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The U.S. Government's Global Hunger & Food Security Initiative



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Digital Solutions Used by Agriculture Market System Actors in Response to COVID-19

RESULTS OF A RAPID ANALYSIS

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List of Acronyms

| | |
|---------------|--|
| AGRA | Alliance for a Green Revolution in Africa |
| ANACIM | National Agency of Civil Aviation and Meteorology |
| B2B | Business-to-business |
| B2C | Business-to-consumer |
| CDP | Cooperative Development Program |
| CRM | Customer relationship management |
| D4RFS | Digital for Resilience and Food Security |
| DFS | Digital financial services |
| DSP | Digital service provider |
| FTF | Feed the Future |
| IP | USAID implementing partner <i>(In this report, these are organizations implementing FTF activities in the focus countries of the study.)</i> |
| IVR | Interactive voice response |
| KYC | Know-Your-Customer |
| MFI | Microfinance institutions |
| NASFAM | National Farmers' Association of Malawi |
| PIATA | Partnership for Inclusive Agricultural Transformation in Africa |
| RFS | USAID Bureau of Resilience and Food Security |
| SACCO | Savings and Credit Cooperative Organization |
| SHF | Smallholder farmer |
| SME | Small and medium-size enterprises |
| SMS | Short message service |
| UNCDF | United Nations Capital Development Fund |
| USAID | United States Agency for International Development |
| USSD | Unstructured Supplementary Service Data |
| VSLA | Village Savings and Loan Association |
| WE | Women and e-Commerce Forum |
| WHO | World Health Organization |

Executive Summary

The World Health Organization (WHO) declared COVID-19 a global pandemic in March 2020.¹ Subsequently, a range of restrictions were put in place to control the spread of the virus. These included restrictions on travel within and across borders, marketplace and facility closures, limits on group gatherings, mask mandates, and curfews. As a result of these safety measures, agricultural markets across the globe experienced unprecedented disruption at every stage of the agriculture value chain, including pre-production, production, and post-production, which have had wide-ranging impacts on agriculture market actors, reducing their ability to access inputs, aggregate produce, and/or sell at markets. Women have been especially impacted due to an increase in additional unpaid household duties (e.g., homeschooling, caring for sick family members).



In response to such disruptions, digital transformation, defined by the United States Agency for International Development (USAID) as “the rapid development and adoption of digital technology [that] are transforming industries, governments, economies, and societies,”² is accelerating and driving the adoption of digital tools,³ services, and technologies. Within the agriculture market system, actors—from farmers and input providers to retailers and exporters—are also incorporating digital solutions into their daily operations. While digital transformation comes with the promise of positive outcomes, such as efficiency, cost savings, convenience, and increased safety of remote transactions, it also brings barriers and risks that could negatively affect the adoption of digital solutions, such as cyber threats, cyberbullying, fraud, or exclusion of marginalized populations that are unable to access and use these digital solutions.

This gap has created an opening for USAID and its implementing partners (IPs) to promote sustainable digital transformation processes that support agriculture transactions during the pandemic, and also contribute to agricultural market system resilience in the face of future shocks. In an effort to support market system actors as they navigate the challenges and opportunities associated with digital transformation in the age of COVID-19, USAID’s Bureau for Resilience and Food Security commissioned a rapid analysis to identify and analyze trends driving the adoption of digital tools in the agriculture market system in response to the global pandemic. The rapid analysis focused on three key objectives:

- Identify and analyze trends driving the adoption of digital tools in agriculture market systems in response to the global pandemic.
- Provide examples of such digital solutions across market system actors.
- Provide concrete and actionable recommendations for USAID Missions to ensure that digital tools can be used effectively to increase resilience in the face of future threats.

A research team of two consultants conducted the rapid analysis from mid-January to mid-March 2021. This process included a literature review and qualitative interviews with 66 stakeholders including USAID Missions’ Feed the Future teams, subject matter experts, implementing partners, private-sector service providers, and local agriculture market actors. The team focused the study on eight countries selected based on a representational

¹ World Health Organization, Press Briefing, March 11, 2020, <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>

² USAID’s Digital Strategy 2020–2024 <https://www.usaid.gov/usaaid-digital-strategy>

³ Digital tools are defined as applications of digital technologies to meet a specific human need. Digital tools differ from infrastructure in that they are geared toward a specific application, while infrastructure tends to be more general purpose (USAID Digital Strategy 2020–2024).

breadth of geographies and digital maturity: Bangladesh, Ghana, Guatemala, Kenya, Malawi, Nepal, Niger, and Senegal.

The team also conducted a webinar with key USAID Mission staff to present their findings and solicit feedback on which topics Missions would most value receiving further guidance on to effectively support digital transformation in agriculture market systems and increase resilience against pandemics or other threats.

Trends and Findings

Once the pandemic began, market actors had to adapt quickly, adopting a variety of digital tools and services to overcome various disruptions. The overall findings were:

1) Few new digital solutions launched in the countries covered by this assessment: The research team did not find many digital solutions developed specifically in response to the pandemic, except for a few newly launched e-commerce platforms.

2) Many digital service providers and agribusinesses accelerated, adapted, and increased their digital services: The team identified actors that accelerated and/or adapted their services. For example, agribusinesses that work with producers to buy and trade accelerated the launch and introduction of new functionalities on their business-to-business (B2B) platforms. Additionally, digital advisory service providers adapted their bulk short message services (SMS) to include new information on locations to purchase inputs or open marketplaces.

3) Most market actors increased their use of existing digital solutions and in some cases adopted them for the first time: There were market actors who, as a result of the pandemic, adopted existing tools and services, such as WhatsApp and digital payments, for the first time and/or increased their use of them.

The findings section of this analysis provides details on the digital tools and services that the research team identified, categorized into two sub-sections:

- New and/or adapted solutions: E-commerce online marketplaces, farmer management solutions, linkage services, and asset sharing services.
- Increased use of existing solutions: Digital communication tools, social media, traditional digital media, and digital payments.

Adoption

Many market actors organically adopted some digital tools while for others, adoption took place after IPs and their activity partners (e.g., producer groups) or service providers introduced them to the tools. The research team found that most market actors, including smallholder farmers (SHFs), input suppliers, producer groups, and service providers, used solutions that require a basic mobile phone, are relatively low cost, and are simple to use (e.g., voice calls, interactive voice response (IVR), bulk SMS, and radio).

Use Cases

In response to market disruptions, market actors used new, adapted, and existing digital solutions to change their operations. They created time and cost efficiencies by conducting transactions remotely and reduced travel time to physical locations such as markets. Also, market actors organized activities such as aggregation and transport remotely, and even found new customers, distribution channels, and marketplaces online. Most stakeholders engaged in this analysis believe that these use cases will endure after the pandemic because of the convenience

and ability to diversify sales, distribution channels and customers. Many interviewees also expressed a belief that COVID-19–related disruptions have provided momentum for pushing market actors to adopt and use digital tools and services, even in cases where a digital solution already existed but was met with slow adoption, such as mobile money.

Enablers

Some factors that enabled market actors to adapt or accelerate use of digital tools and services include access to infrastructure such as telecommunications and electricity, affordable service costs, such as low mobile money transaction fees, mobile devices (at minimum a basic mobile phone), and digital literacy. Market actors with access to these enablers were better prepared to use digital tools and services and therefore, able to seize opportunities and increase their resilience to the disruptions caused by the pandemic.

Recommendations

In the body of the report, the team provides practical actions that USAID Missions and IPs can take to support agriculture market actors during the continued disruptions caused by the COVID-19 pandemic, and build resilience for future disruptions. Based on the research and analysis of these findings, the research team proposes the following recommendations.

Where appropriate, USAID should:

1. **Ensure target producer groups and relevant market actors take full advantage of the significant increase in e-commerce marketplaces as a new sales channel for agricultural products and substitute, in part, for in-person marketplaces.** Market actors will benefit from using multiple distribution channels to access new and existing customers for produce and inputs, and increase efficiencies through remote transactions. USAID and IPs could conduct a market assessment of e-commerce platforms that are available in their country of operation and ensure producers have the knowledge and digital capabilities to use them, while supporting digital service providers with technical and/or business advice and market research to onboard new producers and agribusinesses to their marketplaces.
2. **Support market actors to fully leverage available digital communications tools and social media (e.g., WhatsApp, Facebook, Twitter, LinkedIn) that have replaced much of the traditional in-person negotiations and transactions at all stages of the agriculture market system during the pandemic.** Market actors will benefit from access to valuable information for making market decisions, the ability to facilitate communications among market actors, increased efficiencies and convenience gained through conducting remote transactions, and increased income through expansion of their customer base and marketing channels. USAID and IPs could assess availability and current use of such platforms, devising strategies and approaches to train users in how to adopt and use them while mitigating any inherent risks such as cyber bullying, fraud, and misinformation.
3. **Encourage the use of digital farmer management solutions among farmer groups and outgrower schemes.** At their core, these solutions have a database of information on individual farmers or households. Market actors using such solutions can quickly collect and disseminate information that is critical for making decisions on how to conduct transactions, and can help efficiently aggregate demand and supply of produce and inputs to potentially secure better pricing. USAID and IPs

can share learnings from existing solutions, outline the costs and benefits of operating these solutions based on sustainable business plans, evaluate provider options (e.g., outsourcing or licensing existing solutions versus developing them; contracting global service providers versus local ones), and support partners in conducting activities to pilot and scale solutions.

4. **Encourage the use of digitally enabled shared services across the agriculture market system that enable actors to procure mechanization and asset rental services.** SHFs will benefit from the ability to conveniently procure mechanization services for uses such as preparing land, planting and harvesting in a timely manner and at affordable rates, and gaining efficiencies in production. Also, service providers will be able to scale and expand their range of offerings through increasing demand. USAID and IPs can facilitate market research to assess supply and demand for shared mechanization services, knowledge sharing events among market actors, and linkages between agriculture partners and service providers.
5. **Assess the landscape of digital agriculture tools and services able to support market actors in leveraging innovative digital services that are emerging and/or adapting in response to COVID-19.** Benefits to market actors include increased awareness of the range of services and service providers in the market that can support their agriculture activities, helping them to diversify sales channels, access inputs at better prices, and improve information asymmetry. USAID and IPs can conduct regular market assessments for digital tools and services and service providers operating in the market. Also, IPs could conduct needs assessments with partners and facilitate information-sharing events and linkages among relevant market actors.
6. **Continue work to sustain and increase use of digital financial services (DFS), including digital payments, which are essential to facilitate safe remote transactions.** Expanding access to and use of DFS can enable market actors to use financial tools that are convenient and affordable, enable investment in agriculture market activities and efficient transactions, and build the resilience needed to cope with disruptions like COVID-19. USAID and IPs can leverage the guidance already developed by USAID on the use of DFS to finance and ensure agriculture practices, and incorporate digital payments across agriculture value chains.⁴ IPs can assess key barriers and enablers with their agriculture partners and identify relevant providers and initiatives that promote DFS and create relevant linkages between the DFS providers and agriculture market actors.
7. **Support creative solutions to get affordable mobile phones (basic feature phones, at a minimum) into the hands of market actors.** Market actors would benefit from mobile phones that enable them to efficiently and conveniently access vital market information, conduct agriculture transactions including buying and selling produce and inputs, and access a range of valuable services throughout production and across the value chain. USAID and IPs can identify creative approaches, learning from initiatives that have been implemented elsewhere to help actors procure basic phones. IPs can also conduct user research and/or leverage existing research to identify barriers to phone ownership and use, and incorporate strategies to address them.
8. **Ensure risks are mitigated across all digital tools and services during the pandemic and beyond.** Market actors would benefit from knowing the potential risks of using digital tools and services

⁴ USAID and mSTAR, Digital Financial Services for Agriculture Guide, June 20, 2018, <https://www.usaid.gov/digitalag/documents/digital-financial-services-agriculture-guide>

(e.g., cyberbullying, fraud, misinformation), learning how to mitigate these risks and understanding what avenues exist to manage them. USAID and IPs could conduct assessments of existing regulations and policies that pertain to digital technology and consumer protection in their respective countries, as well as identify relevant advocacy groups or entities engaged in issues around digital skills education. IPs could collaborate with their local agriculture market system activity partners to develop appropriate training curriculums and conduct training for users.

I. Introduction and Objectives

The COVID-19 pandemic has caused unprecedented disruption to the lives of agriculture market system actors around the globe, albeit to varying degrees in each country.



Before the pandemic began, digital transformation, defined in USAID's Digital Strategy as “the rapid development and adoption of digital technology [that] are transforming industries, governments, economies, and societies,”⁵ was already underway in emerging economies and in their agriculture sectors. Since the onset of the pandemic, market actors have adopted, adapted, and accelerated their use of a range of digital tools and services to respond to disruptions and continue conducting market transactions at all stages of the value chain.

This creates an opportunity for USAID and its IPs to support sustainable digital transformation through adopting digital tools and services that are affordable and sustainable, and contribute to agriculture market system resilience by increasing efficiency, adaptability, and competitiveness of individual actors, while addressing barriers and mitigating potential risks.

USAID's Bureau of Resilience and Food Security (RFS) initiated this activity to support market system actors as they navigate the challenges and opportunities associated with digital transformation in the era of COVID-19. The study encompassed three key objectives:

- Identify and analyze trends driving the adoption of digital tools in agriculture market systems in response to the global pandemic.
- Provide examples of such digital solutions across market system actors.
- Provide concrete and actionable recommendations to guide USAID Missions to ensure that digital tools could be used effectively to increase resilience in the face of future threats.

The research team focused on trends in eight countries, facilitated a webinar for key USAID Missions, and created guidance documents to support efforts to promote viable digital transformation in agriculture market systems.

⁵ Digital Strategy 2020–2024, USAID, <https://www.usaid.gov/usaid-digital-strategy>

2. Approach

The Digital for Resilience and Food Security (D4RFS) initiative, through the Digital Frontiers project, engaged a two-person team of consultants to implement this activity. In collaboration with USAID, the research team selected eight focus countries for the study based on a representational breadth of geographies and digital maturity: Bangladesh, Ghana, Guatemala, Kenya, Malawi, Nepal, Niger, and Senegal. The team also incorporated learnings and examples beyond these countries through a literature review.



The scope of the activity was divided into two major tasks, described below.

2.1 RAPID ANALYSIS

The consulting team conducted a literature review and 66 qualitative interviews⁶ with stakeholders from a range of countries, roles, and backgrounds, including:

- Eight USAID Mission teams including Feed the Future (FTF) teams
- 12 sector experts across USAID
- 20 key implementing partners designated by the FTF teams
- Three international development or government programs working in the sector
- 14 private-sector service providers (e.g., digital services providers, financial service providers)
- Nine local agriculture market actors (e.g., input providers, marketplace operators, farmer groups)

See [Annex 1](#) for a list of stakeholders interviewed, [Annex 2](#) for the interview guides, and [Annex 3](#) for a select number of key resources consulted.

The study aimed to answer the following questions:

- What were the major disruptions caused by the pandemic to actors across the agriculture market system and what challenges are shared or unique to specific groups of actors?
- How did the use of existing digital tools and services change to address these disruptions (e.g., how were they adapted, how did usage change)?
- Were new digital tools/services introduced due to COVID-19?
- What are the priority tools, skills, and capabilities that agriculture market actors are seeking or willing to adopt as part of their COVID-19 response? Do they intend to continue using these tools as recovery efforts progress?
- What are the emerging trends in digital transformation of most relevance to agriculture market system actors in the face of COVID-19 (e.g., e-payments, digital financial services, procurement, e-commerce)?
- What, if any, locally led digital tools or services have emerged and been adopted by agriculture market actors?
- What are the most pressing technical assistance needs market system actors have as they transition to digital ways of working?
- How can USAID and its partners assist in helping these actors acquire these needed technical skills and capabilities?

⁶ Interviews typically involved 1–4 participants, including the Mission interviews, which varied and ranged by team, including Feed the Future team members, economic growth officers, and/or economists. Some stakeholders fall into more than one category (e.g., a producer and trader who also runs an online marketplace) but are counted only once.

Limitations and Considerations

The primary goal of this work is to generate ideas and guidance to help USAID Missions and IPs identify opportunities that can be leveraged for programming in the near future to support market actors' resilience in managing shocks and disruptions, such as those brought on by COVID-19.

This type of rapid analysis has limitations. Given the ongoing nature of the pandemic, market disruptions and their related impacts on market system actors continue to evolve. As such, this research was not intended to be a deep or extensive study, but rather a high-level scoping to quickly understand various contexts and identify opportunities for USAID Missions and IPs to pursue. This study uses a rapid literature review and findings from a relatively small group of stakeholder experiences to provide a snapshot of how market system actors are using digital tools and services to respond to the pandemic.

The primary focus of this study was understanding how COVID-19 disrupted market transactions, including production, pre-production sourcing of inputs, and post-production marketing and sales. Although digital tools and services were used extensively for advisory and extension services to support farmer planning and production (e.g., weather, crop calendars, and agronomic techniques), these categories of digital solutions were not included in this scope of work.

2.2 LEARNING AND DISSEMINATION OF TOOLS

Based on the analysis and findings from the study, the research team facilitated a webinar to present findings and recommendations to RFS and priority USAID Missions to elicit their input on the type of guidance that would be most valuable for their work. Based on their feedback, the research team then created guidance documents for USAID Missions and IPs on how they could support the adoption and use of digital tools and services by agriculture market actors in response to COVID-19 and beyond. The final guidance documents are attached as Annexes and cover:

- [E-commerce Marketplaces](#)
- [Farmer Management Solutions](#)
- [Expanding Mobile Phone Access and Ownership](#)

3. Findings

The following section focuses on the learnings captured from the stakeholder interviews across the eight focus countries, supplemented by findings from the literature review. This analysis must be viewed as a snapshot into the experiences of a range of agriculture market actors in their adoption and use of digital tools and services in response to market disruptions caused by COVID-19. The findings in this section are organized as follows:



3.1 Disruptions to agriculture market systems caused by COVID-19

3.2 Digital tools and services used in response to COVID-19

- New and adapted solutions
- Increased adoption and use of existing solutions

3.3 Expected endurance of digital tools and services post-COVID-19

3.4 Enablers and challenges to digital adoption and use in response to COVID-19

3.1 DISRUPTIONS TO AGRICULTURE MARKET SYSTEMS CAUSED BY COVID-19

In response to the pandemic, governments around the world put in place policy restrictions as safety precautions to contain the spread of COVID-19, and these appeared to be most strict in the first months following the declaration of the pandemic in March 2020. Some of these mandates, such as restrictions on travel within countries and across borders, complete border closures, marketplace and facility closures, limits on group gathering sizes, mask mandates, and curfews, caused varying degrees of disruption to agriculture market systems in all countries. While many policy restrictions, such as facility closures, hindered market activities, some governments declared agriculture services as essential. Policies in other countries also affected agricultural markets when neighboring countries closed their borders.⁷ Finally, some market system actors applied self-imposed restrictions, fearful of returning to marketplaces or group settings.

Restrictions disrupted every stage of the agriculture value chain. For example, restrictions reduced the availability of input supplies, which led to fluctuating prices, limited access to hired labor or transportation, impeded opportunities to aggregate producers' outputs, and, in some cases, even limited access to financing when banks froze lending in the face of unpredictable economies. These market disruptions in turn have had far-reaching negative impacts on market actors who may have had post-harvest crop losses, paid more for inputs, lost customers and income, and/or lost access to credit. Further, the negative impacts on women have been disproportionate due to existing gender inequalities. Women have experienced an increase in unpaid household work through activities such as homeschooling or caring for sick family members, a loss of income that is often used for household expenditures, and exposure to increasing domestic violence.^{8,9} These negative repercussions

7 This is not a comprehensive list of which countries deemed agriculture activities to be essential or not during the pandemic, but it illustrates a few examples; Kenya and Malawi deemed agriculture activities as essential; in South Africa and Zimbabwe, small-scale farmers were not regarded as essential services; in Indonesia and Mozambique, small-scale farmers were deemed essential. For more information, see this impact survey: <https://www.weltohone hunger.org/full-article/small-scale-farmers-responses-to-covid-19-related-restrictions.html>

8 A. Koning, et al., 'Women in Rural and Agriculture Livelihoods Facing COVID-19', CGAP Blog, July 27, 2020, <https://www.cgap.org/blog/women-rural-and-agricultural-livelihoods-facing-covid-19>

9 C. Salcedo-La Vina, et al., "'Rural Women Must Be at the Heart of COVID-19 Response and Recovery,'" World Resources Institute Blog, September 21, 2020, <https://www.wri.org/blog/2020/09/rural-women-must-be-heart-covid-19-response-and-recovery>

not only affected current agriculture activities but also may have extended consequences on the viability of agriculture activities, food security, and poverty levels if market actors are unable to recover their losses. Disruptions and related impacts are summarized in Table I.

Table I: Disruptions and Impact on Agriculture Market Actors

| Agriculture Value Chain Phase | Key disruptions | Key impacts on actors |
|--------------------------------------|--|---|
| Planning | <ul style="list-style-type: none"> Reduced dissemination of technical advice, and collection of SHF information | <ul style="list-style-type: none"> Loss of access to guidance from technical experts and peer support |
| Inputs | <ul style="list-style-type: none"> Increased cash flow constraints, decreased liquidity, and diminished access to finance (financial service providers risk averse) Decreased input supplies (imports and domestic) Increased prices Shifts in market demand for products led to demand for different inputs Closure of shops including agri-businesses | <ul style="list-style-type: none"> Inability to purchase inputs, inability to pay for logistics Slowed, halted, diminished quality of SHF production Loss of income and liquidity for input dealers Rapid shifting required of resources, inputs, products, customer, markets |
| On-farm production | <ul style="list-style-type: none"> Decreased extension services Increased household duties for women SHFs Reduced farm labor Inaccessible equipment rentals | <ul style="list-style-type: none"> Inability to resolve pest problems, access agrovet, implement new processes, meet with extension agents Decreased agriculture activities supplanted by additional unpaid domestic work (e.g., oversee homeschool, care for sick family) Inability to hire adequate labor or machinery for harvest, planting, processing leading to crop wastage and/or seed consumption |
| Post-harvest: storage | <ul style="list-style-type: none"> Reduced access to warehousing Closing of warehouses | <ul style="list-style-type: none"> Inability to access and use storage resulting in crop wastage and reduced aggregation Loss of income by warehouse actors |
| Post-harvest: processing | <ul style="list-style-type: none"> Reduced access to processing equipment | <ul style="list-style-type: none"> Inability to process product, resulting in crop wastage Loss of income by processors |
| Post-harvest: transport | <ul style="list-style-type: none"> Decreased transportation services | <ul style="list-style-type: none"> Inability to access markets, warehouses, or inputs Increase in resources to arrange transportation Loss of income by transporters |
| Access to markets | <ul style="list-style-type: none"> Decreased local and overseas markets Shifts in product demand Reduced aggregation | <ul style="list-style-type: none"> Increased crop wastage Strained customer/buyer relationships Decreased negotiation power of SHFs Increased stress and pressure to rapidly adapt (e.g., local staples increased, export commodities decreased like fresh flowers) |
| Cross-cutting | <ul style="list-style-type: none"> Reduced access to financial institutions (physical branches) Reduced access to credit when financial service providers froze lending | <ul style="list-style-type: none"> Inability to access cash (liquidity), credit Inability to access savings at physical branches |

Various surveys carried out during the year by different organizations illustrate the ways in which SHFs, and in particular women, have been impacted, and some of those key findings are described below.

Findings from impact surveys

Since the beginning of the pandemic, 60decibels has surveyed over 25,000 people in 19 countries about how COVID-19 has affected their lives.¹⁰ As a sub-set, they surveyed 4,100 farmers in Kenya from June to December 2020 on their farm adjustments, coping strategies, and use of digital tools.¹¹ The data illustrate many challenges faced by farmers, including the following key findings:

- 87 percent used financial coping strategies (64 percent used savings and 52 percent sold an asset or borrowed money).
- 69 percent reported paying higher prices for inputs and 63 percent reported receiving lower prices on their produce in the previous two weeks (even though food prices in general increased, that increase has not benefited the farmer).
- 28 percent adjusted key farming activities, including selling less crops and livestock (58 percent), buying fewer inputs (53 percent), harvesting less (45 percent), and not hiring as much labor (56 percent).
- 15 percent reported consuming less food in their households, and 31 percent consumed smaller portion sizes.

The Centre for Rural Development also carried out a survey on the impact on small-scale farmers in terms of food security, challenges of farming and marketing, and coping strategies. They surveyed a combination of 700 peri-urban, urban, and rural farmers across Indonesia, Mozambique, South Africa, and Zimbabwe between April and June 2020¹² and their main findings were as follows:

- The severity of national restrictions correlated with the severity of impacts on farmers related to food shortages and price spikes.
- Farmers adapted to selling their products to other customers, substituting local communities for restaurants; some urban farmers even established neighborhood-wide WhatsApp marketing groups.
- Farmers growing a diversity of crops fared better than those dependent on one crop.
- Urban poor lost income as day laborers and their access to food was restricted due to market closures.
- Mobile phones and communication applications (e.g., WhatsApp) were important to link farmers with consumers and new markets, yet the cost of data and smartphones hindered many farmers from being able to sell products digitally.

In another survey, Partnering for Innovation surveyed 44 agribusinesses across 19 countries from May to October 2020.¹³ Though businesses expressed their need for cash flow injections to support their recovery, some were beginning to overcome the initial downturn:

- 52 percent of the agribusinesses reported that production levels in October were similar to or greater than in May.
- 7 out of 10 were still experiencing a drop in sales in October, compared to 9 out of 10 in May.
- 68 percent of initial lay-offs had been rehired by October.

10 60_decibels, Listening in the time of COVID-19, 60_decibels website (accessed March 2021), <https://app.60decibels.com/covid-19>

11 60_decibels, How are Kenyan Farmers Faring in the Face of COVID-19?, 60_decibels website (accessed March 2021) <https://app.60decibels.com/covid-19/agriculture>

12 S. Stober, et al., Small-scale farmers responses to COVID-19 related restrictions, Rural 21, February 28, 2021, https://www.rural21.com/english/a-closer-look-at/detail/article/small-scale-farmers-responses-to-covid-19-related-restrictions.html?no_cache=1, and <https://www.weltohnehunger.org/full-article/small-scale-farmers-responses-to-covid-19-related-restrictions.html>

13 Partnering for Innovation, Road to Recovery: Key Findings from Follow-up COVID-19 Partner Survey, <https://www.partneringforinnovation.org/follow-up-covid-19-partner-survey-key-findings> (accessed March 2021),

USAID's Cooperative Development Program (CDP) conducted a study on the impact of the pandemic on 89 agricultural cooperatives across eight countries¹⁴ from May through July 2020.¹⁵ Based on their findings regarding the impact on production, marketing, and sales of agricultural commodities as well as household economics, CDP identified the greatest needs for support as expressed by the cooperatives in their response to COVID-19 disruptions:

- 50 percent of respondents said access to finance to cover losses.
- 36 percent of respondents said coaching to shift business strategies and operations.
- 33 percent of respondents said access to technology to maintain business operations.

To understand the disproportionate impact on women, ActionAid conducted a survey of 190 individuals across 14 countries in Asia and Africa.¹⁶ It revealed specific findings related to the impact of the pandemic on women:

- 60 percent of respondents confirmed women's household chores had increased.
- 50 percent of respondents were affected by reduced market hours and imposed vendor rotations.
- 58 percent of smallholder women farmers confirmed that parents, especially women, had to skip meals during lockdown periods.
- 52 percent of respondents reported an increase in gender-based violence in their community.

This cross-section of surveys demonstrates how the pandemic has negatively affected the agricultural sector in emerging economies. The section below describes how agriculture market actors have used digital tools and services to cope with these challenges in conducting their agriculture transactions.

¹⁴ Bangladesh, Ghana, Guatemala, Kenya, Malawi, Nepal, Niger, and Senegal.

¹⁵ Cooperative Development Program, Impact of COVID-19 on Agricultural Cooperatives, accessed April 2021, <https://www.usaid.gov/sites/default/files/documents/CDP-COVID-19-Impact-Study.pdf>

¹⁶ ActionAid, Covid-19 Food Crisis, Monitoring Research, Qualitative research, September 2020, <https://actionaid.org/publications/2020/covid-19-food-crisis-monitoring-research>

3.2 DIGITAL TOOLS AND SERVICES USED IN RESPONSE TO COVID-19

The pandemic arrived abruptly, forcing market actors to quickly adapt in order to avoid financial loss. The research team did not find many digital agriculture solutions that were newly created specifically to respond to the pandemic. However, the team did identify several market actors that accelerated their digital solutions (for example, see [Text Box 6](#)), and/or adapted their services in response to market disruptions (e.g., iShamba adapted their bulk SMS informational services from agriculture advisory to information on the location of inputs and open marketplaces). There were also market actors who adopted existing tools and services for the first time and/or increased usage to conduct market transactions (e.g., WhatsApp and digital payments). Further, USAID implementing partners introduced or ramped up the use of digital solutions in their programs to support their agriculture market system activity partners and participants, while in other cases agriculture market actors including agribusinesses and SHFs adopted and used digital tools and services on their own initiative.

“In Niger, COVID-19 has been a catalyst to our digital agenda. Much of the resistance we perceived has disappeared and the whole ecosystem has moved outside of its comfort zone. We had groundwork done by partners introducing digital solutions – whether on financial inclusion or agriculture -- and support programs targeting the most vulnerable population in rural areas which accelerated because of COVID-19. In this case, we had service providers approach farmers and then producer groups like cooperatives to offer them services. We have incubators and the entrepreneurs who have been very active, including leveraging youth that already had a vibe on technology. We tried to focus on key sectors in the peak of the pandemic – health but also the informal economy, small businesses, farmers, and the whole value chain of production.” - **Representative, National Agency for the Information Society in Niger**

The primary focus of this study was understanding how digital tools and services are supporting transactions across the market system —e.g., buying inputs, selling products, and engaging in intermediate services. This study did not focus on the use of digital solutions for training or advisory and extension services related to planning and production,¹⁷ though many market actors reported an uptick in digital solutions for these purposes, including a range of online digital communication platforms (e.g., phone, SMS, digital messaging platforms), video conferencing platforms (e.g., Zoom, Google Meet, Skype) and social media (e.g., Facebook and YouTube).¹⁸

Table 2 illustrates the digital solutions identified in this rapid analysis that are addressing challenges across the market system—from planning and production, to post-harvest activities such as storage, transport, processing, and linkages to customers and markets. Most of these digital tools and services are relevant in normal development contexts; however, this table represents those that were identified specifically in response to COVID-19 market disruptions. Some solutions, such as digital payments, were probably used across all stages of the agriculture system, but the research did not reveal that particular use case. Specific country case examples are interspersed throughout this report in text boxes that illustrate how digital tools and services were used in the eight focus countries.

17 For information regarding how COVID-19 affected extension and advisory services, see Davis, Kristin, Extension and Advisory Services Role in the COVID-19 Crisis, May 7, 2020, <https://www.agrilinks.org/post/extension-and-advisory-services-role-covid-19-crisis>; Bunnell, Dena, Adapting in the Field: Delivery Extension and Input Packages During COVID-19, September 20, 2020 <https://www.agrilinks.org/post/adapting-field-delivering-extension-and-input-packages-during-covid-19>; and Advisory services to potato farmer cooperatives via Skype, July 20, 2020, <https://www.agriterra.org/advisory-services-via-skype/>

18 Merriam Webster dictionary defines social media as: forms of electronic communication (such as websites for social networking and microblogging) through which users create online communities to share information, ideas, personal messages, and other content (such as videos). The research team considers YouTube social media in this study because it enables interactions by users to reply, comment, and share videos for education, marketing, and entertainment. It also fostered interaction, discussion, and community, <https://www.merriam-webster.com/dictionary/social%20media>

Table 2. Common digital tools and solutions used by actors during COVID-19

| Common digital tools and solutions used by actors during COVID-19 | Planning | Inputs | On-Farm Production | Post-Harvest: Storage | Post-Harvest: Processing | Post-Harvest: Transport | Access to Markets |
|---|----------|--------|--------------------|-----------------------|--------------------------|-------------------------|-------------------|
| Digital communications tools (WhatsApp) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Digital financial services (DFS) (payments, credit, savings, insurance) | ✓ | ✓ | ✓ | | | | ✓ |
| e-commerce, digital marketplaces, digital procurement | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Interactive voice response (IVR)/ outbound (push) and inbound calls | ✓ | ✓ | ✓ | | | | ✓ |
| Producer group management solutions ¹⁹ | ✓ | ✓ | ✓ | | | | ✓ |
| Radio | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SMS platforms (bulk messaging for dissemination, two-way messaging) | ✓ | ✓ | ✓ | | | | ✓ |
| Social media (Facebook, Twitter) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Video | ✓ | | ✓ | | | | |
| Video conferencing (Skype, Google Meet, Zoom) | ✓ | | ✓ | | | | |
| Virtual call center (Q&A hotlines with menu options or with callbacks) | ✓ | | ✓ | ✓ | ✓ | | |

Many of the tools and solutions, provided in Table 2 above, incorporate the use of a variety of technical approaches such as data analytics, artificial intelligence, chatbots, and geodata.

The following sections describe the most common digital tools and services that were identified throughout the research based on examples described by interviewees. These digital solutions were used either for the first time or increasingly by agriculture market actors to facilitate market transactions.²⁰ The digital solutions are divided into two general categories: new and adapted solutions or existing solutions that market actors increasingly used. These are further sub-categorized by type of service. Some digital solutions include multiple functionalities but are categorized in the section below based on their primary function (e.g., e-commerce platforms may incorporate digital payments and digital messaging). The sections below describe how each solution category addressed disruptions in the market, how they are being delivered, and which market actors used them to overcome relevant market disruptions.

¹⁹ Producer group management solutions are defined in section 3.2.1.3.

²⁰ Respondents at Farmers World in Malawi explained that they used videos shared on WhatsApp for farmer training but did not adopt any digital solutions for transactions.

3.2.1 New and adapted solutions

E-commerce marketplaces,²¹ match-making/linkage services, farmer management solutions, and asset sharing services are four types of digital solutions that existed before the pandemic. Based on the team's research, some of these solutions were adapted to pandemic disruptions and some experienced dramatic growth. The team also identified a few instances where digital solution rollouts were accelerated due to the pandemic (e.g., the farmer management solution, AgriConecta, see [Text Box 6](#)), and three online marketplaces that were created in response to the pandemic (e.g., [Goshen Farm Exporters Fruitee Kenya](#), a [cattle selling application in Bangladesh](#), and [OBNET](#) in Ghana).

3.2.1.1 E-commerce marketplaces

E-commerce marketplaces²² proliferated in response to COVID-related market disruptions. Though this innovation was not necessarily new in the markets studied in this analysis, once the pandemic began, new e-commerce marketplaces launched or expanded, and new users (customers and producers) joined the platforms. The team identified specific examples of e-commerce marketplaces that launched or adapted their offerings in four of the eight focus countries.²³ However, some e-commerce marketplaces expanded their businesses in all focus countries in response to COVID-19.²⁴ Some of these e-commerce marketplaces launched because vendors lost certain customer segments (e.g., retail shops, restaurants, and tourism resorts that closed) and felt compelled to seek out new customers—essentially expanding their operations from just business-to-business (B2B) sales to direct business-to-consumer (B2C) sales. This was propelled by new customer segments, such as the urban wealthy and middle-class who, while on lockdown and/or with local market closures, increased their demand for online shopping and home delivery.

A recent study shows that e-commerce marketplaces are part of a growing global trend.²⁵ They are emerging as a new and important marketing channel, boosted by pandemic restrictions. The study points out that African e-commerce marketplaces are advancing slower than those in other regions. The slower pace is due in part to higher transaction costs, which are in part a result of the high cost of logistics caused by issues such as poor roads and weak transport services. Despite these challenges, e-commerce marketplaces are growing and the study team found a number of emerging marketplaces that specialize in fresh and processed foods. For example, Goshen Farm Exporters in Kenya (see [Text Box 1](#)) launched a new online marketplace to sell processed fruit snacks directly to consumers to overcome shop closures due to COVID-19. In Senegal, Club Tiossane expanded its services to deliver a wide range of groceries in addition to its niche dairy products. Bangladesh experienced a growth in e-commerce marketplaces,²⁶ and in one example three women entrepreneurs established their respective e-commerce marketplaces to sell fresh, local fish (see [Text Box 9](#)). In another example, USAID's

21 Terminology of online e-commerce marketplaces described here: https://en.wikipedia.org/wiki/Online_marketplace

22 E-commerce marketplaces are digital marketplaces where buyers can buy a wide variety of products across vendors, pay for them together, and usually have them delivered. Amazon and Alibaba are two global examples of e-commerce marketplaces. For a thorough discussion of e-commerce marketplaces as one type of digitally enabled agricultural platform, see https://isfadvisors.org/wp-content/uploads/2021/03/ISF_RAFLA_Agricultural_Platforms_Report.pdf

23 These four countries were Bangladesh, Kenya, Nepal, and Senegal. Examples of smaller, more specialty (e.g., just for food) marketplaces that were launched or adapted in these countries include Obnets.com in Ghana, Goshen Farm Exporters Fruitee in Kenya, Foodmandu in Nepal, and Club Tiossane in Senegal, all which specialize in produce or food products.

24 Examples of e-commerce marketplaces that expanded in the focus countries include Jumia (in seven countries in sub-Saharan Africa, including Kenya and Senegal); Awalebiz (Senegal); Copia (Kenya); Twiga (Kenya); and Mercado Libre (Guatemala). The team found that e-commerce marketplaces do exist in Malawi and Niger but these countries lagged behind the other focus countries. For example, in Malawi, much of the e-commerce marketplace activity seemed to be classified listings: African Marketplace Explorer, UN International Trade Centre, <https://ecomconnect.org/page/african-marketplace-explorer>. While in Niger, one e-commerce marketplace for selling cattle (and many other products) was identified: Kaomini <https://www.kaomini.ne>.

25 T. Reardon, et al., E-commerce's fast-tracking diffusion and adaptation in developing countries, *Applied Economics Perspectives and Policy*, March 2, 2021 <https://onlinelibrary.wiley.com/doi/10.1002/aepp.13160>

26 Sahoo, Samveet et al., A Boon for Online Commerce: How COVID-19 is Transforming the Industry in Bangladesh, Next billion.net, undated, <https://nextbillion.net/online-commerce-covid19-industry-bangladesh/>

ADVANCE II program in Ghana supported its producer group partner to respond to COVID-related market disruptions by launching a B2B marketplace for agriculture inputs, produce, and services.²⁷

Text Box 1. Goshen Farm Exporters Limited



Goshen Farm Exporters Limited (GFE) is a family business launched in Kenya in 2010. It grows, processes, and exports horticulture produce by sourcing fruit from 1,200 farmers and processing it into snacks. When COVID-19 disrupted markets, Goshen Farm Exporters lost sales as domestic retail shops closed and exports declined because customers felt it was too risky to take on more stock in unpredictable times. Having worked with USAID's Kenya Crops and Dairy Market Systems program for two years to build marketing capacity, Goshen Farm Exporters was prepared to rapidly develop and launch its own Fruitee Kenya online shop, in addition to selling its Fruitee brand on the e-commerce marketplace Jumia.

To maintain engagement with its producers during the pandemic, Goshen Farm Exporters increased its use of [Safaricom's DigiFarm](#), a platform that provides SHFs with convenient access to services, including discounted inputs, financing, and advice on best farming practices through mobile phone. The platform enables SHFs to use SMS channels to communicate with collection officers and minimize physical interaction. SHFs also started using WhatsApp to send photos of their produce to Goshen Farm Exporters. Though WhatsApp requires smartphones or smart features phones that enable applications and user capability (e.g., ability to manipulate mobile applications), during the peak of the pandemic, many younger family members returned to their rural homes where they helped family members learn how to use the platform. Goshen Farm Exporters is also paying farmers directly into their mobile wallets. Online platforms (Facebook, Twitter, Instagram, and LinkedIn) have also proven essential for Goshen Farm Exporters to continue marketing to overseas customers (import distributors).

A representative from Goshen Farm Exporters' thinks these digital solutions will endure—at minimum the continued use of digital communications to interact with SHFs—because of the efficiencies the organization has realized by operating with fewer technical advisors traveling into the field. Also, a new segment of customers is finding that they can shop for snacks right from their couches. Digital services in the Kenyan market are advanced, and Goshen Farm Exporters is using these services to succeed in its business despite the pandemic.

In an additional example of adaptation, Foodmandu in Nepal is an e-commerce marketplace that had delivered takeout restaurant meals before COVID-19, and adapted to sudden restaurant closures by launching a related service, [Foodmandu Fresh](#), to deliver fresh produce to households. [Sastodeal](#), a Nepali e-commerce marketplace selling everything from clothes to electronics, also added fresh produce as a product to deliver to consumers. These adaptations meant the marketplaces had to find ways to buy, transport, and package produce efficiently. Some e-commerce providers turned to companies that already had connections with farmers, such as [KHETI](#) (see [Text Box 2](#)), for sourcing produce to meet demand, and relied on KHETI as an intermediary between producers and their e-commerce marketplaces.

27 OBNET (www.obnets.com)

Text Box 2. KHETI

DV Excellus' KHETI digital agriculture services in Nepal range from selling quality inputs to farmers to selling farmers' produce to consumers through KhetiFood. The KHETI service also offers agronomic advice to farmers who can use their smartphone application to manage their farms. It also handles the packaging and grading of produce sold. It works with 10,000 farmers in 11 districts with plans to expand to more districts and farmers after the pandemic.



When DV Excellus launched the KHETI service, it focused on a B2B model that targeted hotels and restaurants. It switched its focus to a B2C model when most hotel and restaurant businesses closed due to the pandemic. As of March 2021, Kheti supplied over 3,000 consumers.

During the peak of the pandemic lockdown, KHETI also sold produce on a B2B basis. Its B2B customers were not hotels and restaurants, however, but various e-commerce platforms such as Foodmandu, Payless, and Sastodeal. Due to lower demand from these marketplaces and the high margins demanded from such platforms, KHETI eventually stopped supplying them. The service has recently partnered with a new e-commerce platform, groDeli, and is also selling from its own platform. After the pandemic, KHETI will return to focusing on B2B service with its own business customers, but will continue with B2C as well. KHETI will also continue its work with USAID's Feed the Future KISAN II activity to link farmers and input suppliers, and strengthen their capacity for post-harvest management, to increase storage and expand their customer base.

One interviewee in Bangladesh reported that e-commerce “got a boost” during the pandemic and that most household products were now being offered online. Also, the government's a2i program, which aims to promote digitizing public services in Bangladesh, facilitated businesses to bring in bulk produce from rural areas to urban areas to sell through ekShop, an e-commerce marketplace that the government refers to as a “rural assisted e-commerce platform”. The Government of Senegal is also encouraging e-commerce marketplaces, though not specifically for agriculture products, by creating an e-commerce platform that provides easy access to websites of small and medium-sized enterprises (SMEs) selling essential goods, making it easier for small businesses to find customers.²⁸

The team learned that e-commerce marketplaces also got a boost by selling inputs to agriculture customers. Nyarkadera Enterprises in Kenya enables agrovets and farmers to order their inputs online. They experienced increased usage during the pandemic when clients could not physically visit shops. In response to the COVID-19 market disruptions, USAID's Nafuore Warsaaji program in Senegal accelerated the creation of an e-commerce marketplace for its own network of producer groups, aggregators from consolidation centers, and other stakeholders, such as the regulation agency, to digitize commercial transactions.

After COVID-19, some of these actors using e-commerce marketplaces may resume their in-person market transactions, returning focus to their traditional customers. However, all interviewees believed online e-commerce marketplaces would continue to grow as a new sales channel for agriculture producers, requiring

²⁸ Senegal's e-commerce sector helps the country cope with COVID-19, April 24, 2020, UNCTAD, <https://unctad.org/news/senegals-e-commerce-sector-helps-country-cope-covid-19>

market actors to adapt their services, hone digital skills, and adapt to this new way of selling their produce beyond traditional markets.

3.2.1.2 Matchmaking/Linkage services

Matchmaking or linkage services connect buyers and sellers through a digital service such as IVR, SMS, and call centers. They enable buyers and sellers to find each other, sometimes using data analytics and artificial intelligence to create matches. These services have proved to be valuable during the pandemic's market closures and travel restrictions. For example, in East Africa (Kenya, Tanzania, Uganda), Wefarm, which has 2.5 million users, including input retailers and SHFs, connects users, but also allows sellers to send information through SMS directly in response to a request. During COVID-19, Wefarm saw an increase in requests to find inputs at nearby retailers, which was valuable, as many input suppliers had difficulty importing supplies due to border closures. Wefarm also experienced an increase in requests for transportation to help aggregate inputs for delivery.

Two examples of similar services are Viamo's market linkage service, introduced in Niger, and Digital Green's Primary Procurer Marketing Platform, introduced in India (see [Text Box 3](#)). Both launched during the pandemic, though not directly as a response to COVID-19, and their services have been useful in facilitating remote linkages between buyers and sellers. A third example reported by a digital services provider, mPower in Bangladesh, matched buyers and sellers of cattle. The digital cattle shop launched quickly in time for the Eid al-Fitr holiday in response to market closures and fear of traveling due to the pandemic. Sellers could post photos of their cattle for buyers to review.²⁹

Text Box 3. Digital Green

Digital Green

Digital Green is best known for its work integrating videos in agriculture extension and advisory services, but it is also working to figure out ways to link smallholder farmers to buyers. Its first attempt at this was an "Uber pool for logistics" named Loop. Despite serving over 25,000 farmers in India and transporting \$15 million worth of fresh produce, Digital Green could not find a viable business model to sustain this linkage. During COVID, Digital Green started experimenting with a different model it calls the *Primary Procurer Marketing Platform*, which offers an example of ways to complement WhatsApp with more capabilities. It leans heavily on WhatsApp because it is so widely used, but goes beyond it to use chatbot,³⁰ artificial intelligence, and a web-based storefront for each farmer group. With the storefront, farmer groups can list their products easily in searchable catalogs with photos and videos, not simply as documents uploaded through WhatsApp. Payments are made online using a web platform where each farmer group has an independent digital profile to engage buyers rather than being commodified in a larger aggregated marketplace. Digital Green is still experimenting with how the process works, but it is an intriguing example of turning to WhatsApp for a complementary communications channel between the farmer group and buyers.

Digital matchmaking/linkage services proved to be a useful way to connect distanced buyers and sellers during the pandemic and keep markets open for both inputs and outputs.

²⁹ Per mPower Social, the software developer, this application was developed for the Bangladesh Livestock and Nutrition Activity. Roughly 2,000 farmers used the service but few farmers actually sold anything because buyers did not know about the service. The developer thought that the service would continue post-pandemic with some enhancements to make it financially and organizationally sustainable.

³⁰ https://discover.bot/bot-talk/what-is-a-chatbot/?ref=GADW-cpc-n5b1cyue&pk_cid=1021873&pk_campaign=gadw-search&gclid=CjwKCAiAkjKCBhAyEiwAKQBCKlPntZVnxLyxN5VbHUsz5_0z3dvB6IG45899GbL8UHsI8BRXIR4D7RoCdFEQAvD_BwE

3.2.1.3 Farmer management solutions

Producer groups used farmer management solutions to more readily respond to pandemic market disruptions by rapidly facilitating communications with SHFs. Many Feed the Future activities over the past 10 years have set up such digital applications to track metrics required by the USAID monitoring and evaluation requirements for their activities, such as number of farmers reached in training or yields by farmer. Some of these have evolved into “solutions” for farmer groups and outgrowers to organize themselves, by tracking members and services, aggregating and facilitating purchase of inputs, selling outputs, as well as providing advisory services. These solutions can be managed by a farmer group such as NASFAM in Malawi (see [Text Box 4](#)) or by a third-party service that uses them to manage/organize farmers and deliver services such as mLouma in Senegal (see [Text Box 5](#)).

Text Box 4. NASFAM

The National Smallholder Farmers' Association of Malawi (NASFAM) works with 100,000 SHFs (53 percent women) to increase yields, output quality, and market access. The first wave of COVID-19 disruptions was especially challenging as it occurred at the beginning of the marketing period that starts in April. Normally, SHFs aggregate their produce to achieve better pricing from formal buyers, but with the restrictions on group gatherings, and concern that a broader lockdown may occur, many SHFs decided to sell quickly even if it meant harvesting too early or selling for lower prices to informal buyers. Many of the formal buyers were reluctant to travel to rural areas where safety precautions were less strictly enforced. Border closures also prevented exports of most products, and the subsequent demand shifts impacted prices offered to SHFs. These disruptions resulted in reduced income and an inability to invest in production for the following season.



At the beginning of the pandemic, there was not enough time to prepare actors to adopt new innovations that could be used immediately, though some were eventually adopted later on. NASFAM, which buys directly from SHFs and links them to formal buyers, started to use bulk SMS services (through a mobile network operator) and WhatsApp to maintain communications with SHFs and buyers. Also, for the first time, buyers initiated negotiations through WhatsApp by requesting SHFs to send photos of their produce so they could strike deals. These new digital solutions generated efficiencies and enabled SHFs to earn more compared to before when buyers would pass on to farmers the costs of traveling daily to collect and store produce in their warehouses. Despite efficiencies gained, a final barrier in the process is the payment transaction. The government temporarily required mobile money providers to reduce fees for transacting across providers, and NASFAM promoted uptake of mobile money. However, after transaction fees resumed, SHFs were reluctant to continue incurring the high fees. In this more efficient process, finishing the transaction remotely is still incomplete, as traveling to make the final payment in person is costly. A representative reflected that one silver lining to COVID-19 could be market pressure to make mobile payments more affordable and accessible, saying: “If we can engage with SHFs and get them to aggregate and seal the deal remotely, it’s a big benefit for the buyer and SHFs.”

Text Box 5. mLouma

mLouma in Senegal provides a range of digital services to agriculture market actors, especially farmers. The service offers an example of a solution that adapted and expanded its services in response to COVID-19. The founder and CEO began the service in 2012 with weather information collected through his solution, in collaboration with the National Agency of Civil Aviation and Meteorology (ANACIM), and delivered through feature phones or smartphones. It expanded by offering a communications network between actors—up to 50,000 so far—to exchange information (at first, focused on onion and cowpeas). During COVID-19, the service has steadily expanded with training offered on farming techniques,



financial literacy, and more, all in local languages; and its latest offering is a marketplace. This is a B2B solution where agriculture market actors (farmers, aggregators, buyers) can set up their own digital “shops.” In partnership with a bank, transactions can be processed on the platform, which enables the bank to view the transaction histories of actors and review for potential creditworthiness. Farmers without smartphones can tap this marketplace by calling the mLouma call center as well. So far, according to mLouma, 10,000 actors are using this marketplace. mLouma did not expand its marketplace because of COVID-19 but the mobility restrictions and closures of the pandemic have accelerated its growth.

Some farmer management solutions have been built based on international software solutions, such as software from [Dimagi](#) or [Taroworks](#), or by local digital services providers, such as Innov-Tech in Burkina Faso. Others, such as [AgriConecta](#) (see [Text Box 6](#)), had been in the planning stage, but when COVID-19 struck, their in-house development and implementation accelerated.

Farmer groups that had been regularly using management solutions could respond to pandemic disruptions by quickly contacting their members, informing them of market restrictions and opportunities, collecting and sharing information on inputs, and even facilitating aggregation and sales of outputs, disseminating information (e.g., correct information on COVID-19), and delivering advisory and extension services. For example, [Farmerline](#) in Ghana leveraged its established solution and quickly disseminated information on the facts about COVID-19 to farmers, disbursing credit to its input suppliers. However, in a different example, Grameen Foundation in Ghana had not been using its solution to regularly communicate with its SHFs by mobile. It found that at the onset of COVID-19, many members’ phone numbers had gone dormant due to lack of use. As a result, Grameen Foundation did not have a way to communicate quickly with some members.

In short, such farmer management solutions proved valuable to help groups of farmers quickly adapt to pandemic restrictions.

Text Box 6. AgriConecta

[AgriConecta](#) is the core of a comprehensive digital farmer management solution developed by [Popoyan](#), supported in part by USAID’s [Feed the Future Guatemala Innovative Solutions for Agriculture Value Chains Project \(PROINOVA\)](#). It was not created due to COVID-19 disruption, but its launch was accelerated because of it. AgriConecta currently provides online support to over 1,000 small-scale producers in Guatemala’s Western Highlands, including technical support for crops, weather, market prices, lists of input suppliers, and more. The platform helps farmer groups and a major agribusiness maintain resilience by exchanging timely alerts and advice on timing of production activities and availability of inputs. Over 20,000 farmers, supported by Popoyan, will be registered on the solution so they can access services across the market system including a marketplace to purchase inputs (using digital payments), production advice and services, and post-harvest warehousing and processing. Producers can sell to Popoyan as well as different buyers. Basic information will be maintained for each farmer (e.g., plot size, crops, yields), which they can monitor through a smartphone application. Input providers and other market actors (e.g., service providers, buyers) will have access to relevant components of AgriConecta through the web.



Text Box 7. 12/12 Alliance

When the pandemic struck, closures and quarantines disrupted transit to and from the capital of Niamey. USAID's 12/12 Alliance program, which works with Producer Enterprise Agents (PEAs), was prepared to stay engaged with its network of 19,000 smallholder farmers from six unions of cooperatives. The PEAs use Taroworks, a mobile customer relationship management (CRM) and field service application, to collect data and share agriculture training information (including videos), and they could easily maintain remote communications with SHFs during the pandemic. Access to farming inputs was not significantly impacted, but movement of commodities was disrupted to some extent, especially on the border with Nigeria. Some SHFs had lower incomes from sheep sales when prices declined before the festival of Tabaski, the most important season for selling sheep. To support the SHFs, the PEAs communicated to SHFs about market prices and some sheep producers decided to delay sales or sell locally—a decision that helped lead to higher overall returns. Financing for Taroworks licenses will end when the project does and it seems too costly for most of the Unions to renew them, however the 12/12 Alliance has developed an Android application with extension content and unions plan to use the videos, application and WhatsApp for the PEAs to continue to provide extension services and price information to their members. The unions will use WhatsApp to continue providing extension services and price information to their members. Some PEAs have also been onboarded as Airtel mobile money agents to sell mobile money services to the SHFs, which they will continue after the project ends. For Niger, the digital ecosystem is still nascent and solutions may be simple, but market actors have made use of them during the pandemic.

3.2.1.4 Asset-sharing services

The research team did not identify many examples of asset sharing (e.g., rental of assets and mechanization services) or shared economy digital services, and it was not deemed a trend in the research although there is a broader global trend of increases in such services.³¹ COVID-19 caused many market disruptions that impacted SHFs' ability to hire labor and equipment due to social-distancing policies, facility closures, and travel restrictions that affected movement and availability of migrant labor. One asset-sharing service that did address these challenges, and demonstrated the value of such services, is TROTRO Tractor in Ghana. Both TROTRO Tractor and Hello Tractor in Nigeria and Kenya use digital platforms that enable SHFs to schedule mechanization services like ploughing, pesticide spraying, and planting. While Hello Tractor uses booking agents in addition to a booking application, TROTRO Tractor also enables SHFs to request services using a basic mobile phone with an Unstructured Supplementary Service Data (USSD) short code and pay for them remotely. During the pandemic, TROTRO Tractor experienced an increase in demand for the rental of tractor services in Ghana and even expanded its services to neighboring Togo and Benin.

31 Digital sharing economy can be described as "sharing assets—physical, financial, and/or human capital—between many, without transferring ownership, through a digital platform to create economic value for at least two parties." Dalberg, Sharing Resources, Building Economies, accessed April 2, 2021, <https://www.digitalsharingeconomy.com/>

Text Box 8. TROTRO Tractor

TROTRO Tractor Limited is an agriculture technology company founded in Ghana in 2016 to change the lives of SHFs through a platform that makes agricultural mechanization services available, accessible, and affordable. With 20,000 SHFs and 500 tractors in Ghana, TROTRO Tractor is now expanding its services to Benin, Nigeria, Togo, and Zimbabwe. The service started by renting tractors to offer farmers ploughing services, at which point TROTRO Tractor realized that SHFs need a full line of “crop care” services, adding rental options for spraying, planting, and harvesting. The service is accessible to SHFs through basic feature phones and they can sign up or request services by dialing a USSD short code. Meanwhile, tractor owners can use a mobile application to remotely monitor the location and use of their tractor. The process is made seamless with final payment transacted using mobile money.



Since the pandemic, requests have increased as SHFs are pressed into transacting remotely. Before COVID-19, SHFs still wanted to make bookings in person at the office, but now TROTRO Tractor encourages them to send requests through the short code or download the app, which provides a more efficient experience. Marketing of services to onboard customers has been more challenging though because TROTRO Tractor used to do community “tractor day road shows” to demonstrate how mechanized ploughing can improve production, but had to quickly adapt to using more radio, community information centers, and TV for promotion, and interactive voice response (IVR) services for onboarding SHFs.

Since the pandemic, TROTRO Tractor has partnered with the Government of Togo’s COVID-19 Resilience Program and GIZ in Benin to launch services in neighboring countries as they have seen the value in remote transactions. Though TROTRO Tractor has a sophisticated digital platform that can track tractors and service delivery as well as data on acreage ploughed and quantity of crops planted, it’s the simpler digital services (USSD and mobile money with basic handsets) that are making an impact on SHFs’ livelihoods during the pandemic. TROTRO Tractor’s founders believe SHFs are gaining more trust in the service, and their use will continue.

Though asset-sharing services were not identified as a trend, the potential value for them is strong, especially during market disruptions, and with use of digital tools, market actors can more readily adopt and use these services.

3.2.2 Increased uptake and use of existing solutions

The research team identified several digital solutions that agriculture market actors increasingly adopted to manage their agriculture transactions. These are not new services but all actors across the value chain adopted and used them to some degree. For some actors, using these tools was new while others used them for new types of transactions. For example, while many were accustomed to using WhatsApp, Facebook, or digital payments for personal use, many started to use these digital solutions to make market transactions. Many market actors adopted tools upon their own initiative, and in some cases, IPs initiated or introduced them through their partners (e.g., producer groups). The digital services in this category that were cited most by interviewees include digital communication tools, social media, traditional digital media, and digital payments.

3.2.2.1 Digital communication tools

Most market actors used digital messaging to transact, including use of voice, SMS, and digital messaging platforms. Though there are many digital messaging platforms, including Telegram and Viber, most interviewees mentioned WhatsApp. These relatively simple tools proved to be vital for actors in managing their activities, maintaining relationships, and continuing to sell, earn income, and find markets.

All market actors used the simplest digital communication tools, such as voice calls, for conducting transactions that were previously done in person. There were many incidents of actors using voice calls to communicate remotely with those in previously established business relationships, such as producers and traders, producers and individual customers, or producers and input suppliers. The Yalwa activity within USAID's Resilience in the Sahel Enhanced (RISE) program in Niger noted that some market actors adapted to successfully using phones for negotiations and selling, though they still had to make final payment transactions in person due to limited use of digital payments. In an interview with the National Fish Processors and Traders Association in Ghana, a representative explained how they used their phone to communicate with their regular customers when physical markets closed. They could negotiate prices, send photos if requested, put the fish on public transport, and receive a mobile money payment. It was not established whether they are making more or less money, but they said they had to find a way to earn income. They further explained that they found it to be a better experience than "sitting all day in the hot sun in the market negotiating with customers that bargain down to the lowest price."

"There are 2-3,000 people in the ecosystem (agronomists, farmers, input retailers) with one of our partners, and initially we were using a specific Bangladeshi developed app (similar to WhatsApp) to engage, but as we went along we realized we can't be specific to just one app but need to use social media (Facebook, WhatsApp) that's open sourced and can be downloaded by anybody-the key to all of this is a platform that allows discussion rather than just a repository of information. When farmers have a problem, others in the knowledge ecosystem can respond. It's very visual with WhatsApp - for example, you can send a photo of a yellow leaf or a pest and someone within that ecosystem can respond with advice as to a remedy." -

Representative, Bangladesh Rice and Diversified Crops Activity (Rice Activity)

Farmer organizations, digital technology providers, and input suppliers used bulk SMS blasts to provide vital information to assist actors with market transactions. Many actors used bulk messaging to share factual information on COVID-19, which helped to dispel widespread misinformation circulating in many countries that was impacting the ability to transact. For example, rumors in some areas that COVID-19 could be transmitted on the surface of produce hindered sales, and in India, where there was misinformation that chickens were carriers of COVID-19, badly impacted poultry farmers.³² In Ghana, Farmerline expanded its bulk SMS services to include WHO COVID-19 voice messages to 18,000 farmers in multiple local languages and set up a call center to offer farming information. In Nepal, USAID's KISAN II program supported its agrovets to send bulk SMS text messages to customers, informing them when and where they could access inputs during restricted opening hours imposed on retail shops, and to help keep their relationships afloat. iShamba in Kenya added 20,000 new users during COVID-19 and used their SMS services to educate farmers on ways to adapt to the situation, for example, how to substitute manure for store-bought fertilizer when inputs were scarce, or how to sell on digital marketplaces, such as Mkulima Young, an online marketplace for farmers, when in-person marketplaces were closed.

The full range of market actors from SHFs to input suppliers, traders, aggregators, and producer groups used digital messaging platforms extensively, and increasingly, for new ways to conduct agriculture transactions. WhatsApp was often cited as an important digital messaging platform³³ to facilitate agriculture transactions when travel restrictions were in place and in-person interactions became complicated. Farmers used it to share information and photos of produce with potential buyers, and to sell to current and new buyers. In Senegal, USAID's Dekkal Geej program reported that local fishing organizations created groups to share information on

32 IFPRI, Addressing COVID-19 impacts on agriculture, food security, and livelihoods in India, April 8, 2020 <https://www.ifpri.org/blog/addressing-covid-19-impacts-agriculture-food-security-and-livelihoods-india>

33 For a description of messaging apps and platforms: https://en.wikipedia.org/wiki/Messaging_apps

pricing and product availability. Also in Senegal, the National Council for Rural Concentration and Cooperation,³⁴ the largest farmers association, started sharing information to members on where the government was distributing seeds and fertilizers. USAID's Sustainable Fisheries Management project in Ghana created WhatsApp groups with representatives from fish landing sites to disseminate COVID-19—related information. Fishers continued to engage one another in these groups by sharing fisheries-related information. USAID's Livestock and Nutrition program in Bangladesh also reported that cattle feed companies created groups on WhatsApp and Viber with distribution actors like dealers and retailers to enhance interactions between them.

Only a few actors reported using advanced features on communication platforms such as WhatsApp Business, or using more functional smartphone-based applications with specific business functions. However, one interviewee from Producers Direct combined both WhatsApp Business and SMS—creating farmer groups in WhatsApp for sharing training materials to those with smartphones, and continuing to use SMS for those without. Others are augmenting WhatsApp for business purposes with chatbots to allow more interactivity between buyers and sellers or for those accessing customer support.³⁵

These examples demonstrate the wide uptake of digital messaging platforms that have increased usage by connecting agriculture market actors, facilitating negotiations, and sharing valuable market information.

3.2.2.2 Social media

Market actors reported increased use of social media platforms like Facebook, Twitter and YouTube during the pandemic to seek information and facilitate transactions. Technical advisory service providers used YouTube to replace in-person training and extension services. For example, USAID's Nepal Seed and Fertilizer program reported that during the lockdown, many youth returned to rural areas and were using Facebook, Viber, and YouTube to access guidance on agriculture practices. A range of market actors including individual producers, aggregators, input suppliers and traders reported that they used Facebook and, in a couple of cases, Twitter to market products and connect with buyers. While individuals and groups, like the Asian Farmers Association,³⁶ used their regular Facebook pages for transactions, some individuals used Facebook Marketplace,³⁷ which is a specific feature on Facebook.³⁸

34 Conseil National de Concentration et de Coopération des Ruraux, <http://www.cncr.org> (accessed March 2021)

35 This example by Robi Axiata in Bangladesh shows how chatbots can be used in WhatsApp. It is for improving customer support but chatbots could also be used to improve buy/sell capabilities of WhatsApp. Sharma, Ray, Robi Axiata Intros WhatsApp Chatbots to Serve as Customer Care Agents, The Fast Mode, <https://www.thefastmode.com/services-and-innovations/17722-robi-axiata-intros-whatsapp-chatbots-to-serve-as-customers-care-agents>

36 <https://www.facebook.com/AsianFarmers/posts/sara-bangla-krishak-society-sbks-a-national-federation-of-farmer-organizations-i/1888192484645101/>

37 Here are examples of individual vendors on Facebook Marketplace:

https://www.facebook.com/marketplace/item/391715938595135/?ref=search&referral_code=marketplace_search and

https://www.facebook.com/marketplace/item/125837022738279/?ref=browse_tab&referral_code=marketplace_general

38 While users can market from their individual Facebook pages, Facebook marketplace is a specific feature set up for selling, available in some but not all countries: <https://www.facebook.com/marketplace/learn-more/>

USAID's Bangladesh Digital Agriculture Activity reported that rural youth from family farmer groups started marketing on Facebook to sell produce, and several women entrepreneurs in Bangladesh started to use Facebook to market and sell fish they procured in rural areas (see [Text Box 9](#)). Beimoni Outgrower Business Network Association in Ghana has a Facebook page where it marketed its produce, but until COVID-19, buyers still wanted to visit in person to transact. Now the association not only markets its produce on Facebook and shares videos, but also discusses the quantity and price through video calls initiated on its Facebook page, viewed as a strategy for promoting trust. The association then packages and sends the produce by car and accepts payment through mobile money or bank transfer. As explained by a representative of the association, "Facebook and WhatsApp were always there, but not used effectively until this time." One interviewee in Niger, Viamo, noted that new markets were becoming available on Facebook in Niger, mostly launched by students who knew someone with produce (presumably family in rural areas) and were acting as collectors to market it online. Twitter was less common, but noted by Goshen Farm Exporters in Kenya, which used it, along with Facebook, Instagram, and even LinkedIn, as a platform to market to potential buyers and reach import distributors in other countries where these platforms are more commonly used.

"We linked local dairy processors with food delivery platforms and provided technical support to develop product descriptions with pricing, take and upload photos, and on how to subscribe. These connections continue, even though we saw usage going up and down based on market restrictions, but after 9-10 months to our surprise the trend continues. I met a dairy processor and saw the transformation in terms of his products. He was trying to sell on Facebook and suddenly he found a new market for a different product than what he used to make, so now he diversified products based on demand in the market. We asked if he sees long term potential and he said as long as he can deliver quality and pricing he can sell on these new channels." - **Representative, Bangladesh Livestock and Nutrition Activity**

Text Box 9. River Fish

River Fish was one of two businesses launched by female Bangladeshi entrepreneurs who started and scaled digitally enabled businesses during the pandemic. One re-launched her business selling local fish in response to border closures and travel restrictions. She used Facebook to market her products with payment on delivery. After less than a year, she has over a dozen employees and a warehouse. The other two women entrepreneurs also started web-based markets for local fish, but are using the [Women & e-Commerce Forum's \(WE\)](#) Facebook-based platform. WE is a Bangladeshi organization encouraging women in e-commerce.



The research team found market actors using Facebook in all of the focus countries to transact, but it seemed to be particularly popular in Bangladesh. One report claims that 300,000 Bangladeshi stores use Facebook as their e-commerce site.³⁹ This reflects an increase due to the pandemic, as many mom-and-pop stores were forced to go online to reach their customers, and Facebook offered a simple digital platform for selling and buying. This surge in Bangladesh is not isolated; the report claims some 160 million small businesses globally have turned to what is now termed, "F-commerce."⁴⁰ Facebook itself has responded to this surge in usage by adding features to make it easier to catalog goods and process payments.⁴¹ Another provider, [ShopUp](#), which supports small and medium-sized enterprises to build and manage their businesses through technology solutions, now

39 Christopher, Nilesh, What to Buy a Parrot? Please login via Facebook, July 21, 2020, Rest of World, <https://restofworld.org/2020/bangladesh-economy-runs-on-facebook/>

40 Ibid.

41 For example, Facebook has introduced Facebook Marketplace in some countries. This link offers a list of countries (including Ethiopia, Nigeria, Haiti, Thailand, and many more): <https://www.facebook.com/marketplace/learn-more/> and a directory of these Facebook Marketplace countries identifying popular cities in each country: <https://www.facebook.com/marketplace/directory/>. Some of these introductions are very recent. For example, in late 2020, it was introduced in Kenya per Facebook Officially Available in Kenya, 10/16/2020, Tech-ish.com <https://tech-ish.com/2020/10/16/facebook-marketplace-kenya/>

offers these same Facebook businesses microcredit eLoans, business advice, and even help with last-mile logistics (through DHL).⁴²

The strength of these tools is that they are widely available and familiar, and enable users to form groups and share information, photos, and more. They allow users to post photo catalogs of products, manage relationships with buyers and sellers, and in some countries enable users to easily move from an agreed sale to a digital payment.⁴³

3.2.2.3 Traditional digital media

Many market actors said they also used several “tried and true” digital tools and services to manage market transactions in response to pandemic disruptions. These include radio, IVR systems, videos (e.g., live or animated) disseminated across a variety of channels, television, and call centers. Service providers specializing in these digital channels, such as iShamba and Farm Radio International, saw dramatic increases in use, and expect that these will continue to be used as critical digital tools and services to inform agriculture market actors with information on agricultural practices, location closures, and other relevant information for market transactions. Several programs used traditional digital media, including the AGRA-implemented Partnership for Inclusive Agricultural Transformation in Africa (PIATA) program in Ghana, which used community radio for farmer outreach, the Mediae Company, which used its Shamba Shape Up television program to inform SHFs on location of inputs in Kenya, and USAID’s AgDiv program in Malawi, which works with Farm Radio to push messaging on agriculture inputs.

3.2.2.4 Digital financial services

Considerable research has been conducted on the use of digital financial services (DFS) to respond to the pandemic disruptions,⁴⁴ especially the increased use of digital payments.⁴⁵ However, given the scope of this study, the research team did not conduct a thorough examination on the use and/or uptake of the full range of DFS that includes credit, savings, insurance, and payments. However, most of the interviewees in this study cited the increased use of digital payments during the pandemic, and some noted the value of digital savings used by some actors, especially when physical branches or group savings meetings were halted. For example, Grameen Foundation explained how mobile money accounts used to save for inputs had shown to be a “resiliency tool” for women farmers in Tanzania where they witnessed a dip in group savings that were done in person, but much less so for those saving into mobile money accounts. Juhudi Kilimo Ltd, a microfinance institution (MFI) in Kenya, serves 47,000 smallholder farmers and micro entrepreneurs (including agribusinesses) with access to credit primarily through solidarity groups. In response to COVID-19, Juhudi Kilimo ramped up the transition to mobile money loan repayments to nearly 80 percent of its clients and experienced an increase in requests for its small emergency digital loan product disbursed through its mobile money accounts.

42 Gilchrist, Karen, Facebook and three millennials are changing the startup scene in Bangladesh, July 23, 2018, CNBC Make It, <https://www.cnbc.com/2018/07/17/shopup-bangladesh-start-up-uses-facebook-to-help-micro-entrepreneurs.html> and <https://shopup.com.bd>

43 Acceptable Facebook payment methods vary by country and currency as listed here: <https://www.facebook.com/business/help/212763688755026?id=160022731342707>

44 How Can Digital Financial Services be Utilised in Response to COVID-19?, DAI, 17 July 2020, <https://dai-global-developments.com/articles/how-can-digital-financial-services-be-utilised-in-response-to-covid-19>

45 GSMA, State of the Industry on Mobile Money Report 2021, (accessed March 2021), <https://www.gsma.com/sotir/>

Both Opportunity International and Bangladesh SME Corporation Ltd found that COVID-19 was an impetus for traditional financial service providers to invest in the transition to digital channels. One example of this is Musoni, a DFS provider in Kenya. Musoni is responding to COVID-19 by launching technology enhancements to digitize operations and streamline loan management as a way to reduce the need for in-person visits and expand alternative delivery channels, with a goal of lending to 15,500 farmers.⁴⁶ In Nepal, USAID's KISAN II program supported a pilot with Laxmi Bank to onboard agrovet as branchless banking agents.⁴⁷ The pilot started before COVID-19 and was slow to get off the ground during the first year. Rana Agrovet, which has provided services to 1,500 households in rural Nepal as an agrovet since 2013 and a branchless banking agent since 2019, explained that since the pandemic, more customers are using its digital payment services (e.g., bill pay, remittance cash-outs) and are finally recognizing the value of them. UNCDF in Nepal, in its partnership with Prabhu Management to digitize the dairy value chain, also found “the use of DFS services [including agriculture input payments, remittances, and bank to wallet transactions] spiked to nearly 600 percent during the COVID-19 lockdown period, and nearly 56 percent of users used DFS services for the first time during the lockdown period.”⁴⁸ Access to financial services is well documented in its ability to help SHFs and entrepreneurs be resilient in the face of shocks and disasters,⁴⁹ and it seems to be proving useful for market actors during the pandemic.

Early in the response, the WHO issued guidance to promote use of digital payments as a health strategy to reduce COVID-19 transmission.⁵⁰ Subsequently, whether influenced by this or not, some digital service payment providers made it more affordable to transact. Also, some government regulators instituted policies to reduce physical exchange of currency and facilitate use of digital payments by mandating that mobile money service providers reduce or remove fees, remove transaction limits, and/or adjust Know-Your-Customer (KYC) regulations on small-balance mobile money accounts.⁵¹ It is beyond the scope

“After the lockdown, customers gradually increased their use of DFS and mobile banking. About half of the customers used DFS to transfer money and half used it to pay electric bills, TV and phone recharges. Gradually they started opening accounts to save money in the bank instead of at home.” - **Agrovet and Branchless Banking Agent**

“Producers are sending photos on WhatsApp and buyers are paying with Orange Money or by BA bank account digital transfers. Producers knew the aggregators before, but this system was not developed. Before at the market you would see 100 people negotiating, but now since restrictions you can buy without going anywhere. You can travel from one region to another now and you see people are really adapting to market their products via WhatsApp and then using digital payments. COVID-19 improved this process and now we even see small shops using digital payments. It really impacted the way they are used to doing business.” - **Representative, Nafore Warsaaji Program in Senegal**

46 Partnering for Innovation, COVID-19 Pandemic Response: Musoni (accessed March 2021), <https://www.partneringforinnovation.org/musoni-covid>

47 USAID Feed the Future, Branchless Banking: Bringing digital financial services directly to farmers' doorsteps, (accessed March 2021), https://winrock.org/wp-content/uploads/2020/06/BLB-One-Pager_2Jun2020.pdf

48 UNCDF, Digitalizing Rural Financial Ecosystems – Journey and Learnings from Digitalization of Dairy Value Chain in Nepal, January 7, 2021, <https://www.uncdf.org/article/6425/digitalizing-rural-financial-ecosystems---journey-and-learning-from-digitalization-of-dairy-value-chain-in-nepal>

49 UNCDF, Digital Financial Services in Crisis Contexts: Improving Response, Building Resilience, August 2016, <https://www.uncdf.org/download/file/127/659/dfsincrisisbriefpdf>

50 WHO and Global Health Cluster Cash Task Team, Guidance note on the role of Cash and Voucher Assistance to reduce financial barriers in the response to the COVID-19 pandemic, in countries targeted by the Global Humanitarian Response Plan COVID-19, April 2020, <https://www.who.int/health-cluster/about/work/task-teams/Guidance-note-CVA-COVID.pdf?ua=1>

51 Some examples of policy mandates as learned from the literature review and interviews include: Kenya Safaricom implemented a fee waiver on mobile money, Malawi mandated removal of fees to transfer money between competition mobile money providers, Ghana allowed the opening of small-balance mobile accounts without requiring identity cards for KYC and removed certain transaction limits for transfers. Rwanda endorsed mobile money as an essential service during the pandemic

of this study to determine the extent of the impact of these policies on use of digital payments, yet one example may be an indicator. In Malawi, NASFAM noted how the decrease in transaction fees for sending/receiving digital payments between different mobile money providers actually influenced some SHFs to use digital payments, but many stopped after the fees resumed (see [Text Box 4](#)).

Many interviewees cited examples where agriculture market actors discovered the benefits of being able to remotely complete their agriculture transactions with digital payments, enabling them to move from remote negotiations and sales through to the final payment. The research team spoke to many interviewees who noted examples of increased adoption. [One Acre Fund](#), already on a path toward digital transformation with fully cashless operations, re-prioritized speeding up paperless loan repayment in Kenya, Malawi, Rwanda, and Uganda because of COVID-19.⁵² A representative from the National Fish Processors and Traders Association in Ghana explained how the association had received training on how to use mobile money by USAID's Sustainable Fisheries Management Project before COVID-19, but only since has it started to use it. They explained how it has helped them to transact with customers and also pay fishermen directly. USAID's Livestock Market Systems program in Kenya noted that agribusinesses and Savings and Credit Cooperative Organizations (SACCOs) are using [M-PESA](#) more to transact. Farmerline in Ghana used to have field officers follow up with agri-dealers in its shops for loan repayments, and since COVID-19, Farmerline has transitioned to mobile money and made efforts to ensure farmers could transact with mobile money for purchases. Finally, many online e-commerce providers also expressed that having the ability to incorporate digital payments enabled a seamless transaction on their platforms.

Most interviewees cited mobile money as an important service for market actors, whether they used it on e-commerce marketplaces, on other paid services like asset sharing, or when conducting more informal transactions like buying inputs and selling produce through Facebook⁵³ and WhatsApp. In conducting these informal transactions, interviewees noted that whether the customer paid in part or full up front versus after delivery depended on the level of trust and familiarity in the relationship. Most informants noted that mobile money use increased, and according to the GSMA Mobile Money State of the Industry Report 2021, registered mobile money accounts increased globally by 12.7 percent in 2020. It summarized that "mobile technology, and mobile money, in particular, [had] a significant role to play in keeping people connected, delivering vital financial support and providing safe, no-contact ways to pay for food, electricity and other life essentials."⁵⁴

52 One Acre Fund, Using Technology to Support Farming in the Face of COVID-19 (accessed March 2021), <https://oneacrefund.org/blog/using-technology-support-farming-face-covid-19/>

53 Though Facebook does have an integrated payment option in some markets called Facebook Pay, most interviewees noted that the payments were conducted through separate mobile money transactions, <https://pay.facebook.com/>

54 GSMA, State of the Industry on Mobile Money Report 2021 (accessed March 2021), <https://www.gsma.com/sotir/>

3.3 EXPECTED ENDURANCE OF DIGITAL TOOLS AND SERVICES POST-COVID-19

Many market actors changed how they did their work through the use of the new, adapted, and existing digital solutions. Most reported they do not think they will stop using digital tools and services they had begun using during the pandemic because of the benefits they realized. This includes the convenience and cost savings of remote transactions, the ability to reach new customers and maintain relationships with existing customers, and the ability to access information that helps them make transaction decisions. For example, MyAgro said it found using digital services has been effective to reach customers, provide better services, and lower the cost of service across the board.

A representative from mLouma in Senegal believes that users of mLouma's online marketplace will have experimented for several months during COVID-19, and will see the value in using many distribution channels. A representative from TROTRO Tractor expressed that COVID-19 has made TROTRO's services more convenient for farmers who can access them from wherever they are, thereby helping to fast-track building customer trust.

“People have seen a huge benefit that digital brings to them. Looking at the level of adoption of technology even in most poor communities they won't go back. It's sad to say it but COVID accelerated it and we are leapfrogging now as people are open to trying new things” - **Representative, National Agency for the Information Society in Niger**



Many interviewees also expressed that they believe COVID-19 disruptions have provided momentum to push market actors to adopt and use digital tools and services, including digital solutions that already existed but may have not yet been adopted, such as mobile money transactions. A representative of the Beimoni OB Network in Ghana described how USAID's ADVANCE II program trained several women's groups to use mobile money and they discovered the benefits of receiving remittances from distant family members who could not visit during COVID-19. They believe the groups are convinced of the value of such services and “won't go back.”

Some interviewees emphasized that business relationships and trust between market actors are important. It remains to be seen to what extent actors will revert to selling through traditional in-person channels like physical markets, buying in-person from their trusted retailers, or revert to conducting transactions with only their previous customers (e.g., those who expanded from B2B to include B2C).

However, based on the breadth of stakeholder interviews, our overall conclusion aligns with the premise outlined in a GSMA blog post. These digital tools and services have improved value chains' agility to help support local markets and improved resilience of rural communities so they are better equipped to withstand shocks like COVID-19. Actors could use this crisis as an opportunity to rebuild local value chains and strengthen local businesses and communities.⁵⁵

55 N. Pshenichnaya, et al., Post COVID-19 business un-usual in agriculture value chains, May 20, 2020, <https://www.gsma.com/mobilefordevelopment/uncategorized/post-covid-19-business-un-usual-in-the-agricultural-value-chains/>

3.4 KEY ENABLERS AND CHALLENGES TO DIGITAL ADOPTION AND USE IN RESPONSE TO COVID-19

The pandemic tested the resilience of market actors—they had to act fast and adapt to dramatically changing conditions, and they used digital tools and services to continue their farming and agribusinesses. To help market actors succeed as the pandemic continues or when disruptions occur, it is critical to understand specific challenges and enablers to help prepare market actors to be more resilient in the future. Individuals who lived in an area with network coverage and a robust mobile money service, owned a phone, and were digitally literate with sufficient income to pay for data were enabled to adopt a range of different digital agricultural tools and services to cope with market disruptions. For example, iShamba in Kenya offered its services on WhatsApp to engage in real time with SHFs. This requires a smartphone, and SHFs in rural areas are challenged by lower smartphone penetration, especially in the northern part of Kenya where network connection is poor.

Common challenges and enablers

The challenges for market actors that prevented them from quickly adopting and using digital tools and services are the same challenges that existed before COVID-19. Most interviewees described the common challenges listed below (also referred to as enablers, depending on the perspective):

- Foundational infrastructure, including telecommunication network and power
- Policy and regulations, in particular around mobile money, as many governments were promoting digital payments
- Previous investments in relationships that enabled the transition to remote transactions, such as pre-existing use of farmer management solutions
- Access to devices including basic and/or more advanced feature or smartphones
- Digital skills and literacy
- Social and cultural issues, mainly around women's access to phone ownership and use

Ecosystem challenges

It is beyond the scope of this study to focus on foundational challenges or macro-level policy constraints, even though many stakeholders cited these as barriers or enablers to using digital tools and services. However, resilience of market actors has evidently been enabled by previous long-term investments in the ecosystem, as well as in existing solutions and capabilities. For example, in addition to telecommunications network and policy impacts (e.g., on pricing of mobile money or data), investments in business relationships enabled market actors to more easily transition to new, remote ways of doing business because of the trust that had previously been established (e.g., producer groups implementing with farmer management solutions).

According to the USAID Kenya Crops and Dairy Market Systems Program, the main challenges and enablers experienced by agriculture market actors in the adoption of digital tools during COVID-19 include:

Challenges

- Lack of or low internet connectivity in some regions.
- High internet costs to farmers.
- Lack of two-way feedback mechanisms.
- High cost of smartphones, limiting acquisition by target groups, hence they provide alternative numbers of people with smartphones.

Enablers

- Access to the internet and capability of market actors to access the internet on their premises.
- The program had an existing partnership with 13 local radio stations, which market actors used to promote their products and disseminate extension services to farmers.
- Existing websites that made it easy to create links to push sales and products online.
- Mobile phone penetration in the country.



Mobile phone challenges

Interviewees cited more specific challenges and enablers impacting market actors' ability to adopt and use digital tools and services in the context of responding to COVID-19 disruptions. One key challenge was access to mobile phones. Many service providers offered their services through basic phones and USSD codes (e.g., TROTRO Tractor, iShamba, Viamo), and those without access to a basic phone could not have conducted the simplest of activities (i.e., access critical information, negotiate with other actors, buy and sell, and transact with digital payments).

More complex services required the use of smartphones, mainly for digital communications platforms and access to online e-commerce. Many interviewees cited access to smartphones as a barrier to access services,⁵⁶ as well as corresponding challenges such as digital literacy and affordability of data. In several instances, interviewees noted that these services were used when younger family members, who may be more digitally savvy, had temporarily relocated to rural homes during the pandemic and helped family members to be able to trade.

Gender constraints

Interviewees also expressed that the context of COVID-19 has amplified the gender barrier for women's phone ownership and use. Apart from the economics (e.g., women tend to have less income), women also face normative barriers (e.g., phones may be considered a status asset for men, women may be perceived as using phones for inappropriate uses or shirking household duties). Women are less often able to control phones and transact. Women were impacted more severely by the lockdown as noted above, and their inability to seize opportunities to use digital services to overcome market disruptions may risk exclusion for them in the market system in the near and longer term.⁵⁷ As described by a representative from the National Fish Processors and Traders Association in Ghana, "for women it's been more difficult because women are responsible for all the household expenses for children's school, family, and hospital needs. So when their profit goes down because of the disrupted market, then it's difficult to care for the kids and the family."

Market actors who were well positioned to experience these not as challenges but as enablers (i.e., had access to network coverage, a phone, and the ability to use it) were more likely to use the range of digital tools and services available to help them with their agricultural activities during the COVID-19 disruptions. As explained by Wefarm, digital solutions enabled the combination of access to knowledge on which products were available and where they could be accessed, and then the ability to remotely negotiate and transact to access them at the right time.

⁵⁶ Although feature phones are available that use open-source operating systems (e.g., KaiOS) and enable certain apps on a potentially cheaper device than a smartphone with touch screens, interviewees did not highlight this option. For more on this, see Fu, Rau, The Rise and Success of KaiOS, June 15, 2020, The Passage, <https://thepassage.cc/article/2167>

⁵⁷ CGAP, The Digital Gender Divide Won't Close by Itself – Here's Why, December 15, 2020, <https://www.cgap.org/blog/digital-gender-divide-wont-close-itself-heres-why>

4. Recommendations

The disruptions caused by the COVID-19 pandemic tested the resilience of market actors and their ability to adapt to dramatically changing conditions. Many market actors could adapt and manage their transactions through a range of digital tools and services, many of which are described above. Based on its analysis, the research team proposes the following practical recommendations that USAID and IPs can use to help market actors adopt and continue use of digital solutions, and build resilience for future pandemics or other major disruptions to the agriculture market system.

USAID and its partners should, where appropriate:

- 1 **Ensure target producer groups and other market actors take full advantage of the increase in e-commerce marketplaces where they may be emerging as a new sales channel for agricultural products, substituting in part for in-person marketplaces.** Many interviewees noted that large e-commerce marketplaces were growing quickly in urban areas. Smaller specialty e-commerce marketplaces were also gaining strength in certain countries, such as in Bangladesh and Senegal. This trend has occurred in areas where traditional markets have faced disruptions (such as COVID-19-related market closures or restrictions on travel) and agriculture actors are seeking opportunities to reach their existing and new customers to avoid wasting crops. Post-COVID-19, some of these marketplaces may resume their focus on business customers (B2B), but the consumer-facing services (B2C) are unlikely to completely disappear due to the convenience it brings to highly congested urban areas.

Market actors can benefit from using e-commerce to increase incomes by selling to a diversified customer base and/or increasing sales through the diversification of sales channels. They can also introduce new intermediary services, such as logistics, packaging, and storage to better connect to marketplaces and reduce transaction costs for the e-commerce marketplaces (see [Text Box 1](#) and [Text Box 5](#) on Goshen Farm Exporters Limited and mLouma).

Practical actions that USAID could take include: Assessing the potential for new marketing channels in its respective markets and the new opportunities and/or challenges they might present for USAID's target market actors.

Practical actions that IPs could take include: Supporting producer groups and aggregators in adapting their products and services to leverage this new channel, as well as strengthening their digital skills to access and use them.⁵⁸ Where there is demand and potential benefits to agriculture system actors, IPs could identify ways to support existing or new entrepreneurs offering specialized e-commerce marketplaces. For example, initiatives could include assisting with market research or providing advisory services covering business functions and models or technical features. (Please note: it is not recommended that IPs build new e-commerce platforms but rather leverage existing ones in the market.).⁵⁹

58 This guidance note outlines how e-commerce can specifically benefit women entrepreneurs and recommends actions that can be taken to strengthen their e-commerce business models, digital payments capability, and digital marketing skills: Better Than Cash Alliance et al., Reaching Financial Equality for Women: A 10-point action plan for governments and businesses to rebuild stronger after COVID-19 by prioritizing women's digital financial inclusion, March 8, 2021, <https://www.rfilc.org/library/reaching-financial-equality-for-women-a-10point-action-plan/>

59 See report Findings Section above for examples of both large e-commerce marketplaces and smaller specialized ones in the study's focus countries.

For more information on this topic, see the e-Commerce Marketplaces guidance document in [Annex 4](#).

- 2 **Support market actors to fully leverage the available digital communications tools and social media (e.g., WhatsApp, Facebook, Twitter, LinkedIn) that replaced much of the traditional in-person negotiations and transactions at all stages of the agriculture market system during the pandemic.** Many market actors, such as input suppliers, producers, aggregators and buyers, used digital communications tools on their own initiative, some before COVID-19 and others in response to pandemic disruptions. They used them to source inputs, hire labor, locate equipment, access extension information, and link up with other actors to negotiate and conduct transactions.

Investing in supporting market actors to use digital communication tools and social media will bring a range of benefits. Actors can use these tools to access market information (thereby reducing information asymmetry) and to facilitate communications among themselves to reduce the costs of conducting in-person transactions. They can also use these tools to diversify marketing channels, enabling them to scale and mitigate risks of single channels, and can diversify their customer base, leading to increased sales and potentially higher incomes. Development partners should ensure that market actors are aware of and understand privacy and security issues relate to the use of such tools, as well as how to interpret the terms of service.

Practical actions that USAID and/or IPs could take include: Sharing best practices and ensuring that all agricultural market actors are informed and knowledgeable about specific risks and barriers (e.g., privacy and security issues) associated with using these digital solutions, including how to interpret and understand the complexity of different applications' terms of service.⁶⁰

Practical actions that IPs could take include: Facilitating learning among users (e.g., identify “power users” to share experiences and practices with other market actors). IPs could also provide examples of e-commerce marketplace capabilities not available on social media to encourage market actors to consider joining an e-marketplace to complement their use of social media to facilitate transactions. Examples of such e-marketplace capabilities they might find helpful are searchable product catalogs, digital payments linked directly to a product purchase and options to dispute transactions, and the capability for customers to rate their products, which helps a producer to build a good reputation and potentially attract more customers.

- 3 **Encourage the use of digital farmer management solutions among small and large farmer groups and outgrower schemes.** During the pandemic, digital farmer management solutions helped groups of producers quickly mobilize through remote communication, relaying critical information about COVID-19 and market disruptions, aggregating demand for inputs, and facilitating sale of produce. This helped producers reduce losses and continue to buy or sell despite the disruptions. These solutions can vary in complexity, but their basic capabilities include being able to sort producers by various categories such as types of crops grown or location, “push” audio or text messages to targeted producers, and receive responses from them.

Benefits from implementing farmer management solutions may include better agriculture practices resulting in better harvests, and better prices for produce and inputs gained through aggregation. These additional

⁶⁰ An example of the complex nature of changing terms of service for digital messaging applications: <https://www.bloomberg.com/news/articles/2021-01-11/why-whatsapp-s-privacy-rules-sparked-moves-to-rivals-quicktake>

sales channels can result in greater efficiency and less wasted produce. (See [Text Box 6](#) and [Text Box 7](#) on AgriConecta and the 12/12 Alliance.)

Practical actions that USAID could take include: Encouraging the use of such solutions by sharing lessons learned and examples of such solutions across IPs (and beyond) through a learning event or other channels such as newsletters or reports.

Practical actions that IPs could take include: Working with current or potential users of such solutions to assess their long-term costs and benefits by helping determine the added value of such a solution to their farming practices. For example, buyers who desire greater quality control and more efficient aggregation could achieve these outcomes through a farmer management solution. If a solution appears beneficial, IPs can help determine how it can be financed over time and sustainably to cover operational costs (e.g., assessing if fees for services are viable or if other entities that value this information would help cover costs). IPs can also facilitate pilot activities and, where it is warranted, launch and roll out such a solution. From the outset, designers of any solution need to define a clear value proposition for the producer group, its members, and other stakeholders, such as input suppliers or financial service providers, and develop a corresponding long-term financing plan so they can sustain the solution once the program funding ends.

For more information on this topic, see the Farmer Management Solutions guidance document in [Annex 5](#).

- 4 **Encourage the use of digitally enabled shared services across the agriculture market system that enable actors to procure mechanization and asset rental services.** During the pandemic lockdowns, market actors increased their use of shared services due to the convenience of booking services remotely. SHFs benefit by being able to take advantage of critical services that they could not afford to use individually, and making them accessible through basic mobile phones. These services also maximize efficiency of their resources and increase their productivity through more efficient planting or fertilizer application, for example. (See [Text Box 8](#) on TROTRO Tractor.)

Practical actions that USAID could take include: Facilitating market research to measure demand for a range of shared services and analyzing the data insights. USAID could use Mission-wide competition activities to encourage entrepreneurs to explore such agribusiness opportunities.

Practical actions that IPs could take include: Facilitating farmer demonstration days to enable SHFs and other potential actors to learn about the services. IPs could also help match demand with supply for shared services such as machinery, warehousing, and weighing or packaging facilities.

- 5 **Conduct landscape assessments of digital agriculture tools and services offered to support agriculture market actors and recommend ways to leverage innovative digital services that are emerging and/or being adapted in response to COVID-19.**⁶¹ Through this analysis, the research team identified many digital services that offer solutions at different stages of the agriculture market system. For example, Wefarm provides information on where to purchase input supplies. At the post-production stage, Mkulima Young helps producers identify transportation to deliver products, while solutions such as iShamba and Viamo help disseminate information on market prices. Though the demand for some services

61 These are recommended as high-level, rapid assessments of digital tools for agriculture, unlike the Digital Ecosystem Country Assessments (DECAs), which are broad and comprehensive.

may decline post-pandemic, many of the study's interviewees felt that some of these services had gained enough momentum during the pandemic to scale and be financially viable.

The availability of these digital tools and services is expanding and as of 2020, the GSMA's Digital Agriculture Map dataset contains over 700 active digital agriculture services.⁶² Market actors are better placed to use digital solutions when they are aware of them and understand how to safely access and use them. The benefits to conducting regular digital agriculture assessments are that USAID and implementing partners will have a complete and up-to-date picture of what opportunities exist in the market to promote the use of valuable digital services that agriculture market actors can benefit from.

Practical actions that USAID could take include: Conducting rapid and regular market assessments to identify what digital agriculture services are available, who the service providers are, where they are located, their specific offerings, and how these meet the demand and needs of market actors.

Practical actions that IPs could take include: Conducting assessments and mapping exercises to identify priority needs and demand for such services, as well as current use of digital services, among local market actors. IPs can leverage this market research and, where relevant for an activity's focus, vet the costs, benefits, and user requirements for such services to determine their relevance to market actors. IPs should share information about the digital services and service providers that are already part of their programming to raise awareness with activity partners and market actors and/or facilitate linkages to service providers.

- 6 **Continue working to sustain and increase use of DFS, including digital payments, which are essential for facilitating safe, remote transactions.** During the pandemic, market actors used digital payments at all stages of the agriculture market system—in the planning stages to facilitate payments for inputs, at production stages to hire equipment and transportation, and at the post-production stages to pay for produce. In some cases, market actors also benefited from the convenience of digital credit and savings accessed through digital accounts. (See [Text Box 4](#) and [Text Box 5](#) on NASFAM and mLouma.)

Investing in the promotion of DFS can lead to a wide range of benefits for all market actors across the agriculture market system. The benefits of creating partnerships between actors, such as financial service providers and producer groups or agribusinesses, can lead to greater financial inclusion for actors using digital accounts. It can enable them to build transaction histories to access digital credit, and to access savings accounts and potentially digital insurance. The benefits of appropriate and affordable financial services are extensive, as they facilitate agricultural activities while also enabling resilience in challenging times.

Practical actions that USAID could take include: Promoting the guidance already developed by USAID on use of digital payments and DFS to finance and ensure agriculture practices as well as incorporating digital payments across agriculture value chains.⁶³

Practical actions that USAID and/or IPs could take include: Conducting demand and supply side market research, and/or disseminating existing research regarding the current availability and use of DFS and digital payments by all actors in the market system.

62 GSMA Digital Agriculture Maps, accessed April 2020, <https://www.gsma.com/r/digital-agriculture-maps/>

63 USAID Feed the Future, Digital Tools in USAID Agricultural Programming Toolkit, February 2018, https://www.usaid.gov/sites/default/files/documents/15396/Programming_Toolkit_-_Digital_Tools_for_Agriculture.pdf; USAID and mSTAR, Digital Financial Services for Agriculture Guide, June 20, 2018, <https://www.usaid.gov/digitalag/documents/digital-financial-services-agriculture-guide>

Practical actions that IPs could take include: Assessing key barriers and enablers with their specific agriculture partners, and identifying relevant service providers and initiatives promoting DFS within the agriculture sector, including within specific agriculture value chains.⁶⁴ IPs could leverage this assessment and, where possible, identify ways to create linkages and partnerships to support the momentum demonstrated by the considerable uptake of digital payments during the pandemic.

- 7 Support creative solutions to get affordable mobile phones (at a minimum, basic phones) into the hands of market actors.** Market actors who had phones were better positioned to leverage digital services rapidly in the face of the market disruptions caused by COVID-19. However, access to even basic phones was still a challenge for some, especially women.⁶⁵

The benefits of investing in an approach to create viable initiatives for market actors to purchase quality, affordable phones are widespread. Ownership and use of mobile phones puts the power into the hands of market actors to better manage all stages of their agriculture transactions. Even a basic mobile phone can be an efficient tool that enables actors to respond rapidly and seize new opportunities, to maintain business relationships, to access a wide range of digital services, and to finalize payment transactions through DFS.

Practical actions that USAID could take include: Encouraging increased digital inclusion in program design, including activities that address barriers to mobile phone ownership.

Practical actions that IPs could take include: Identifying creative strategies to remove barriers and provide solutions that address the specific challenges to phone access and ownership, such as lowering the cost of phones, dividing up the payments into smaller, more affordable installments, expanding access to affordable phones, improving consumer confidence and skills to safely operate them, expanding awareness of relevant use cases, and tackling social barriers for women and girls.

Different types of financing and purchasing schemes help agriculture market actors procure mobile phones without relying on free distributions (which is not recommended). They include:

- **Device asset financing models** implemented as lease-to-own⁶⁶, layaway⁶⁷ or payment installment plans are made available through outgrowers, producer groups or agribusinesses that already sell equipment and inputs on similar plans, mobile phone vendors, or third-party providers such as pay-as-you-go utility companies.
- **Bulk purchasing options** coordinated in collaboration with stakeholders that can procure phones wholesale such as mobile network operators (MNOs), agriculture market actors such as outgrowers, or those who have a business case to sell quantities of bulk phones at a discount or wholesale price, and/or in installments.
- **Financial products** offered by relevant financial service providers that have or are willing to develop a mobile phone loan or savings-based product.
- **Shared or intermediary access models** in which farmers or market system actors can access mobile phones through intermediaries such as extension or mobile money agents equipped with mobile devices.

64 UNCDF, Digitalizing Rural Financial Ecosystems – Journey and Learnings from Digitalization of Dairy Value Chain in Nepal, January 7, 2021, <https://www.uncdf.org/article/6425/digitalizing-rural-financial-ecosystems---journey-and-learning-from-digitalization-of-dairy-value-chain-in-nepal>

65 See discussion of evidence of this in the Findings section.

66 A lease-to-own agreement is a deal in which one commits to leasing a device for a specific period of time, making payments at standard intervals (ex. weekly, monthly), with the option of purchasing it before the lease period ends.

67 Layaway is a purchasing agreement by which a retailer agrees to hold merchandise secured by a deposit until the price is paid in full by the customer.

This allows them to use digital services such as mobile money accounts and digital extension services without directly owning a phone. Further, in resource-constrained communities, shared asset models may also promote sharing of mobile devices between households or social groups such as Village Savings and Lending Associations (VSLAs) to facilitate group based transactions.

For more information on this topic, see the Expanding Mobile Phone Access and Ownership guidance document in [Annex 6](#).

Further practical actions that IPs could take include: Conducting user research and/or leveraging existing research to understand the barriers to phone ownership and use (e.g., social, infrastructure, cost, and literacy) and considering incorporating strategies to address these barriers as part of an activity. To ensure marginalized populations, such as women, can own and use phones, IPs should pay particular attention to identifying specific social or gender-related barriers that may need to be overcome.⁶⁸ Research findings can also reveal important information about barriers and where it may not be feasible for market actors or specific segments to own or access mobile phones (e.g., where network coverage is unavailable). Depending on the context, IPs could work to identify relevant approaches and creative strategies such as leveraging phones as shared assets (e.g., leveraging the phone of others such as agriculture extension agents or leaders in a producer group or VSLA), or ensuring that agriculture information and services are made accessible and/or promoted through other channels such as traditional digital media or face-to-face engagement.

8 Ensure risks are mitigated across all digital tools and services during the pandemic and beyond.

During the pandemic, many market actors started using digital tools to manage their agriculture activities. These new users may be unaware of the inherent risks associated with using digital tools, including the potential for cyberbullying, threats to cybersecurity, invasion of privacy, identity or data theft, fraud, misinformation, and various forms of harassment. This is especially challenging for the most vulnerable groups such as girls, women, and the elderly. USAID can play a critical role in educating users on how to protect their privacy, make informed decisions as consumers of digital services, and understand avenues for consumer recourse and how to use them.

Practical actions that USAID and/or IPs could take include: Conducting an assessment of the regulations and policies that exist within each country's specific jurisdiction that pertain to digital technology and consumer protection.⁶⁹ Such an assessment could also include identifying consumer protection advocacy groups and/or other entities engaged in informing consumers on these topics and/or providing digital skills education and training.

Practical actions that IPs could take include: Developing appropriate training guidance and curriculums, and conducting training for local agriculture market actors about potential risks and how to mitigate them.

68 C. Highet, et al., Can Free Phones Close the Digital Gender Divide? CGAP Blog, February 25, 2021, <https://www.cgap.org/blog/can-free-phones-close-digital-gender-divide>

69 Several key resources include: Principles for Digital Development, accessed March 2021, <https://digitalprinciples.org/resource/principle-8-address-privacy-security/> and USAID, Considerations for Using Data Responsibly at USAID, June 12, 2020, <https://www.usaid.gov/sites/default/files/documents/15396/USAID-UsingDataResponsibly.pdf> and World Bank, Global Financial Inclusion and Consumer Protection Data Catalog, accessed March 2021, <https://datacatalog.worldbank.org/dataset/global-financial-inclusion-and-consumer-protection>

Annex I: Stakeholders Interviewed

| USAID Mission Teams Including Feed the Future | |
|---|------------------|
| 1. | USAID/Bangladesh |
| 2. | USAID/Ghana |
| 3. | USAID/Guatemala |
| 4. | USAID/Kenya |
| 5. | USAID/Malawi |
| 6. | USAID/Nepal |
| 7. | USAID/Niger |
| 8. | USAID/Senegal |

| USAID Sector Experts | |
|----------------------|---|
| 1. | Senior Data Scientist, USAID |
| 2. | Team Lead, Digital Financial Services, USAID |
| 3. | Country Support Officer, USAID/RFS |
| 4. | Country Support Officer, USAID/RFS |
| 5. | Market Systems Specialist, USAID/RFS |
| 6. | Agricultural Development Specialist, USAID/RFS |
| 7. | Country Support Officer, USAID/RFS |
| 8. | Country Support Officer, USAID/RFS |
| 9. | Market Systems Specialist, USAID/RFS |
| 10. | Country Support Officer, USAID/RFS |
| 11. | Team Lead, Inputs Division, Technology Transfer Team, USAID/RFS |
| 12. | Country Support Officer, USAID/RFS |

| Key Implementing Partners Designated by the FTF Teams | |
|---|--|
| 1. | I2/I2 Alliance (Lutheran World Relief [LWR]), Niger |
| 2. | Agriculture Diversification Program (Carana), Malawi |
| 3. | Bangladesh Aquaculture and Nutrition Activity (Consultative Group on International Agriculture Research [CGIAR]), Bangladesh |
| 4. | Bangladesh Digital Agriculture Activity (DAI), Bangladesh |
| 5. | CSISA Mechanization and Extension Activity (CIMMYT/Bangladesh), Bangladesh |
| 6. | Dekkal Geej (Winrock), Senegal |
| 7. | FTF Bangladesh Livestock Production for Improved Nutrition Activity (ACDI/VOCA), Bangladesh |
| 8. | FTF Bangladesh Rice and Diversified Crops Activity (ACDI/VOCA), Bangladesh |
| 9. | FTF Coffee Value Chains Project (FEDECOCAGUA [Federation of Coffee Cooperatives]), Guatemala |

| | |
|-----|--|
| 10. | Innovative Solutions for Agricultural Value Chains (Popoyan), Guatemala |
| 11. | Kawolor (NCBA/CLUSA), Senegal |
| 12. | Kenya Crops and Dairy Market Systems (RTI), Kenya |
| 13. | KISAN II (Winrock), Nepal |
| 14. | Livestock Market Systems (ACDI VOCA), Kenya |
| 15. | Nafuore Warsaji (Connexus), Senegal |
| 16. | Nepal Seed and Fertilizer Project (CIMMYT), Nepal |
| 17. | PIATA (AGRA), Ghana |
| 18. | Sustainable Fisheries Management Project (Coastal Resources Center, University of Rhode Island), Ghana |
| 19. | Titukulane Program (CARE), Malawi |
| 20. | Yalwa (CNFA), Niger |

International Development Programs and Government Working in this Sector

| | |
|----|--|
| 1. | Grameen Foundation |
| 2. | Mercy Corps Agrifin Program |
| 3. | Agence Nationale pour la Société de l'Information, Niger |

Private Sector Service Providers

| | |
|-----|----------------------------|
| 1. | Bangladesh SME Corporation |
| 2. | Digital Green |
| 3. | Farmerline |
| 4. | Jokalante |
| 5. | Juhudi Kilimo Ltd MFI |
| 6. | Mediae Company |
| 7. | Mkulima |
| 8. | mPower Social |
| 9. | MyAgro |
| 10. | New Path |
| 11. | One Acre Fund |
| 12. | Opportunity International |
| 13. | TICAalyse |
| 14. | TROTRO Tractor Limited |

Local Agriculture Market Actors

| | |
|----|--|
| 1. | Club Toissane |
| 2. | Ghana National Canoe Fishermen's Council |
| 3. | Goshen Farm Exporters Limited |
| 4. | Mkulima Young |
| 5. | National Fish Processors and Traders Association |
| 6. | NASFAM |
| 7. | Producers Direct |
| 8. | Rana Hilendra |

Annex 2: Interview Guide

The following is a list of questions used to guide the interviews, though questions would have been adapted depending on the type of stakeholder being interviewed.

1. Since the pandemic, what digital tools and services have emerged to support agriculture market actors in response to the challenges of the pandemic?
 - a. Or how have your programs used digital tools and services?
 - b. Or what digital tools and services have you offered as a service provider?
2. Are these new digital tools and services?
 - a. Or existing digital tools and services that were adapted?
 - b. Or pre-existing tools and services that are just finally being adopted because they are seen as useful/necessary now?
3. Are there IPs or service providers or agribusinesses that you think we should consult?
4. Are these new digital tools and services likely to endure after COVID-19?
 - a. Why or why not?
5. What are challenges agriculture market system actors face in adopting these specific digital tools or services ?
 - a. Are the challenges the same as before COVID-19?
 - b. Are there new challenges to adapting digital tools?
 - c. Are these challenges unique to specific groups of actors? (e.g., farmers, other VC actors, already marginalized, women)
6. What are the enablers to adoption of these new digital tools and technologies that address COVID-19?
 - a. Are these unique to or shared by specific groups of actors? (e.g., farmers, extension agents, VC actors, already marginalized)
7. How can these agriculture market system actors be assisted to acquire technical skills and capabilities to adopt these digital tools and services?
 - a. by USAID
 - b. by IPs/development organizations (local, international)

Annex 3: Key Resources Consulted

Below are selected resources consulted.

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Annex 4: E-Commerce Marketplaces

E-COMMERCE MARKETPLACES

| The Challenge | The Solution |
|---|--|
| COVID-19–related restrictions have forced agriculture market actors to find alternatives to substitute in-person interactions and transactions. While these actors were forced to find new ways to connect with buyers and sellers, households, especially those in urban areas, faced lockdowns that required them to find new ways to purchase everything from meat and produce to household goods. Also, food delivery service providers faced dramatic losses as restaurants closed and the tourism sector dramatically shrunk. | E-commerce marketplaces allow market actors to sell agriculture products with added benefits such as speedier service to customers, which reduces spoilage, and the opportunity to reach more customers than previously possible through traditional channels. Though e-commerce marketplaces are not new, many such marketplaces expanded in response to COVID-19 restrictions and adapted to customer needs, adding fresh produce to their offerings and shifting their focus from business clients to consumers. Some market actors even created their own e-commerce marketplaces to reach old and new customers alike. Market actors are also pursuing additional economic opportunities with e-commerce platforms by offering marketplaces services such as logistics, storage, and packaging. |

What are E-commerce Marketplaces?

E-commerce marketplaces are digitally enabled platforms that connect multiple buyers and sellers, allowing buyers to search for products and purchase them online.

These marketplaces are diverse in that they can be large platforms that offer products across several sales categories, such as [Jumia](#), which has gained a large footprint in sub-Saharan Africa, or focus only on specialized categories, such as India's [BigHaat](#), which specifically focuses on agricultural inputs. While technology companies own most of these platforms, some are run by agribusinesses and other private enterprises or associations. Most of

these services are under five years old, operate in only one country and, particularly in the agriculture sector, serve fewer than 100,000 producers. During the COVID-19 pandemic, many marketplaces have grown dramatically and show no signs of waning as a way for market actors to buy and sell products. While e-commerce marketplaces are growing in Asia (especially India and China), growth is slower in sub-Saharan Africa, partially due to high transaction costs related to transport and delivery.



Credit: John O'Ruan/ISAID

How do E-commerce Marketplaces Work?

E-commerce marketplaces generally follow one of two approaches. The first is similar to the Amazon model where any buyer can search for a product from various sellers that are aggregated on one platform. This is the most common approach. In the second approach, the e-commerce marketplace serves as a digital umbrella over each vendor's small "shop," allowing buyers to search within individual shops, but not across them. While farmers or farmer groups may manage their own e-commerce accounts, in some instances, there are intermediary models where marketplaces such as KhetiFood aggregate farmer produce to sell on their platform. Kheti also aggregates farmer produce to sell to other marketplaces such as groDeli.

"There is a new generation that is changing habits...Both men and women work now, so I'm confident Senegalese people will remain interested in our services." -

Representative, Club Tiossane, a new food e-Commerce marketplace in Senegal regarding the consumer shift to convenience.

Marketplaces can specialize in specific product areas, such as groceries, or sell a variety of products and services, such as agricultural inputs and advisory or financial services. Marketplaces can also specialize in serving business customers through a business-to-business (B2B) approach, or focus on consumers (business-to-consumer, or B2C). During the pandemic, some marketplaces shifted to a B2C focus because their target business customers closed, as was the case with many tourism-related businesses. Some governments, such as those in [Senegal](#) and [Bangladesh](#), set up their own government-led e-commerce platforms to help buyers find small businesses, including agribusinesses, sell their goods online. Government support for e-commerce is also building in countries like Rwanda, which released a [National E-Commerce in Agriculture Value Chains Strategy](#) in April 2021.

Marketplaces usually make money by taking a small fraction of each transaction as a commission, which is easier to facilitate if they accept digital payments. If digital payments are not accepted, cash payments are made at the time of delivery, making it much harder for the marketplace to collect a portion of the transaction. As such, the marketplace may have to charge subscription or service fees. Also, some marketplaces handle delivery directly to the consumer while others deliver to stores or convenient collection points. In areas with poor roads or unclear street signs, logistics can be more challenging, which in turn can affect delivery costs.

[Women in E-Commerce \(WE\)](#) in Bangladesh helps women gain from e-commerce marketplaces by creating awareness around e-commerce platforms, offering a platform for peer learning and networking, and nurturing female entrepreneurs through trainings and certificate courses. Though not exclusively focused on agriculture, WE is an example of how to support women entrepreneurs to better leverage e-commerce marketplaces.

Why Should You Consider E-commerce Marketplaces?

E-commerce marketplaces can enable agriculture market actors to reach new customers or gain access to existing customers more efficiently. If producers can meet an e-marketplace's product standards, they can reduce post-harvest loss by securing buyers in a more timely manner and potentially selling higher volumes. Farmers also have the potential to earn more through premiums for high-quality produce and good customer ratings. Finally, these marketplaces can introduce intermediary services, such as logistics, packaging, and storage, to better facilitate transactions between buyers and sellers, and reduce the burden on small suppliers.

When Are E-commerce Marketplaces Likely Not the Right Fit?

As in all digital interventions, Missions and implementing partners must carefully determine whether factors

such as limited access to and use of mobile phones, poor digital literacy, lack of trust in digital tools, laws or regulations, or other social constraints may negatively affect the impact of e-commerce marketplaces. Connectivity and access are a primary barrier. Without access to reliable Internet and digital devices, farmers are less able to consistently sell their goods online. Also, poor infrastructure and/or logistics networks may inhibit the ability of farmers to effectively sell online. In these instances, e-commerce marketplaces may not be the right fit for all farmers. Also, if farmers already have good relationships with reliable customers who pay them fairly and reliably for the quality received, they have little incentive to change their existing selling practices. The risks of abandoning this traditional format for a new means of selling, especially when the sustainability of the e-marketplace is unknown, may outweigh the benefits.

What Are Some of the Potential Risks and Pitfalls of E-commerce Marketplaces?

Producers can lose sales channels if they shift to an e-commerce marketplace. They may also face more competition because buyers can look to e-commerce marketplaces to find cheaper, better, or more convenient farm products. Also, e-commerce marketplaces may prove to be fickle customers, shifting to other producers to save money or time, increase reliability, or lower prices they are willing to pay. E-commerce marketplaces may also distract farmers from establishing or improving existing, and already efficient, buyer/seller arrangements with large buyers willing to pay for quality and timeliness.

Some farmer groups and development actors may try to create their own e-commerce marketplaces. This is a risky effort requiring strong entrepreneurial business and technical skills as well as a viable sustainability model informed by market dynamics. In most situations, farmer groups and implementing partners are not best equipped to properly develop and manage these marketplaces and, as a result, the risk of failure is high. A less complicated digitally enabled solution, such as social media, or an existing marketplace may work just as well with equal or higher gains.

Finally, farmers who are unable to sell their goods through e-commerce marketplaces risk being left behind or losing out on opportunities to expand their sales channels and customer bases. Often, those that face the greatest obstacles in accessing and using digital tools are marginalized populations, such as women and people with disabilities. As a result, moving agricultural marketplaces and transactions online can exacerbate this economic divide.

Illustrative Examples

- [KhetiFood](#): KhetiFood, operated by DV Excellus, is an e-commerce marketplace in Nepal that had strong ties to farmers before it set up its e-marketplace. Its marketplace focused first on selling produce to B2B customers, then shifted during the pandemic to B2C customers. Because of its links to farmers, it provides packaging and grading services for farm produce to at least one other e-commerce marketplace.
- [Fruitee-Kenya](#): Fruitee-Kenya is an e-commerce marketplace selling dried fruit snacks to consumers. It is operated by [Goshen Farm Exporters Limited \(GFE\)](#), a family business that grows, processes, and also exports agricultural products it grows or buys from local farmers.
- [mKulima Young](#): mKulima Young is an agriculture-focused e-commerce marketplace in several African countries that sells fresh produce to consumers. It offers optional transportation services and also allows buyers to post what they are looking for, when needed, how much is needed, the buyer's location, and optionally, the buyer's price.
- [Nyarkadera-Easygro](#): Nyarkadera-Easygro is a Kenya-based e-commerce marketplace for agricultural inputs and equipment. It accepts payment through digital money (M-PESA), cash, or credit.

- [Kaomini](#): Kaomini is an e-commerce marketplace operated by the government postal service in Niger. It offers digital storefronts for sellers and sheep for sale among many other items. Digital payment is optional.
- [Facebook Marketplace](#): Popular social media platforms such as Facebook and Instagram are increasingly becoming more common as e-commerce marketplaces. For example, Des Legumes Frais operating in Senegal uses Facebook Marketplace to sell fresh produce.

ACTION CHECKLIST

| | |
|---|---|
| 1 | <p>Conduct a Market Assessment: Start by collecting relevant market information on the context, demand, and supply for e-commerce marketplaces in your country of operation. USAID should leverage existing data when possible and/or commission research to inform the identification of relevant e-commerce marketplaces. Research should achieve the following:</p> <ul style="list-style-type: none"> • Determine the current state of agricultural transactions across the market system or along a specific value chain, specifically noting gaps and challenges such as pandemic- related disruptions, poor market linkages, and other market system inefficiencies. • Assess the current availability and popularity of e-commerce marketplaces in the country of operation. Focus on assessing whether Feed the Future priority value chains are included in the marketplaces (i.e., grains, livestock, fresh produce). Explore the International Trade Centre's e-commerce portal and, if in Africa, see what e-commerce marketplaces are listed in its database. Make sure to consult local stakeholders, such as agribusinesses, to better understand how well these marketplaces operate. • Research other solutions that may be more viable. If you find that there are other successful and sustainable transaction channels and/or challenges to operating an e-commerce marketplace, such as connectivity and mobile penetration, then pursuing e-commerce marketplaces may not be the right solution. |
| 2 | <p>Test and Engage Existing E-commerce Marketplaces: If the market assessment reveals that promising e-commerce marketplaces are available that can meet the needs of market actors, proceed with testing the capabilities of each platform and engage the platform operators to better understand how they work.</p> <ul style="list-style-type: none"> • Evaluate such factors as: the type and volume of agricultural products available on the platforms, the number of sellers, usability for the sellers and buyers, and branding of the marketplace. • Engage with e-commerce marketplace operators to better understand trends they are seeing in the market. It's also important to learn the business model and any challenges they are facing that market actors might help solve (e.g., storage or transport). |
| 3 | <p>Organize Stakeholder Meetings to Gather Consensus: Once steps 1 and 2 are complete, organize a stakeholder meeting that brings together key market actors, such as farmer groups, agribusinesses, buyers, implementing partners, digital service providers, key digital experts, and other donors to share learnings and gather consensus around the viability of leveraging e-commerce marketplace solutions. Such stakeholder meetings could be an opportunity to link farmer groups and other market actors to promising e-commerce solutions and identify next steps for further support and facilitation.</p> |
| 4 | <p>Take Action to Leverage E-commerce Marketplaces to Benefit Farmers and Other Market Actors: If step 3 successfully gathers consensus around leveraging e-commerce</p> |



| | |
|---|---|
| | <p>marketplaces, you can take action to support both the marketplaces themselves and farmers and other market actors.</p> <ul style="list-style-type: none"> • Partner with an e-commerce marketplace operator to build its capacity and sustainability through activities such as expanding its reach to more farmers and market actors, improving the user experience for buyers and sellers, and/or adapting the business model. • Provide support to farmers and other market actors interested in using e-commerce marketplaces through assistance developing action plans, conducting risk assessments, running cost analyses, and offering training as needed. |
| 5 | Revisit steps 1–4 and evaluate your progress often, as e-commerce marketplaces are quickly evolving. |

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Annex 5: Farmer Management Solutions

FARMER MANAGEMENT SOLUTIONS

| The Challenge | The Solution |
|---|--|
| Due to COVID-19 restrictions prohibiting face-to-face meetings and other information-sharing channels, agriculture market actors have experienced challenges in the quality and flow of information to their various farmer groups and cooperatives. Challenges include sharing timely and accurate updates to help combat misinformation and disinformation, providing advice on reliable sources for assistance, and efficiently organizing members to buy inputs and sell outputs. | Farmer groups are leveraging farmer management solutions to facilitate digital communication between members, dispel misinformation and disinformation, share updates on market and border closures, and more. These solutions have also helped farmers distribute emergency food assistance, access financial services, aggregate demand to purchase inputs, and sell off harvests. |



What are Farmer Management Solutions?

Farmer management solutions are digitally enabled applications operated by a farmer group, cooperative, or related agribusiness (e.g., buyer, seller, service provider). These solutions provide farmer groups with a range of services that vary in complexity, but are typically built upon a database that holds basic information on individual farms or households. These data typically include their identification, location, plot size, contact information, a list of the crops they grow, and sometimes more detailed information such as their yield or loan history and the variety of seeds they use. Depending on the services a farmer group provides to its members, the solution may also collect group-level information such as services used by members, products sold by the group, inputs purchased, loans made, yields across farmers, and information on input providers and buyers.



Credit: Riaz Jahanpour for USAID/Digital Development
Communication

At the beginning of the pandemic, stay-at-home orders began quickly and with little notice. This left little time for farmer groups and agribusinesses to equip farmers with the information they needed to continue farm production and access services. Farmer management solutions allowed these organizations to quickly contact and organize farmers, while enabling remote access to services.

How Do Farmer Management Solutions Work?

Farmer management solutions have various capabilities. First, they allow members to sort farmers by different characteristics, such as location or crops grown. This allows the farmers to receive information, such as advisory services, market prices, or weather updates sourced from a third party that are unique to their specific profile. The solutions are also used to manage services provided by the farmer group or agribusiness, such as aggregating input orders or yields, facilitating buyer arrangements, and providing access to mechanization, storage, and transportation. Another key component is that farmer management solutions can be used to facilitate the delivery of financial services such as loans or crop insurance from the farmer group itself or from a financial services provider.

Farmer management solutions vary by who owns and operates the application, how the solution is designed, and whether the group works with field agents. Many farmer management solutions are used directly by field agents who deliver services and are responsible for updating farmers' information in the system. Also, some solutions have modules that allow farmers to directly input their own information and view their farm data through a linked smartphone application.

Farmer management solutions owned and operated by agribusinesses that buy from, sell to, or provide services to farmers are the most common. Some of these solutions are built on core software, such as [Dimagi's CommCare](#) or [Taroworks](#), which operates through field agents. Farmer management solutions operated by farmer groups themselves without donor support are relatively rare due to sustainability challenges related to financing, operations and maintenance. However, groups can use a growing number of low-cost digital tools, such as templates for shared spreadsheets, shared digital file capabilities, and mapping applications. Two examples of farmer-owned and operated farmer management solutions, both fostered by USAID Feed the Future projects, are noted in the illustrative examples below.

Why Should You Consider Farmer Management Solutions?

Smallholder farmers can gain many benefits from having direct or indirect access to a farmer management solution. Depending on the range of modules available, member farmers can efficiently access time-sensitive updates and alerts, receive extension services, find better inputs, and reach existing and new customers. As a group, farmers can efficiently access mechanization and other services, such as post-harvest processing, storage, and transportation, and reduce crop loss. Farmers can even collectively negotiate higher prices for their goods by using the solution to meet buyers' demands for volume purchases, handle transactions faster, and take advantage of group storage or transport. They may also be able to increase their earnings by using the solution to introduce good agricultural practices and identify buyers willing to pay a premium for quality and timeliness. Finally, some farmer management solutions track a farmer's yield history, which can be used as one factor to help determine creditworthiness. This in turn can increase farmers' access to financial services needed to manage a household between crop cycles, withstand unforeseen pandemic-related disruptions, and maintain resilience to shocks.

“It is important to avoid the development of “black box” solutions whereby producers are passive users. Instead, systems should be developed that facilitate access to their [the producers'] own data and thus develop their capacity for analysis...”
([Data Driven Agriculture](#), USAID Feed the Future Senegal Nataal Mbay, Cereal Value Chains, 2019, p. 11.)

A farmer management solution can increase resilience because it can deliver information to help farmers quickly address unanticipated challenges (such as about closed borders or markets) and facilitate actions to solve problems related to accessing inputs, services, customers, or emergency aid. These benefits can lead to

reduced costs and increased productivity for individual farmers. For example, aggregating demand for inputs can lower costs and even increase productivity, since input providers have a stronger incentive to make timely deliveries for optimal application of inputs aligned with the crop cycle, improving the precision of agronomic practices that can lead to higher yields. In the context of COVID-19, farmer management solutions were also used to disseminate accurate information about the pandemic and combat misinformation and disinformation. For example, [Farmerline](#) in Ghana leveraged its solution to quickly disseminate COVID-19 facts to farmers, while also disbursing credit to its input suppliers. Further, during the pandemic, the Senegal Farmer Network quickly provided information to members on government financial aid and informed members how to partially shift to growing crops that could feed families when markets were hard to reach.

When Are Farmer Management Solutions Likely Not the Right Fit?

As in all digital interventions, Missions and implementing partners must carefully determine whether factors such as limited access to and use of mobile phones, poor digital literacy, lack of trust in digital tools, laws or regulations, or other social constraints may negatively affect the impact of these farmer management solutions. If, for example, mobile phone coverage is poor, many member farmers will not be able to reap the anticipated benefits. In this case, a farmer management solution may not be appropriate. However, to address these factors, the solution can adapt to incorporate digitally enabled agents or extension officers, or include offline capabilities that allow farmers to use the solution even when not connected to a network.

What Are Some of the Potential Risks and Pitfalls of Farmer Management Solutions?

Farmer management solutions come with some potential risks. If governed poorly, the group's management can use the solution for its own gains, benefiting from pricing and market information while members' benefits are diminished or nil. With much of a farmer's data in digital form, data rights and data privacy could be violated, especially if the farmer or service provider does not understand how to protect their data. Finally, if a solution is adopted with donor funding without a viable plan for financial and organizational sustainability beyond a funded project, it may be abandoned, meaning the investment of time and effort in such a system—as well as the data—may be lost.

Illustrative Examples

- [Senegal Farmer Networks](#): This program supports 150,000 producers through field agents and database managers. It provides a wide range of services, including advice, aggregation of inputs and outputs, mechanization services, and access to finance. A digitally enabled farmer management solution, the program was facilitated by USAID Feed the Future Senegal's (FTF) Nataal Mbay Cereal Value Chains Project. It combines—among other components—simple Microsoft Excel templates, software to map plots, and a third-party weather service. See the reference list for more on this solution.
- [OB Networks of Ghana](#): This network includes 10 outbuyer farmer networks, each with dozens of outbuyers supporting over 27,000 smallholder farmers. The networks provide a wide range of services to outbuyers and smallholder farmers, including input provision, mechanization services, shelling services, and sales assistance. Many of the networks use a digitally enabled farmer management system to manage their operations and service delivery through field agents with a suite of digital tools, simplified at the end of the USAID FTF Agriculture Development and Value Enhancement (ADVANCE) II Project.

- **AgriConecta:** Part of the FTF [Proinnova Project](#) in Guatemala, AgriConecta is managed by Popoyan, a large agribusiness. It supports 2,500 farmers now with plans to expand to 22,500 farmers with a wide range of services. So far, the solution helps farmers purchase inputs from local suppliers and also provides crop advice. The solution plans on providing post-harvest services such as storage, transport, and processing, as well as financing. Popoyan benefits from this solution by having a well-organized group of producers from whom to buy products, using quality inputs and good farming techniques. Simultaneously, farmers may benefit from increased productivity, easy access to inputs and services, and reduced losses because they can sell faster in large quantities.
- **Cooperative Management System:** Cargill's management system for cocoa farmers is an example of a buyer-owned farmer management solution designed to be "win-win." Cargill gains by being able to prove to customers that it sells sustainable products where workers are treated well, and farmers gain by receiving access to loans, learning to better manage their cooperatives, and learning sustainable growing practices and ways to [increase productivity](#).
- **MyAgro and One Acre Fund:** These service providers illustrate two other examples of farmer management solutions. They use their solutions to deliver services to farmers as well as to collect farmer information. Some may argue these go beyond farmer management solutions to service delivery or responsible sourcing.
- **Messaging Applications:** Beyond the farmer management solutions listed above, messaging and social media applications such as WhatsApp, Facebook, and Signal have emerged as informal approaches for farmers to manage and communicate among themselves and with other market actors during the pandemic. For example, farmer groups such as the [National Smallholder Farmers' Association of Malawi \(NASFAM\)](#) used WhatsApp to maintain communications with member farmers and buyers. Also for the first time, buyers initiated negotiations through WhatsApp by requesting farmers to send photos of their produce to help strike deals.

Note: The Agribusiness Market Ecosystem Alliance (AMEA), consisting of 22 members including several USAID implementing partners and development donors, tracks farm group management solutions. Check out AMEA's annual [Agricultural Technology Guide](#) with many solution profiles and a list of ag-tech companies to know.

ACTION CHECKLIST

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| I | <p>Conduct a Landscape Assessment: To determine if and how farmer management solutions can help address market disruptions in one's country of operation, a landscape assessment is needed that takes into account the current ecosystem of farmer groups and cooperatives, and their existing use of digital tools. This assessment should also aim to capture what farmer management solutions are already available in the marketplace and may meet the needs of these groups. Research should achieve the following:</p> <ul style="list-style-type: none"> • Determine the current landscape of farmer groups in the target market system, including their size, how they are organized and by whom, the group's structure, number of members, value chains represented, and services rendered to members. • Once farmer groups have been identified, evaluate their challenges and needs in terms of communicating with, coordinating, and delivering services to members. • Evaluate current use of digital tools and farmer management solutions in particular. This evaluation should capture groups' experiences using such solutions. This can include operational information such as who operates the tools (the farmer group or an external |
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| | <p>enterprise) as well as members' perceptions of the tool.</p> <ul style="list-style-type: none"> Beyond the solutions named by farmer groups, identify other farmer management solutions currently available on the marketplace that may serve farmer groups based on needs identified in the assessment, paying special attention to details around data management and ownership. |
| 2 | <p>Organize Stakeholder Meetings to Share Findings and Gather Consensus: Organize a stakeholder meeting that brings together key market actors, such as farmer groups, agribusinesses, buyers, digital service providers, farmer management solution providers, key digital experts, and other donors, to share learnings and gather consensus on the viability of leveraging farmer management solutions. Consider organizing a separate presentation to head farmers or the farmer organization to share findings from the assessment and information about farmer management solutions, how they work, and the potential benefits of using them.</p> |
| 3 | <p>Take Action to Leverage Farmer Management Solutions: If based on the stakeholder meetings, farmer management solutions are determined to be a viable solution, you can take action to help farmer groups leverage these tools and support the expansion of solution providers.</p> <ul style="list-style-type: none"> Consider providing support to help groups estimate the costs, benefits, opportunities, and risks associated with using farmer management platforms, determining which services would be most cost effective and of greatest relevance to identified needs. If following this assessment, they still want to proceed, encourage them to prepare a concrete action plan, including following the Principles of Digital Development, plans for financial and organizational sustainability, data management, and risk mitigation. Consider partnering with a farmer management solution provider or agribusiness offering similar solutions to build its capacity and sustainability through activities such as expanding its reach to more farmers and market actors, improving the user experience for users, and/or adapting the business model. |
| 4 | <p>Disseminate Knowledge: Monitor the progress of those farmer groups that decide to leverage farmer management solutions, as well as other similar solutions available in your country or region. Consider presenting a brown bag seminar on the topic to others at the Mission or to implementing partners, farmer groups, and other donors.</p> |

Key References:

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- Data-Driven Agriculture*, USAID Feed the Future Senegal Nataal Mbay, Cereal Value Chains, 2019. Describes the relatively simple digital tools used by Senegal's farmer networks. Here is more information on this farmer group management solution's design and use: a [video](#) and a [case study](#).
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Annex 6: Expanding Mobile Phone Access and Ownership

EXPANDING MOBILE PHONE ACCESS AND OWNERSHIP

| The Challenge | The Solution |
|--|--|
| During the pandemic, mobile phones emerged as a critical tool in helping agriculture market actors respond to market disruptions. Basic feature phones and smartphones alike helped actors access vital information and advisory services, negotiate deals, locate inputs, hire labor and mechanization services, aggregate produce, and hire transport to markets. Unfortunately, many market actors still do not own mobile phones ⁷⁰ for a variety of reasons, including inadequate literacy and digital skills, lack of trust in digital devices, limited knowledge of relevant use cases, poor connectivity, lack of identification documents to register for mobile phone subscriptions, social constraints (particularly for women), and notably, a lack of affordability. ⁷¹ | To expand access to mobile phones and increase mobile phone ownership, USAID and its implementing partners should consider creative strategies, such as asset financing models, bulk purchasing, installment payment plans, secure shared devices, and partnering with the private sector to subsidize phones and financial products. These solutions can remove barriers by lowering the cost of phones, dividing up payments into smaller and more affordable installments, and expanding access to financing for affordability. |



What are some strategies to expand mobile phone access and ownership?

Various approaches can be used to expand mobile phone access and ownership without relying on free distribution. For example, mobile phone financing plans enable market actors to access more affordable phones through better pricing, more manageable payment installments, and/or financial products that can be used to save for or secure credit toward the purchase of a phone. Also, strategies such as promoting shared devices can help expand access to digital tools and services in resource constrained communities where mobile phone access or availability remain low.



Credit: Riaz Jahanpour for USAID/Digital Development Communication

70 At the end of 2019, 14 percent of adults in low-middle income countries (LMICs) did not own any type of mobile phone; in South Asia and Sub-Saharan Africa, more than 20 percent of adults do not own a mobile phone. Affordability of handsets remained the top reported barrier to mobile ownership in many LMICs in 2019. GSMA State of Mobile Internet Connectivity Report, 2020, <https://www.gsma.com/r/wp-content/uploads/2020/09/GSMA-State-of-Mobile-Internet-Connectivity-Report-2020.pdf>

71 Women across LMICs are 8 percent less likely than men to own a mobile phone. GSMA Mobile Gender Gap Report, 2020, <https://www.marketlinks.org/resources/mobile-gender-gap-report-2020>

How do these strategies work?

- **Device asset financing models** implemented as lease-to-own,⁷² layaway,⁷³ or payment installment plans are made available through outgrowers, producer groups, or agribusinesses that already sell equipment and inputs on similar plans, mobile phone vendors, or third-party providers such as pay-as-you-go utility companies.
- **Bulk purchasing options** are coordinated in collaboration with stakeholders that can procure phones wholesale such as mobile network operators (MNOs), agriculture market actors such as outgrowers, or those who have a business case to sell quantities of bulk phones at a discount, wholesale price, and/or in installments.
- **Financial products** may be offered by relevant financial service providers that have or are willing to develop a mobile phone loan or savings-based product.
- **Shared or intermediary access models** help farmers or market system actors access mobile phones through intermediaries such as extension or mobile money agents equipped with mobile devices. This allows them to use digital services such as mobile money accounts and digital extension services without directly owning a phone. Further, in resource-constrained communities, shared access models can promote sharing of mobile devices between households or groups such as Village Savings and Lending Associations (VSLAs) to facilitate group-based transactions.

Why should you consider expanding mobile phone access and ownership?

Mobile phone ownership can help empower market actors with tools to continue their agriculture activities earn income and build resiliency in the face of shocks such as the COVID-19 pandemic. Some use cases include maintaining critical relationships within the agriculture market system, expanding their customer base and marketing channels, accessing vital information for decision-making, conducting remote transactions, and using digital financial services. The strategies to expand mobile phone access and ownership listed above create value for market actors by providing better pricing and more manageable payment plans for devices, while simultaneously creating new business opportunities for agribusinesses or financial services providers interested in financing mobile devices as an additional product or service line. Despite these opportunities and the proliferation of cheap smartphones in particular, Missions and implementing partners should exercise caution when increasing access to affordable phones. Specifically, they should consider the risks associated with increasing access to phones that, due to their make and model, have various compatibility issues that could negatively impact market actors' access to current mobile-based digital services.

“There are some cheap smartphones available here in Niger. It’s surprising - you may think someone with limited resources cannot afford it, but some will acquire it and pay overtime. There are creative ways for people to get one.” - **Representative, National Agency for Information Society (Agence Nationale pour la Société de l’Information, ANSI)**

When are mobile phone access and ownership expansion strategies likely not the right fit?

Mobile phone ownership expansion strategies may not be appropriate to pursue if the target population does not have access to the foundational infrastructure needed to support mobile phone use (i.e., a strong telecommunications network). Also, it may not be appropriate to expand financing-related schemes if initial assessments or surveys on current use and interest in mobile phones reveal barriers unrelated to affordability.

⁷² A lease-to-own agreement is a deal in which one commits to leasing a device for a specific period of time, making payments at standard intervals (e.g., weekly, monthly), with the option of purchasing it before the lease period ends.

⁷³ Layaway is a purchasing agreement by which a retailer agrees to hold merchandise secured by a deposit until the price is paid in full by the customer.

As in all digital interventions, Missions and implementing partners must carefully determine whether factors such as poor digital literacy, lack of trust in digital tools, laws or regulations, or other social constraints may negatively affect the impact of these strategies.

What are some of the potential risks and pitfalls of expanding mobile phone access and ownership?

Strategies to expand mobile phone ownership must be implemented based on thoughtful research and planning with consideration of the potential risks or negative impact on market actors. Some risks include market actors becoming over-indebted when purchasing phones. If purchasing schemes are not appropriate, they may cause negative impacts on household income or disrupt household dynamics if certain actors who obtain phones do so in contradiction of social norms. Also, establishing financing schemes without a clear business case may result in market actors investing in a business that is not viable and could result in loss of finances, reputation, and/or customer loyalty. Finally, when promoting shared devices, multiple users face an elevated risk of harm if the device is lost or stolen, or if personal account information or data are compromised due to human error or efforts from malicious actors.

Illustrative Examples

- [Juhudi Kilimo Ltd. \(JKL\)](#): JKL is a microfinance institution (MFI) in Kenya that provides financial services to approximately 47,000 rural smallholder farmers and a number of micro entrepreneurs (mainly agribusinesses). JKL offers a variety of loans, including those designed for agriculture assets. In March 2020, before the onset of COVID-19, JKL launched a mobile phone loan product called “Simu Yangu,” which means “My Phone” in Kiswahili. The maximum loan amount is approximately \$15 USD, which is meant to be repaid monthly within six months. JKL believes it is important to “bring their clients into the digital era.” It recently transitioned to using linked [M-PESA](#) mobile money wallets for loan collections, savings deposits, and disbursement of emergency digital credit, thus making the phone a valuable tool for both JKL and the clients, especially during the COVID-19 market disruptions. So far, most of the loans have been taken by women.
- [Strategic Impact Advisors](#) and [TNM](#): With funding from the Foundation for a Smoke Free World in Malawi, this project conducted training for 1,000 smallholder farmers (SHFs) on mobile money use cases. Initially, approximately 50 percent of farmers did not own a mobile phone, so an arrangement was made with TNM, the mobile network operator, and two local farmer-based organizations to craft a solution. TNM sold basic mobile phones (costing about \$11 USD) to the SHFs on an installment plan that spread the payments for the phones over three equal monthly installments, which was a more manageable outlay of costs for the SHFs. Payments were collected by lead farmers who deposited the funds with the farmer-based organization for repayment to TNM. TNM sold 346 phones through this installment plan scheme, increasing mobile phone penetration by 25 percent among the SHFs being trained.
- [The ADVANCE II Program](#): The ADVANCE II Program operated an outgrower business model in Ghana promoting commercially focused linkages between actors that both supply and purchase from smallholder farmers. The program aimed to incorporate a range of digital services for operations (e.g., mobile data collection), extension and information delivery (e.g., voice messaging service), and financial inclusion (e.g., digital financial services). However, in their activity areas, mobile phone ownership was only at 33 percent of the overall population (49 percent for men, 19 percent for women). To address this challenge, ADVANCE II worked directly with mobile network operators to sell low-cost phones in the communities. Unexpectedly, sales were limited to harvest times when farmers had a bit of extra

income to make such purchases. In this case, it would have been helpful to also explore payment installment options rather than expecting farmers to pay all in one lump sum.

- Advanced Chemical Industries Limited (ACI):** ACI is one of the largest conglomerates in Bangladesh. One of its strategic business units is ACI Agribusinesses, which integrates services on agriculture, livestock, fisheries, and farm mechanization. It also has the ACI retail chain, [SHWAPNO](#), which operates 129 outlets across the country and an online marketplace. ACI is implementing a project with 600 farmers to promote best agriculture practices and purchase their outputs for sale at SHWAPNO. During the pandemic, ACI subsidized 70 percent of the cost of smartphones for its long-term farmers (those that have worked with ACI for five or more years). This scheme was deemed necessary to maintain communications, provide agriculture advice, and conduct transactions as the organization had no choice but to connect with farmers virtually. As an investment in better supply chain management, the phones were purchased in bulk and made available to farmers who paid for the devices through deductions from their bills to ACI. The organization found this approach beneficial and expects it to reduce supply chain costs in the long run.

ACTION CHECKLIST

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| 1 | <p>Conduct a Market Assessment: With the goal of creating user-centric and viable solutions, it is necessary to start with relevant market information on the context and the demand and supply for mobile phones. USAID should leverage existing data when possible and/or commission research to inform the identification of relevant mobile phone financing solutions. Research should include:</p> <ul style="list-style-type: none"> • Demand-side information: mobile phone use in country and by specific market actors in the areas where USAID works, their preferences, barriers, and risks to phone ownership (disaggregated by gender and other demographics). • Supply-side information: a landscaping of mobile network operators, main mobile phone suppliers, relevant financial service providers, other third-party providers (e.g., pay-as-you-go solar devices), and cost and quality of devices available. • Environment: infrastructure for operating mobile phones such as connectivity (e.g., network coverage) and electricity, and requirements for registering for a mobile phone subscription (e.g., Know-Your-Customer identification requirements). |
| 2 | <p>Explore Potential Mobile Phone Uptake Schemes: Based on the specific market context and agriculture market actors' needs and preferences, USAID should encourage implementing partners to explore various opportunities and partnerships for appropriate mobile phone uptake schemes. In each scheme, it is critical to identify and cultivate partnerships with relevant stakeholders, such as mobile network operators, financial service providers, and other mobile phone vendors, and collect relevant detailed information to demonstrate a business case for the scheme. The preferred scheme will depend on the specific context, willing partnerships, and market actor preferences. Before meeting with a potential partner, be sure to prepare as follows:</p> <ul style="list-style-type: none"> • Do not expect or seek donations or see this partnership as solely a corporate social responsibility initiative. There must be a viable business proposition to discuss with the potential partner. • Be prepared to have an informed conversation. Study the partner's current activities, business goals, and incentives, and consider what value proposition a mobile phone uptake scheme might offer. <ul style="list-style-type: none"> ◦ Does the potential partner sell mobile phones? In bulk? For wholesale pricing or other discounts? |



- In which regions or customer segments is the partner looking to expand its product or service offerings?
- Also prepare to discuss the market opportunity that further engagement would open to the potential partner.
 - How many phones may be purchased wholesale?
How many potential buyers could the partner reach were it to make affordable mobile phones available?
- Be sure to discuss and understand the partner's expectations for the potential costs and repayment terms that would be acceptable.
- Understand the potential risks the partner may face and come equipped with examples of how these risks have and can be mitigated.
- Where available, provide data, reports, or case studies demonstrating the business case for participation in a mobile phone uptake scheme.

Some specific uptake schemes to explore are outlined below:

- **Device asset financing models:** Identify stakeholders such as agrovets, agro dealers, outgrowers, producer groups, agribusinesses, and other relevant third-party providers (e.g., pay-go solar device vendors) that traditionally provide services to SHFs, including selling agriculture inputs on credit, lay-away, or lease-to-own plans. Once relevant partnerships are identified, explore the feasibility for financing mobile phones using a similar approach. Implementing partners should be prepared to demonstrate the business case of including mobile phones into inventory alongside other agricultural inputs and equipment, by presenting relevant detailed information (e.g., number of potential customers, anticipated cost outlays, potential profits, and other benefits).
- **Bulk purchasing options and installment payment plans:** Identify and build partnerships with mobile network operators, mobile phone vendors, or farmer organizations. Propose options such as bulk pricing and/or installment plans for mobile phones. Implementing partners should be prepared to demonstrate the business case to the MNO or vendor by presenting relevant detailed information (e.g., acquisition of new customers, brand loyalty, potential to reach entire value chains).
- **Financial products:** Identify and build linkages with financial service providers operating in the program activity zone. Assess available financial products and if financial products do not exist to finance mobile phones, consider how to propose options for saving or loan products that would be relevant for their existing and new clients. Implementing partners should be prepared to demonstrate the business case to the financial service provider by presenting relevant detailed information (e.g., numbers of existing/new clients, client income streams, client use of savings and loan products).
- **Shared/intermediary access models:** Identify and build partnerships with digital service providers, projects or initiatives that equip youth, mobile money agents, extension officers, community leaders, and/or digital extension agents to provide access to mobile phones and digital services for smallholder farmers and rural communities. Propose expanding these service offerings into areas where mobile penetration is low and/or mobile phone financing opportunities have yet to materialize. Implementing partners can provide support by helping to identify trainees with appropriate interest and skills. Further, implementing partners can sensitize farmer groups or VSLAs on the benefits of collective phone ownership, link groups to affordable purchasing options, and provide trainings on relevant service options.

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| | For any of these solutions, implementing partners should design and implement a pilot before a full rollout that is based on a detailed implementation plan. |
| 3 | <p>Address Corresponding Barriers to Phone Ownership: Though affordability is often one of the primary challenges for market actors to own mobile phones, corresponding barriers may also impact the long-term viability of the mobile phone financing solution. Many barriers are well documented in global research^{74,75,76,77} and their relevance should be confirmed by local market research. These may include literacy and digital skills, perceptions of relevant use cases and security, limited telecommunications network coverage and electricity, lack of identification documents to register for mobile phone subscriptions, and/or social constraints. USAID should encourage implementing partners to consider the degree to which these barriers exist and identify approaches and activities to mitigate them in the financing schemes. Some relevant activities may include:</p> <ul style="list-style-type: none"> • Training in digital skills • Training in use of relevant digital services • Training in digital privacy and security risks • Developing linkages with third-party providers of alternative energy (e.g., pay-go solar), • Advising market actors on how to process and obtain their identity documents • Conducting community awareness-raising workshops on the benefits of women and girls in owning mobile phones and/or engaging project ambassadors to dialogue with the community |
| 4 | <p>Advocate for Better Quality and Pricing of Phones in the Market: As appropriate, USAID should advocate to telecommunication regulators to use their Universal Service and Access Funds (USAFs), in countries where these are available, to subsidize the price of mobile phones so that low-cost phone brands (especially smartphones) are more affordable.⁷⁸ As an additional strategy, USAID Missions and implementing partners can engage host governments in developing policies that provide incentives to mobile phone providers such as waived taxes for producing affordable phones. USAID and implementing partners can help craft an approach that involves mobile network operators that sell phones and that provides local phone manufacturers access to these funds.</p> |

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