Kenya, Tanzania, Ethiopia, Uganda, and Nigeria with high-impact bundles of digitally enabled products and services. With support from the Bill and Melinda Gates and Bayer Foundations, ADF2 seeks to expand digital ecosystems of diverse service providers supporting farmers to build their income, productivity, and resilience by 50 percent while reaching at least 40 percent women smallholders. ADF2 programming includes a core focus on building climate smart and gender transformational approaches in all our work.

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Featured Providers

ABALOBI
ACRE Africa
Africa Knowledge Zone
AFEX
AfriScout
AgroMall
Apollo Agriculture
APROMAC
BRAC International Microfinance
CARE
ColdHubs
Community Markets for Conservation (COMACO)
Copia
Crop Nutrition Laboratory Services (CropNuts)
DigiCow
Enviu
Equitel
Equity Bank
Farm to Feed
Farm to Market Alliance
Global Fund for Widows
Hello Tractor
HerVest
Inspira Farms
iShamba
KEIPhone
Kuza One
Learn.ink
Let It Rain
M-KOPA
Mediae
MiBank
Muktinath Bikas Bank Limited
myAgro
PEG Africa
Precision Development
R4 Rural Resilience Initiative,
Shamba Shape Up
Sistema.bio
SokoFresh
Sprout
Sterling Bank
SunCulture
TruTrade
USAID
VisionFund
Weather Index-based Risk Services
Wi-Agri
Women's Micro Bank Limited
Women's Weather Watch
World Relief
ZANACO

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CGAP Members