



Honduras Digital Agriculture Assessment

A report for USAID/Feed the Future
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List of Acronyms

ACS-PROASUR	Food Security for the Southern Dry Corridor
CENAOS	Centro de Estudios Atmosféricos, Oceanográficos y Sísmicos
CNBS	Comisión Nacional de Bancos y Seguros
CONATEL	La Comisión Nacional de Telecomunicaciones
COPECO	Comisión Permanente de Contingencias
D4Ag	Digitalization for Agriculture
DECA	Digital Economy Country Assessment
DFS	Digital financial services
DLEC	Developing Local Extension Capacity
ERP	Enterprise resource planning
FARMS	Food Security, Agriculture, and Resilient Market Systems
FHIA	Fundación Hondureña de Investigación Agrícola
FIDA	Fondo Internacional de Desarrollo Agrícola
FtF	Feed the Future
FUNDER	Fundación para el Desarrollo Empresarial Rural
IHCAFE	Instituto Hondureño del Cafe
Inalma	Inversiones Amalgamadas S.A. de C.V.
IP	Instituto de la Propiedad
IPs	Implementing Partners
ITU	International Telecommunications Union
IVR	Interactive voice response
KII	Key informant interview
LAC	Latin America and the Caribbean
MFIs	Microfinance institutions
MSME	Micro, small and medium enterprise

PYFLOR	Pilones y Flores de Honduras
SHFs	Smallholder farmers
SIA	Strategic Impact Advisors
TAM	Total Addressable Market
TMS	Transforming Market Systems

Executive Summary

Digital agriculture in Honduras is at a relatively nascent stage. While some of the larger, more capitalized stakeholders such as Olam and Cadelga have invested in customized digital systems, the vast majority of value chain actors are at the beginning of their digital transformation journeys, deploying free or widely used solutions such as WhatsApp/Facebook Messenger and Microsoft Suite (non-cloud versions). International development actors loom large as sources of both supply and demand for digital agriculture solutions. According to the findings of this landscape assessment, donor-funded programs are building solutions to meet challenges around information gaps, market linkages and access to finance. Yet these solutions are almost completely donor driven, with private sector stakeholders building solutions for development actors instead of a wider set of market actors (i.e. input retailers, processors, buyers and farmers).

Awareness of different opportunities in digital agriculture also seems to be relatively low among potential demand side stakeholders. Digital agriculture was often seen as simply sending agronomic advice via WhatsApp. Due to the nascent nature of demand for digital agriculture in Honduras, it is rare to find technology providers solely dedicated to digital agriculture solutions. The vast majority of technology companies building digital agriculture solutions are building customized solutions for either larger agribusinesses or development programming.

While the digital agriculture ecosystem in Honduras is in its early stages, there are several building blocks in place: good network coverage, strong smartphone penetration and a group of stakeholders well positioned to help the digital agriculture ecosystem accelerate. Key recommendations based on this landscape assessment are highlighted below and framed around three primary categories: 1) supply side, 2) demand side and 3) ecosystem support. Recommendations are also broken down by their relevance to current USAID activities, such as Transforming Market Systems (TMS); Food Security, Agriculture, and Resilient Market Systems (FARMS); the Coffee Alliance; and future programming at USAID/Honduras.



Supply Side Recommendations

For TMS

- 1) Find partners beyond development actors. Work with digital agriculture solution developers such as Agrodigital to examine their interest in launching services targeting specific agriculture actors beyond development partners. Work through some of the entrepreneurial activities TMS is running to support capacity building and links to fundraising for tech companies interested in developing digital agriculture solutions.

- 2) Facilitate matchmaking between supply and demand-side actors. Provide supply side actors like Proagro and Disagro with marketing opportunities with producer organizations. Smaller solutions often lack the funds to market their services properly. TMS can provide support in aggregating potential demand and matching digital agriculture suppliers with clients.
- 3) Encourage factoring solutions for micro, small and medium enterprises (MSMEs) linked to e-commerce. Consider a discussion with current partner Sube on a credit product for its MSME partners using accounts receivable and transactional data to determine credit worthiness. Services that provide similar products to Sube, such as Shopify in the United States, have had great success in providing credit products for clients using their platform to sell products online. There could be an opportunity for Sube to consider this for its 15,000 users (some of which are in the agricultural sector).

For Future Programming

- 1) Encourage the development of services with potential for commercial viability. Incentivize projects to shift from building digital solutions that meet development programming needs (e.g. for monitoring and evaluation) to incentivizing private and public sector actors to build services that have the potential for commercial viability. Donor-funded programs should continue providing a good source of demand for digital agriculture solutions, but only as part of a broader set of customer segments. Any digital agriculture solutions that development partners wish to undertake should try to be sourced through a company that intends to deliver the service to other customer segments in the agricultural sector.
- 2) Centralize an open source agronomic advice library. Help standardize information by centralizing an open source agronomic advice library for Honduras. Information services are the most bountiful supply of digital agricultural services in Honduras. Yet the majority of these services are driven by international development programs, and each information service solution uses its own set of curriculum and messaging.
- 3) Support MSMEs to use messaging platforms for data collection. Consider supporting MSMEs to use messaging platforms for purposes beyond communication and as a means of data collection, which can lead to the adoption of other services (e.g. supply chain management or farm management). Messaging platforms like WhatsApp are widely used among value chain stakeholders and to some extent at the farmer level. These can be valuable tools in introducing additional layers of digital transformation.
- 4) Utilize blended finance approaches. Leverage blended finance approaches to establish guarantees for banks or microfinance institutions (MFIs) willing to explore the use of alternative credit scoring practices. This could bring in more clients who have previously been unable to meet collateral requirements for loans.



Demand Side Recommendations

For TMS

- 1) **Build digital capacity for MSMEs beyond e-commerce.** Continue building digital capacity among MSMEs through business development services, but include education on other digital agricultural services beyond e-commerce. While e-commerce is an important skill for many MSMEs, the logistics and supply chain infrastructure around smallholder farmers (SHFs) has a long way to go until they can participate in e-commerce. TMS could consider developing a tiered approach, depending on the maturity of the business, including modules that provide insights on how to track inventory and build out basic accounting records by using messaging platforms, simple data collection applications and cloud services from Google or Microsoft. Other modules can move on to more advanced usage of digital transformation services in accounting and supply chain management.
- 2) **Improve market research and segmentation to identify demand and market size.** Conduct digital needs assessments of mid- and downstream stakeholders of targeted agricultural value chains. TMS is in a unique position to tap its existing network of MSMEs to increase the understanding of where potential demand for digital agriculture services sits for this level of the market segment. A market study could provide some market sizing estimates, which could be used as an incentive for technology providers who have only been designing products and services when contracted (versus designing something for mass consumption). This type of market research could also be used to inform fundraising goals for technology companies interested in expanding services to the agricultural sector but lacking the funds to do so.

For Future Programming

- 1) **Encourage digital transformation at the cooperative level.** Cooperatives are the closest value chain stakeholder to farmers, and they are often key for accessing inputs as well as finding markets for crops. Some cooperatives have already begun their digital journeys by implementing core banking products that enable interaction between different branches. Yet there are other digital tools, particularly around inventory management and farmer coordination, that could help improve operational efficiencies.
- 2) **Increase awareness of digital tools and technologies.** Although the demand side's usage of digital tools and services in agriculture is relatively low, when agribusinesses cited how they learned about the availability of these tools and services they identified learning and networking events as well as personal connections. Hosting capacity building workshops and familiarizing agribusinesses with the available digital tools and services in their country and in the region could help increase their demand for these

services. Agribusinesses must also be made aware of the effectiveness and benefits of these services—not just their availability. Raising awareness may also help agribusinesses recognize the value of investing in them.

- 3) **Build digital literacy.** Hesitancy to adopt and uptake digital tools among middle-aged employees and customers was one of the common challenges referenced by agribusinesses. This reluctance may be explained by individuals' limited knowledge and lack of confidence in using these tools. In order to support agribusinesses' digital transformation, USAID activities should prioritize and continue to support the development of digital literacy in Honduras.



Ecosystem Support Recommendations

For Future Programming

- 1) **Strengthen data stewardship.** Monitoring and evaluation are crucial, and many development projects have detailed farmer databases. Information on production, plot location, input usage and other relevant agronomic data exists, but it is oftentimes fragmented across different donor-funded programs. This landscape assessment looked at a wide variety of programs that, when combined, have datasets on over 200,000 farmers. To improve the data ecosystem on SHFs in Honduras, the Mission should think about ways to incentivize its projects to consider ways to keep these databases live. Potential data partnerships could exist between private sector partners, such as input providers or agribusinesses purchasing produce, who are going through digital transformation processes and would have use for digitized farmer data. Donor-funded projects in particular, could consider ways to standardize datasets to help improve their portability. In addition to standardization, there should be additional support to build strong data protection protocols around the datasets. This would help establish specific data sharing frameworks to support the longevity of the data collected, while maintaining privacy and security standards, with a particular focus on data subjects.
- 2) **Strengthen public sector capacity in data management and information sharing.** While the private sector plays an essential role in ensuring digital agriculture solutions are delivered in a customer friendly manner, some of the data that private sector actors depend on should be coming from public sector-led initiatives. The meteorological government institution Centro de Estudios Atmosfericos, Oceanográficos y Sísmicos (CENAOS) has 180 weather stations around the country in addition to access to other remote sensors (e.g. satellite imagery) for weather forecasting. INFOAGRO and SIMPAH are also government-run programs that source market prices for crops and use satellite data to conduct soil maps. Future programs should continue to strengthen the data and information produced from these public institutions, while also encouraging public/private sector partnerships that enable private sector players access to quality

information they can then disseminate to farmers in smart and innovative ways. This is especially important for index insurance providers who have trouble relying entirely on remote sensor data and still send actuaries into the field to assess claims.

- 3) **Strengthen movable asset registries.** The Instituto de la Propiedad (IP) has established a digital means of registering land into its system as well as movable assets such as machinery. Continuing to strengthen these types of registries can help smaller producers utilize assets to gain access to credit. The Mission can also support IP in considering the registration of cattle as a movable property, which would expand the type of asset classes possible to use for collateral in the market.

Introduction

Purpose of Assessment

The objective of this assessment is to help USAID/Honduras and its key active activities, such as TMS, establish a stronger understanding of the digital agricultural landscape in Honduras. The assessment examines the country's digital agricultural market ecosystem, taking into consideration both demand and supply factors in addition to supporting functions and regulations. Our goal for this report is to provide USAID/Honduras and its key partners relevant and realistic recommendations to help strengthen the quality of digital agricultural services available in Honduras (supply) while increasing the awareness and usage of these services (demand). The report aims to provide recommendations relevant to current USAID/Honduras Feed the Future (FtF) activities as well as ideas for future program design.

Honduras Agricultural Overview

Agriculture is a significant component of the economy of Honduras. Over the past 10 years, the agricultural sector has contributed an average of 12.34% to the country's GDP. However, the growth rate of the sector is not constant and has fluctuated over the last two decades.

In 2017, Honduras exported \$9 billion worth of products, with coffee accounting for 12% of all exports (making it the second most valuable export product).¹ That same year, Honduras exported \$1.92 billion worth of vegetable products, \$535 million of foodstuffs, \$464 million of animal and vegetable bi-products, and \$363 million of animal products. Coffee, bananas, palm oil and sugarcane remain the main traditional agricultural products, with coffee and bananas being the largest export crops,² though diversification is increasing with the production of melon, horticultural products, shrimp and tilapia.

¹ <https://legacy.oec.world/en/profile/country/hnd/>.

² <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/133215/filename/133425.pdf>.

Approximately 29% of the country's economically active population works in agriculture. In rural areas of Honduras, agriculture is the main source of income and employs 75% of people older than 15 years of age.³ Roughly one-quarter of Honduras' 2 million rural women work in agriculture.⁴ Almost 80% of poor households earn income from agriculture, compared to only 35% of non-poor households.⁵ In 2017, the agriculture value added per worker (that is, the ratio between value added in agriculture and number of people employed in agriculture) was \$2,332.09.⁶

Honduras is prone to shocks that affect agricultural production, such as international price fluctuations and extreme weather events. The country's agricultural sector has lost about one-third of its revenue over the past two decades, in part due to the declining prices of the country's largest export crops.⁷ Hurricanes Eta and Iota (November 2020) had a significant impact on agricultural activities, with up to 70% of crops and grains affected by the storms.⁸ Extreme rainfall, atypical droughts, variation in rainfall dates, fertility losses and land erosion are all recurring and ongoing threats to the success of the agriculture sector.

The International Fund for Agricultural Development (IFAD) in coordination with the government of Honduras has developed a Roadmap for the Transformation of the Food System in Honduras. The roadmap identifies key activities that will help achieve a vision for 2030 that strives for Honduras to have a "comprehensive and strengthened food system that takes advantage of existing potential and minimizes inequity gaps in the population". The roadmap focuses on two primary courses of action to achieve this vision, 1) *Promoting equitable livelihoods and reducing inequalities* and 2) *Build resilience to vulnerabilities, shocks and stresses*. Digital channels are called out in several ways to help achieve these courses of action, including 1) continuing to strengthen the digital infrastructure in Honduras, 2) building capacity of food system stakeholders to utilize digital channels effectively, 3) promoting access to digital trading platforms to improve market access, and 4) leveraging digital channels to improve market information systems. By 2025, the roadmap hopes to energize digital transformation in the food system⁹.



³ <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?locations=HN>.

⁴ <https://www.creativeassociatesinternational.com/insights/empowering-women-in-agriculture-in-rural-honduras/>.

⁵ <https://webapps.ifad.org/members/eb/130/docs/EB-2020-130-R-18.pdf>.

⁶ <https://ourworldindata.org/grapher/agriculture-value-added-per-worker-wdi?tab=chart&country=HND>.

⁷ <https://www.ifad.org/en/web/operations/w/country/honduras>.

⁸

<https://www.care-international.org/news/press-releases/small-scale-farmers-and-families-struggle-with-economic-ruin-as-up-to-70-of-honduras-crops-and-grains-are-affected-by-storms-eta-and-iota>.

⁹ <https://summitdialogues.org/wp-content/uploads/2021/09/english.pdf>

Digital Ecosystem and Trends in Honduras

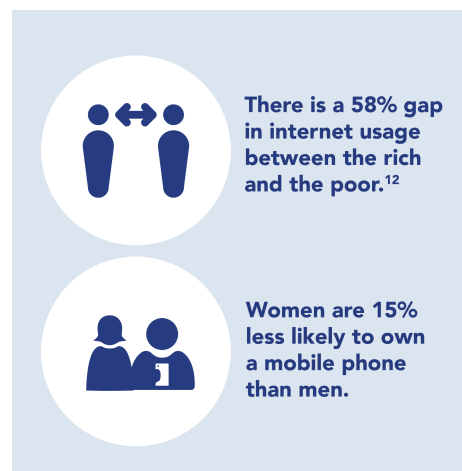
While a [Digital Economy Country Assessment \(DECA\)](#) has not been conducted in Honduras, a quick summary of key digital ecosystem framework elements can be found below.

Digital Infrastructure and Adoption

Three telecommunication operators lead the market in Honduras: Claro, Hondutel and Tigo. Tigo holds the largest market share in mobile subscriptions, with 69.2% of mobile subscriptions and 4.64 million subscribers. Claro and Hondutel, a government-owned telecommunications operator with low coverage, follow. All three operators offer a range of coverage options, ranging from 2G to LTE, with 2G and 3G spanning the most coverage across the country. The majority of the Honduran population — 88% — is covered by a 3G network.¹⁰ This data point should be taken with a grain of salt, as Honduras' Mobility Connectivity Index score for network performance is 49.5, which is considered "emerging."

When compared to the rest of Latin America and the Caribbean (LAC), Honduras' mobile connectivity falls behind. According to GSMA's Mobile Connectivity Index, Honduras scores at 50.21, 10 points under the LAC region's index score of 60.76.¹¹ Despite the Government of Honduras' Digital Agenda 2014-2018,¹² aimed at closing the digital divide, there remains a 58% gap in internet usage between the rich and the poor.¹³ One reason for this divide could be the elevated costs of mobile broadband. Honduras scores low in affordability of mobile services compared to the availability of mobile services.¹⁴ A digital gender gap in Honduras also exists, with women 15% less likely to own a mobile phone than men.

Between 2020 and 2021, the number of internet users in the country grew by 10.6%, and the number of social media users grew by 17.1%.¹⁵ Mobile broadband connectivity penetrated 62% of the country's population, while mobile connectivity penetration remained at 85%.¹⁶ Despite the increase in internet users and strong mobile connectivity, Honduras' more distant and mountainous departments, where a lot of



¹⁰ GSMA, Mobile Connectivity Index, 2021.

¹¹ The GSMA Mobile Connectivity Index takes into consideration infrastructure, affordability, consumer readiness and content and services to score mobile connectivity on a scale of 1 to 100, with higher scores representing stronger mobile connectivity.

¹² <https://www.scgg.gob.hn/es/node/74>.

¹³ OECD, 2017.

¹⁴ <https://www.oecd-ilibrary.org/sites/e7a00fd6-en/index.html?itemId=/content/component/e7a00fd6-en#fig-3.2>.

¹⁵ GSMA Mobile Connectivity Index, 2021.

¹⁶ <https://datareportal.com/reports/digital-2021-honduras>.

¹⁶ Ibid.

Honduran crops are grown, face connectivity constraints. These more rural and mountainous departments have weaker networks and do not benefit as much from higher speed internet.¹⁷ Several of the agribusinesses engaged during this assessment cited low or poor quality connectivity in their regions of work (notably Lempira, Ocotepeque and Copán) as challenges faced in the adoption of digital tools and technologies.

Low digital financial literacy and digital literacy levels also remain a barrier to the adoption of digital tools and technologies in the agricultural sector. Although the use of mobile phones is prominent in Honduras, the skill level to go beyond the use of social media apps and communication tools like WhatsApp and SMS remains limited, especially among older individuals. Many of the agribusinesses interviewed during this assessment highlighted that farmers over the age of 50 were especially hesitant to use and adopt digital tools, and that training and capacity building were of particular importance to mitigate this challenge in uptake.

Digital Governance

The International Telecommunications Union (ITU) has a ICT regulatory tracker that measures changes taking place in the ICT regulatory environment of countries around the world. Honduras has the highest score among its Northern Triangle neighbors, with a score of 79/100. ICT regulation has grown with ICT infrastructure in Honduras, as can be seen in the graphic below, which observes the country's ICT Regulatory Tracker score from 2007 to 2020.¹⁸

ICT Regulatory Tracker 2007-2020, Honduras



Source: ITU

¹⁷ GSMA Coverage Maps. <https://www.gsma.com/coverage/#162>.

¹⁸ <https://app.gen5.digital/tracker/country-cards/Honduras#regulatory-regime>.

The Government of Honduras has an ongoing digital transformation initiative called Digital Government. This initiative is attempting to move a wide variety of government services online through its Digital Honduras portal: <https://gobiernodigital.gob.hn/>. The Digital Government unit has developed a “Master Plan” that highlights other key elements of the Honduran digital transformation strategy, including 5G, data protection and operational transparency.¹⁹

In 2015, Honduras passed the Law on Electronic Commerce, which was drafted in accordance with the United Nations Commission for International Trade Rights. The legislation regulates things like the validity of electronic signatures, which enables the execution of contracts and other legally binding agreements to occur online.

Honduras does not have any current legislation that directly addresses data protection, nor does it have any authorities monitoring and enforcing penalties for data breaches. In 2013, a law called the Citizens Law was introduced to congress, but as of early 2022, none of the articles of this legislation have been passed. The primary regulatory body for the digital ecosystem in Honduras is La Comisión Nacional de Telecomunicaciones (CONATEL). CONATEL regulates the telecommunications industry and facilitates spectrum distribution among other key factors that enable broader digital modernization.²⁰

Digital payment service providers that enable e-commerce transactions are regulated by the Comisión Nacional de Bancos y Seguros (CNBS). CNBS passed Law No. 01/2016 in 2016 regulating electronic money issuance, paving the way for mobile money and payment service providers. CNBS also passed an agent banking law in 2013 (Circular CNBS No. 251/2013), which enables non-bank branches to provide a basic set of financial services (e.g. withdrawals/deposits).

Digital Economy

Digital economy, as defined by the digital ecosystem framework, takes into consideration things like ICT talent and skills, the tech startup environment, e-commerce and digital financial services (DFS). According to the World Economic Forum’s Global Competitiveness Index data retrieved by the World Bank, which considers survey responses from business executives in Honduras on the reality of ICT and digital skills in the country, Honduras scores 3.63/7 in digital skills among its population, which is on par with the regional median. However, from 2017 to 2019, there was no improvement to this score.²¹ While interviewing supply side stakeholders for this landscaping assessment, only two of the 17 interviewees stated there were readily available ICT professionals. Most stated that ICT professionals were somewhat easy to find, while six stated it was very difficult to find good talent.

¹⁹ <https://www.scgg.gob.hn/es/node/83>.

²⁰ <https://www.dataguidance.com/notes/honduras-data-protection-overview>.

²¹ https://tcdata360.worldbank.org/indicators/hb0649ed2?country=HND&indicator=41400&viz=line_chart&years=2017,2019.

The tech startup environment in Honduras does not yet enable growth. Startup incubators are extremely nascent in Honduras, and acceleration programs that help companies scale and access larger rounds of funding are nonexistent. There are several technology hubs, including Impact Hub, Startup Reef and Startup SPS, yet most of these hubs are loose networks of entrepreneurs, with very little funding and even less ability to generate revenue through office space rental due to COVID-19. The USAID TMS project is working to strengthen the entrepreneurial ecosystem, but the tech startup environment remains very small and underfunded at present.²²

Although e-commerce in Honduras has grown significantly in recent years, with platforms like WooCommerce, Square and others providing a way for retailers to find a new market share online, the agricultural sector has not been a leading stakeholder. While there are a couple examples of e-commerce being used to help address market linkage barriers in Honduras, there is still a long way to go for e-commerce and agriculture. TMS is working to help MSMEs build capacity and create online stores and an online marketing presence.

Digital Financial Services

There is one mobile money operator in Honduras, Tigo Money, offered by the mobile network operator Tigo. Tigo Money has more than 1.3 million customers, more than 5,000 agents and coverage in 18 departments in the country. Tigo Money offers mobile money transfers, cash-in cash-out, bill payment and international remittances to individual customers with or without a bank account. Businesses are offered all of these services in addition to bulk payments. These bulk payments, however, require certain levels of connectivity and data management tools. Credit and insurance are not offered by Tigo Money, and none of the DFS offered cater specifically to the agricultural sector.

The fintech landscape in Honduras has been growing.²³ Fintechs like TENGO have been particularly successful in offering DFS to Hondurans. TENGO offers users a digital wallet accessible via a mobile app for Android or iOS whereby they can deposit money from their bank account (no matter the bank), transfer money, make payments at participating merchants and withdraw funds at participating ATMs.

Although the active use of mobile money services in Honduras is significant, DFS offered are limited and undiversified — particularly for the agricultural sector.²⁴ Aside from digital bank transfers and payments between cooperatives offered by all of the financial service providers interviewed (COMPROIL, COMLESUL, Banco Atlántida and Banco de Occidente), no other DFS are offered to the agricultural sector.

²² TMS report, Entrepreneurship Addendum.

²³ <https://www.cnbs.gob.hn/blog/2021/05/21/las-fintech-en-honduras-y-su-aporte-a-los-usuarios-financieros/>.

²⁴ <https://www.centerforfinancialinclusion.org/mobile-money-and-honduras-financial-inclusion-landscape>.

Methodology

Methods

Strategic Impact Advisors (SIA) commenced this study with desk research, reviewing previous assessments, notably the ECLAC's 2021 study,²⁵ and TMS' Market Systems Diagnostic, as well as other online resources that provided information on the sector.

In October 2021, SIA sent an online survey and key informant interview (KII) invitations to 52 different demand and supply side stakeholders including agribusinesses both mid-sized (<100 employees) and large (>100 employees), technology providers, USAID Implementing Partners (IPs), other development organizations, government agencies, financial institutions and mobile network operators. Created and distributed via SurveyMonkey, the survey asked respondents to describe their use and/or development of digital agriculture tools from the demand and supply side, respectively. SIA received 38 survey responses, 23 from the supply side and 15 from the demand side.

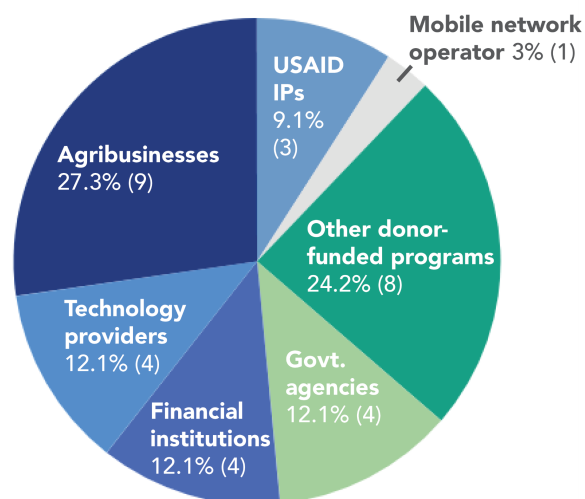
KIIs were held remotely in accordance with COVID-19 health and safety protocols. Between October 18, 2021 and December 9, 2021, SIA conducted 33 KIIs with organizations using remote conferencing.

For the majority of interviews, SIA used a structured interview format, focused on details of the digital tools interviewees used and/or developed. The list of interviewed organizations can be found in Annex 1 and the interview question sets can be found in Annex 3.

Limitations

Most of the information in this report is self-reported by users, developers and owners of digital tools. Because SIA had very limited ability to independently verify the information, it is worth acknowledging that some responses may be skewed. In particular, developers of digital tools may be overrepresenting the reach of their tools so as to promote them, either to capture more

Key Informant Interview Participants



²⁵ ECLAC, "Análisis de las políticas públicas e iniciativas privadas que apoyan el uso de las tecnologías digitales en las mipymes agrícolas y agroindustriales en Honduras," 2021.

users or funders, or as part of a general goal to promote their organization. In responding to an assessment conducted for USAID, a major funder, it is possible that a number of respondents were incentivized to be overly positive about their tool.

It is also possible that demand side KII answers are skewed, as tool owners are likely to give numbers for the more active, positive users. SIA took this possibility into account when analyzing demand side feedback.

Taxonomy

To identify the varying use cases of digital solutions in the agricultural sector, this report uses data definitions and taxonomies developed in September 2021 by the [Digital Agri Hub](#). The full list of taxonomies and definitions can be found [here](#). The relevant and applicable use case definitions referenced in this report can be found below. A table showing the digital use cases present in Honduras, by stakeholder, can be found in Annex 2.

Digital Use Cases Identified in Honduras

Use Case	Definition
Advisory	Digitally-delivered information on topics such as agronomic best practices, pests and diseases, weather and market prices. This can also include more sophisticated digital services and farm management software tailored to the specific farmer, farm or field that enable SHFs to make decisions that maximize output from their land, improve the quality of agricultural production and maximize farm revenues.
Sub-use case: Farmer Information Services	Services that provide general advisory information on agronomic best practices (e.g. growing, harvesting, post-harvest treatment, storage, inputs and market prices) without tailoring the recommendations beyond national, value chain or district levels.
Sub-use case: Precision Agriculture Advisory	Recommendations tailored to individual and localized agro-climatic conditions (e.g. weather, soil, etc.), crop varieties and the economic setting of the farm (e.g. input prices, market prices and market distances).

Use Case	Definition
Market Linkage & E-Commerce	Digitally-enabled solutions that link SHFs to high-quality farm inputs (e.g. seeds, fertilizers, herbicides/pesticides), to production and post-harvest machinery and mechanization services (e.g. irrigation, tractors, cold storage), or to off-take markets, including agro-dealers, wholesalers, retailers or even the end-consumer.
Sub-use case: E-Commerce Services	Online retailers of agricultural produce for urban consumers or agricultural inputs for SHFs. They rely on online order fulfillment via either shipping or a combination of online and offline (i.e. brick and mortar store) footprints.
Sub-use case: E-Marketplaces	Digitalization for Agriculture (D4Ag) market linkage solutions that require little or no human intermediation. These solutions bring individual buyers and sellers together via virtual trading marketplaces.

Use Case	Definition
Supply Chain Management	Business-to-business services that help agribusinesses, cooperatives, nucleus farms, input agro-dealers and other SHF value chain intermediaries manage the flow of goods and services.
Sub-use case: Traceability and Certification Solutions	Solutions that help agribusinesses onboard farmers, document farm compliance with standards, and trace produce across value chains with higher fidelity and lower costs.
Sub-use case: Logistics	Tools that support the surveillance and operational improvement of physical storage and transport infrastructure and, in particular, the transport of agricultural products across the full span of the value chain, from producers to markets.
Sub-use case: Supply Chain Enterprise Resource Planning (ERP) Solutions	Software that digitizes and helps manage and integrate core business processes like supply chain operations, logistics, reporting, financial tracking and human resource activities.

Use Case	Definition
Finance	DFS relevant for SHFs, such as digital payments, savings, smallholder credit and agricultural insurance, which increase financial access and equip SHFs to improve yields and incomes and invest in the longer-term growth of their farms.
Sub-use case: Payments	Allows SHFs, input providers, buyers and others to exchange money with each other without cash.
Sub-use case: Insurance	A valuable tool to help SHFs avoid devastating financial losses and limit downside risks associated with investing in their own productive capacity.
Sub-use case: Credits and Loans	Digital lending products specifically designed for farmers and digitized elements of lenders' operations.

Use Case	Definition
Ecosystem Support	Data analytics solutions and digital decision support tools that integrate a variety of data sources on SHFs, farms and markets and convert this information into useful country- and value-chain-level insights and decision tools for government policymakers, extension agencies, agronomists, agribusinesses and investors.

Digital Use Cases Present in Honduras

Supply Side Actors

The digital agriculture landscape in Honduras is extremely nascent, with very little services being provided by private sector actors. The vast majority of digital agriculture services are delivered either via international development projects or through larger value chain partners. The agriculture sector typically leverages larger platforms and software services that are used for a broader range of use cases (e.g. WhatsApp, accounting software). Larger value chain partners have seen the benefit of digital transformation and have invested in their own customized systems, leaving a gap in product availability for small and medium businesses working within the sector.

We found three general types of suppliers of digital agriculture services in Honduras: 1) agribusinesses that have built their own platforms using either internal programmers or outsourced software engineers, 2) technology companies or 3) international development projects that have built their own services using either internal programmers or outsourced software engineers.

The section below provides details on the current supply of digital agriculture products and services in Honduras. It examines how those products are being used and where additional pockets of demand might exist. These insights are organized by the various digital agriculture

taxonomies defined above, though not all taxonomy categories will be addressed. The chart in Annex 2 displays which taxonomy categories are currently being served in Honduras.

Advisory Services

Advisory services are the most abundant digital agriculture service available in Honduras. The vast majority of these services are provided by donor-funded projects or government-led initiatives. Some key takeaways from SIA's review of the various advisory services can be found below.

WhatsApp as a primary digital channel use case

Digital advisory services were mostly used as a means of complementing traditional extension services, and typically delivered via WhatsApp. Other channels used less frequently include social media pages (mostly Facebook) and online portals. The vast majority of the service providers interviewed require some level of connectivity to the internet to access information, with no services offering basic SMS or Interactive Voice Response (IVR) that could be delivered without internet connection.

Fewer options for non-smartphone and illiterate populations

Many of the encountered advisory services use WhatsApp as the information delivery platform, meaning many farmers without smartphones will be unable to access the information. The text-based advisory services also exclude farmers who are illiterate, though this is less of a concern in Honduras, where the literacy rate is nearly 90%. Data from CONATEL indicates mobile internet usage and thus smartphone penetration grew from 30% to 51% between 2019 and 2020. While such rapid growth is good news for the wider adoption of smart device applications, the rural populations who experience issues with energy and quality connectivity are still the most likely to own a basic or feature phone. SMS options were available in some cases, but the vast majority of providers seemed to prefer WhatsApp, as it's cheaper than paying for bulk SMS services.

Multiple efforts with the same functions

While previous USAID activities such as Developing Local Extension Capacity (DLEC) worked to strengthen some of the overarching structures of extension, digital advisory services still remain fragmented as many different projects attempt to do the same type of digital extension (using WhatsApp as the primary channel). During interviews, many of the participants described similar services, in some cases being delivered in the same regions of the country. While these advisory services are similar, all of the interviewees produced and updated their own content.

Platform sustainability is a big question mark

Most of the advisory services are offered through donor-funded projects, and many did not have a clear answer for how these advisory services would be continued post project.

Digital advisory services seem to have a positive impact on productivity

Where numbers were available, digital advisory services had a positive impact on productivity and income for farmers. Heifer International stated their Taurus Web advisory services helped contribute to a 70% increase in productivity across a variety of value chains (livestock, coffee and cacao). COHONDUCAFE stated their coffee farmers saw a 20% increase in yield among farmers who were interacting with their digital advisory services.²⁶

Advisory Service Deep Dives

The below analysis looks at the specific details of each digital advisory service found through desk research and KIIs. This analysis highlights the types of services provided; the type of provider delivering the service (based on the three primary digital agriculture service providers discussed above); who their primary clients are; usage and growth data (when available); and key successes and challenges faced. SIA was unable to test the majority of the digital tools and services to assess user experience firsthand, so these assessments are primarily based on self-reported data. For the few solutions that SIA was able to test, an assessment on user friendliness and accessibility has been included.

Name:	IBM's Watson Decision for Agriculture Platform	Relevant Taxonomy Sub-Categories:	Precision Agriculture
Provider Type:	Technology Provider	Value Chain Focus:	Cacao
Target Clients:	Farmers, Cooperatives, Development Projects	# of Users (active):	Pilot has yet to launch
User Growth (if applicable):	Pilot has yet to launch	Pricing (if applicable):	Provided free of charge
Overview of Services:	Heifer International has partnered with IBM and the cacao cooperative COPRANIL to launch the use of a digital advisory service that combines predictive artificial intelligence with geospatial, weather, environmental and IoT field data (when available) to build a tailored advisory dashboard for a farmer's land. The system plans to enable customized weather alerts, optimal planting and input applications, and expected yields linked to market pricing updates.		
User Experience:	Registration and onboarding will be done by COPRANIL and Heifer staff. Farmers will be able to access the service through an online portal or simply receive messages via text.		
Key Successes:	Pilot has yet to launch		
Key Challenges:	Pilot has yet to launch		

²⁶ Both of these values were reported by Heifer International and COHONDUCAFE staff, respectively, during KII interviews held. No further detail was provided on how these values were calculated.

Name:	Agrodigital and Fundación para el Desarrollo Empresarial Rural (FUNDER)	Relevant Taxonomy Sub-Categories:	Farm Information Services
Provider Type:	International Development Project (funded by Government of Honduras and IFAD)	Value Chain Focus:	Basic grains, vegetables, fruits and coffee
Target Clients:	Farmers	# of Users (active):	1,800 users across 66 savings groups (20% are women)
User Growth (if applicable):	Project goal of 66 savings groups has been realized, but hopes to amplify outreach to an additional 70 savings groups	Pricing (if applicable):	Farmers are not charged anything, and there was not a clear sustainability plan at the time of this assessment
Overview of Services:	FUNDER licenses Agrodigital's primary digital agriculture solution which digitizes rural savings groups (Cajas Rurales), whose members are often involved in agriculture. The primary service FUNDER is offering is a digital savings wallet, called Mi Caja, which will be discussed in the financial services section below. As part of a broader bundled service, Mi Caja also offers agronomic advice to farmers via the app, which is accessed through Android and iOS devices. The content and planning for this advice is done by FUNDER, which uses the Agrodigital platform to push agronomic advice messaging. Agrodigital provides the software and technical support, but does not do any direct farmer outreach. Instead, it works with clients such as FUNDER who then work directly with farmers.		
User Experience:	Farmers access farming advice relevant to their value chains via the app, and advisory messaging is also pushed through WhatsApp. All services are accessed via smartphone.		
Key Successes:	Agrodigital and FUNDER have rolled the service out to 66 savings groups who access information on best farming practices on a monthly basis.		
Key Challenges:	The onboarding process was difficult for many new users and the service requires consistent training.		

Name:	FAO	Relevant Taxonomy Sub-Categories:	Farm Information Services
Provider Type:	International Development Project (funded by FAO)	Value Chain Focus:	N/A; FAO does not center its work around specific value chains
Target Clients:	Farmers	# of Users (active):	40,000 beneficiaries across eight projects
User Growth (if applicable):	N/A; FAO maintains the same number of beneficiaries in its projects	Pricing (if applicable):	Free of charge
Overview of Services:	FAO is providing several services directly to farmers. One service is delivering agronomic advice via digital channels including WhatsApp, SMS, social media and a dedicated website. The information centers around weather, best practices and pest control. The service is implemented through local partners who work directly with farmers. FAO is currently providing these information services across eight different projects in Honduras.		
User Experience:	Farmers access information on basic phones via SMS, on smartphones via WhatsApp, or through social media or web portal. All information is text-based.		

Key Successes:	FAO cited improved resilience of crops as its primary success.
Key Challenges:	No challenges were mentioned during the interview.

Name:	Food Security for the Southern Dry Corridor (ACS-PROASUR)	Relevant Taxonomy Sub-Categories:	Farmer Information Services
Provider Type:	International Development Project (funded by Global Agriculture and Food Security Program, The World Bank, Government of Honduras)	Value Chain Focus:	Basic grains, fruits, vegetables, coffee, sesame and cashews
Target Clients:	Farmers, MSMEs	# of Users (active):	12,000 project beneficiaries
User Growth (if applicable):	ACS-PROASUR maintains the same number of project beneficiaries	Pricing (if applicable):	Free
Overview of Services:	The ACS-PROASUR project works on a variety of services that focus on MSMEs and SHF households. Information services on best practices, weather and pest control are delivered using digital channels like WhatsApp, SMS and email. The project uses open source technologies such as ODK for data collection and utilizes available technology platforms to disseminate information.		
User Experience:	Users are registered through the project and then receive messages via channels they have selected.		
Key Successes:	The project noted increased yield and income after farmers diversified their crops based on information and other support from the project.		
Key Challenges:	There were no challenges mentioned during the interview.		

Name:	Disagro's Agritech GEO solution	Relevant Taxonomy Sub-Categories:	Precision Agriculture Advisory
Provider Type:	Technology company that has developed digital agriculture specific products	Value Chain Focus:	No specific focus
Target Clients:	Medium and Large-Scale Farms, Value Chain Actors (i.e Input Providers)	# of Users (active):	380 (Covering 74,000 hectares)
User Growth (if applicable):	A target of 10% growth each year	Pricing (if applicable):	Three different levels of pricing (Basico, Oro and Platinum). Each service level brings additional services to the client. The pricing for these services varies depending on client size. No fixed price was given, but

			pricing was typically based on the amount of hectares the service would be tracking. There was a range of US\$3 to US\$7 per month per hectare.
Overview of Services:	Disagro's Agritech GEO solution aims to provide customized real time information to producers so they can make informed decisions around planting schedules, pest control and harvesting. The system integrates a variety of data inputs including weather station data, satellite imagery, and in some cases soil sensors and drone imagery. The services are delivered through the app, and messages can be pushed via WhatsApp and other web-based messaging services. Messages can be tailored to the customer based on their location and the types of crops they grow.		
User Experience:	Clients mainly interact with the service via the app, which is available on iOS and Android devices.		
Key Successes:	Disagro cited increased production efficiency and yields as success for its clients.		
Key Challenges:	Disagro's primary challenges had to do with connectivity in more rural areas, as well as challenges with behavior change when it comes to onboarding new clients. Many farmers are resistant to change.		

Name:	Instituto Hondureño del Café (IHCAFE)	Relevant Taxonomy Sub-Categories:	Farmer Information Services
Provider Type:	International Development Project (funded by Government of Honduras)	Value Chain Focus:	Coffee
Target Clients:	SHFs, Commercial Farmers	# of Users (active):	5,000 SHFs and 500 larger commercial farms
User Growth (if applicable):	They maintain the same number of beneficiaries	Pricing (if applicable):	IHCAFE charges a dollar per quintal (46 kilos) of coffee the farmer sells to them for the information services it provides
Overview of Services:	IHCAFE delivers a variety of information services to its farmers. Like many other international development organizations, it delivers farming advice, weather forecasts, pest control and warnings, and market pricing information to farmers. This information is disseminated through WhatsApp, SMS and email.		
User Experience:	IHCAFE program trains extension staff (IHCAFE has 100 extension workers trained) who then onboard and train farmers on the information services available to them. Farmers can access information through messages pushed through WhatsApp, SMS or email.		
Key Successes:	No successes were referenced by the interviewee, but it was said that the information services had been implemented without any issues.		
Key Challenges:	No challenges were identified by the interviewee.		

Name:	INFOAGRO-SIMPAH	Relevant Taxonomy Sub-Categories:	Farmer Information Services
Provider Type:	Government-led initiative implemented by an international development partner and funded by international donors (including USDA and USAID)	Value Chain Focus:	No specific value chain
Target Clients:	Farmers, Government, Cooperatives, Value Chain Actors	# of Users (active):	Around 2,000 information requests received per day
User Growth (if applicable):	No exact numbers, but demand has grown consistently over the past three years	Pricing (if applicable):	Considered a public good, so services are free of charge
Overview of Services:	INFOAGRO-SIMPAH is implemented through Fundación Hondureña de Investigación Agrícola (FHIA) and the Ministry of Agriculture in Honduras. The platform is a long-standing information center for the agricultural sector to access market prices and early warnings concerning pests and disease. The platform takes prices from different regions and makes them available via their website. Farmers can also register to receive messages via WhatsApp or SMS concerning specific regions and crops. At the moment the web page is the primary way information is passed on, as each day a new PDF with market price information is uploaded. It also offers an online map called Agromapas, which provides geographical data on the main production zones in Honduras. The map, found here , is meant to help buyers, investors and the government make strategic decisions for maximizing production.		
User Experience:	Users can access the market price service through messaging services, social media and the website hosted by FHIA. Agromapas can be found by visiting this link . Only accessed via the web, Agromapas is not easily accessible for users that have connectivity issues or do not have desktop or laptop computers.		
Key Successes:	Both services have led to improved incomes for farmers, either through better knowledge of prices to enable negotiation or through better decision-making and planning as a result of the information found through Agromapas.		
Key Challenges:	The primary challenge mentioned was the low amount of funding that was allocated for these services.		

Name:	FONTAGRO Digitization of Small-Scale Agriculture Project	Relevant Taxonomy Sub-Categories:	Precision Agriculture Advisory
Provider Type:	International Development Project (funded by Inter-American Development Bank)	Value Chain Focus:	Short-cycle crops
Target Clients:	SHFs of short-cycle crops	# of Users (active):	30 farmers will be using the sensors provided by FONTAGRO in March 2022
User Growth (if applicable):	N/A	Pricing (if applicable):	The three prototype sensors are valued at US\$50-60 per sensor, however, for this pilot project they are provided to farmers at no cost. Upon completion of the pilot, FONTAGRO will get a better

			understanding of the pricing models it could offer to farmers.
Overview of Services:	With funding from the Inter-American Bank and in partnership with Zamorano University, FONTAGRO is implementing a two-year experimental project that promotes the use of sensors to determine soil moisture on an hourly basis in 30 pilot farms dedicated to planting short-cycle crops. At the end of the crop cycle (six months), the Fontagro technician will visit each farm to collect the information stored in each sensor using software. This information will be linked to the development of each crop and serve as the basis for the preparation of a manual on the use of good soil moisture conservation practices and good production practices. The objective of the project is to validate the ability of low-cost technologies to obtain information that will be used by extensionists and producers.		
User Experience:	FONTAGRO currently has three prototype sensors that are in the experimental stage. The 30 short-cycle crop producers selected to validate the tool will receive the sensors, valued at US\$50-60 each, at no cost.		
Key Successes:	No successes were referenced by the interviewee given the early stages of the project.		
Key Challenges:	FONTAGRO identified the cost of the sensors as the main obstacle to promoting the use of this type of technology. There are other sensors in the market available at a much higher cost. Although farmers state an interest in using this kind of technology, FONTAGRO finds that farmers never actually do so given the elevated costs they entail.		

Demand Side Usage

Aside from selling input products and agricultural machinery to farmers, the agribusinesses interviewed predominantly use social media platforms, video conferencing software (Zoom), WhatsApp and SMS to provide extensive advisory services to farmers. All of the agribusinesses interviewed, with the exception of Olam and Pilonos y Flores SA (PYFLOR), provide farmer information services through these channels. Larger transnational agribusinesses like Cadelga, with some 900 permanent employees, for example, are able to maintain a customer service line through WhatsApp whereby customers can ask questions regarding the availability and use of agrochemical products (e.g.insecticides, pesticides, veterinary products, fertilizers and irrigation equipment, among others). Cadelga also provides customer service and advisory services through Facebook posts and Facebook Messenger, in addition to email. Cadelga’s extensive [web page](#) also provides farmers with information services on subjects like effective water usage and preventing and treating crop disease. Smaller, more mid-sized and localized agribusinesses, like SEAGRO and Del Campo Soluciones Agrícolas, with 50 and 70 employees respectively, are also able to offer advisory services to farmers through webinars on Facebook and Zoom as well as WhatsApp messaging or SMS blasts. Just at a glance of the varying Facebook pages and web pages, however, it is evident that larger agribusinesses like Cadelga have a greater capacity for offering regular advisory services to customers.

The desire to improve the quality of service provided to farmers in addition to increasing the number of customers and sales were identified as factors driving the adoption of digital tools and technologies by agribusinesses.

The use of these digital platforms to disseminate information to farmers has proven beneficial for the agribusinesses, and all of them shared that they plan to continue to use these mediums in addition to on-site visits in order to reach farmers.

The demand side actors providing advisory services to farmers include Agricenter, Del Campo Soluciones Agrícolas, SEAGRO, Cadelga, Dinant and Inversiones Amalgamadas S.A. de C.V. (Inalma), all of which cited farmer information services as the primary use case.

Challenges

Companies consulted identified connectivity and farmers' access to smartphones as key challenges to reaching farmers and customers. Without strong connectivity and smartphones, farmers do not have access to the many digital resources made available by agribusinesses, particularly via social media and WhatsApp. Weak connectivity also hinders the ability to use video conferencing software such as Zoom and access videos and stream webinars on Facebook. The lack of smartphones also makes it difficult to access digital tools, as basic and feature phones do not have the functionalities for mobile applications. Providing services to farmers in distant and hard-to-reach mountainous areas — both geographically and digitally — was further complicated by the COVID-19 pandemic. Lockdowns and social distancing prevented farmers without access to smartphones and connectivity from benefiting from the information services provided by agribusinesses. Aside from this, one agribusiness (Inalma) found some farmers to be hesitant to adopt the digital tools and services as well, reporting attitude and older age of customers to affect their willingness to change and use digital tools.

Market Linkage and E-Commerce

As many of the stakeholders involved in KIIs for this landscape were either agribusinesses or international development projects, a shared goal was improving market access for farmers. This has led to efforts to strengthen and improve market linkages with the support of digital technologies. Some market linkage efforts were basic in nature, providing access to shared directories of buyers and producers via email and WhatsApp. Most of the international development organizations mentioned in the above advisory have a market linkage component to their projects. The vast majority do not use e-commerce or online marketplaces, but simply connect buyers to farmers groups to communicate through WhatsApp. These services, while basic, are valuable and help disintermediate middlemen, which add costs and take value away from the prices SHFs receive. Some key takeaways from SIA's review of the various market linkage and e-commerce services can be found below.

Online market linkage solutions are not solutions for underlying market linkage challenges

There is one online marketplace, called [Olagro](#), dedicated to connecting smallholders to buyers. Olagro is funded by the European Union and run by an international development organization (details below). The platform has faced a myriad of challenges getting active usage after signing up 1,200 smallholder bean and maize farmers. Primary challenges are not

based in technology and the online platform itself, but rather in more traditional problems around aggregation, post harvest storage and transportation logistics that are simply not in place for SHFs and are necessary for the smooth adoption and use of an e-commerce platform.

WhatsApp as the e-commerce gateway

The majority of international development actors engaged in this landscape assessment have a primary objective of improving access to markets. Most activities focus more on the underlying issues of aggregation, quality control, post harvest storage and transportation at and off the farm and are not investing in e-commerce at the moment. Yet many projects have begun building buyer directories and connecting farmer groups and buyers via WhatsApp. Many project participants are using WhatsApp to send pictures of produce to buyers and line up sales. WhatsApp can perhaps be an introduction to the benefits of e-commerce long term.

Behavior change is challenging

Sube, an e-commerce platform that enables MSMEs to open online stores and process transactions, also offers monthly training through its academy. Many of its clients are unwilling to invest the time in understanding how e-commerce can benefit their businesses. People are often too busy or feel they do not have the time to invest in building an online presence. While COVID-19 has driven many MSMEs in the retail and restaurant industries to conduct business online, the agricultural sector has lagged behind.

Market Linkage and E-Commerce Deep Dives

This assessment interviewed two providers offering e-commerce or e-marketplace services to the agriculture sector in Honduras. Details of their services can be found below.

Name:	Olagro	Relevant Taxonomy Sub-Categories:	e-Marketplace Solution
Provider Type:	International Development Project (funded by the European Union)	Value Chain Focus:	Maize, beans
Target Clients:	Farmers, Buyers	# of Users (active):	1,200 (there is no active number, but it seems that very few, if any, are active)
User Growth (if applicable):	No user growth	Pricing (if applicable):	Free to farmers and buyers, paid for via project funding and supported also by the 23 municipalities it serves
Overview of Services:	Olagro is an online marketplace set up by a project funded by the European Union and focuses on 23 municipalities within the Olancho department. Olagro offers a place for bean and maize producers to place their products online, where buyers make purchases directly. The platform also attempts to organize transport and logistics to help fulfill orders. The marketplace was meant to support both direct sales with fixed prices in addition to online auctions. There have been some issues getting the platform off the ground, which will be discussed in the challenges section below.		

User Experience:	Farmers are able to register through the platform remotely, but the vast majority of platform participants have been signed up by project staff. Producers can communicate expected harvest numbers, and buyers are able to place orders or enter auctions via the platform. Everything is accessed through the portal which can be found here: https://olagro.org/ .
Key Successes:	While there has been very little activity, the sales that have been made helped facilitate better pricing for farmers. The interviewees stated that, on average, farmers were able to get 20% more for their crops.
Key Challenges:	Olagro has had a lot of challenges, resulting in a platform that is not very active. The platform has only made two sales since its launch in 2020. The primary issues were more traditional challenges of working with smallholders. Olagro found it difficult to aggregate and store produce. A major lesson learned from Olagro's experience is that e-commerce or online marketplaces may enable more direct communication between farmers and buyers, but it does not necessarily solve underlying issues such as post harvest storage, aggregation and organization of smallholder produce, or transportation issues. Although farmers can get more for their crop selling through Olagro, the process of selling the product and receiving payment is slower and small producers are in more immediate need of cash flow.

Name:	SUBE Latinoamérica	Relevant Taxonomy Sub-Categories:	E-commerce
Provider Type:	Technology Company	Value Chain Focus:	None
Target Clients:	While the platform is open to all sectors, Sube's primary clients are restaurant owners and retail stores	# of Users (active):	15,000
User Growth (if applicable):	Growth has been strong after the onset of COVID-19	Pricing (if applicable):	Three pricing plans: 1) The basic plan is 2,200 Lempira/month (US\$90); 2) the middle plan costs 3,100 Lempira/month (US\$125); 3) the highest plan costs 4,900 Lempira/month (US\$200/month). The primary difference between plans is the amount of products one can host on their online store, with the basic plan allowing 50 products and the highest plan allowing 2,000 products. The basic plan also limits a company's transactions to 50, while the other plans have unlimited transactions.
Overview of Services:	Sube provides MSMEs an easy way to start their e-commerce business, and its platform comes with training opportunities offered by the Sube Academy. While this platform is not necessarily geared towards the agricultural sector, a few producers have started online stores using the platform. TMS is using Sube to both train and establish online stores for select MSMEs it works with. Sube also offers payment services for its clients, which enables them to accept digital payments from a range of channels, including three banks and payment providers like Visa, Mastercard, Tingo and PayPal.		
User Experience:	MSMEs interested in starting an online store can register through the platform and immediately begin loading products and services. Training and support is provided through paid fixed monthly licenses (see pricing).		
Key Successes:	Sube's most successful companies have been in the retail and restaurant industry. Success is usually highly correlated to an informed and strategic manager who understands how to use the		

	platform in addition to acquiring a broader set of marketing and selling skills.
Key Challenges:	Behavioral change was mentioned as one of the biggest challenges Sube has faced in getting clients to be more engaged on their platform. Sube also mentioned connectivity was a major hurdle in rural areas, which prevented success for some of its clients in agriculture.

Demand Side Usage

As with other use cases of digital tools and technologies in the agricultural sector, e-commerce services are few in number. As previously mentioned, PYFLOR uses its own e-commerce platform to sell raw produce and processed goods to its customers. With a total of 110 employees, the agribusiness adopted this service to improve efficiency, service delivery and order automation and reduce lead times, errors and costs. To create its e-commerce platform, PYFLOR used the e-commerce creating services of Monkey Business Solutions with support from the TMS activity. Monkey Business Solutions provided its white-labeled e-commerce platform (Chatshop.store) and customized it to fit PYFLOR’s needs. SEAGRO, a smaller agribusiness with 50 employees, also makes use of an e-commerce platform to sell its products through its web page. The web page’s e-commerce platform is relatively new and was not brought up during interviews; its actual functionality remains questionable upon browsing the page. Cadelga, a much larger company, also employs the use of e-commerce services via its web page. Farmers can browse through different input products and purchase them online for delivery from different Cadelga stores. Cadelga contracted a web developer service non-specific to the agricultural sector to create its website. Beyond order placement through WhatsApp, phone calls and in-person encounters, other agribusinesses consulted do not employ the use of e-commerce platforms to sell products and the demand for these services is not demonstrated. This could be due to a lack of awareness about the possible application of e-commerce in the agricultural sector and its benefits, as agribusinesses do not seem to express interest in changing operating procedures when it comes to sales. The majority of agribusinesses in fact shared that things run smoothly as they are.

Supply Chain Management

Supply chain management services were being used almost exclusively by larger agribusinesses who built their own solutions and systems. This will be discussed in more detail in the demand side section below. While smaller organizations like cooperatives mostly have their accounting and inventory in some form of digital format (such as Excel or no-frills accounting software) there was very little awareness or demand for these types of services found down the value chain. There was also less of a supply for these types of services in the market that were appropriate and affordable for MSMEs. For example, the service highlighted in the deep dive below focuses on larger enterprise resource planning (ERP) solutions, like SAP, that are likely more fitting for mid- and large-sized companies.

Supply Chain Management Deep Dives

Name:	POPA Group	Relevant Taxonomy Sub-Categories:	Supply Chain ERP Solutions
Provider Type:	Technology Company	Value Chain Focus:	No specific focus
Target Clients:	Input Companies, Aquaculture, Food Processors, Coffee Agribusinesses	# of Users (active):	60 agriculture sector clients
User Growth (if applicable):	Users have grown by 5% annually in recent years	Pricing (if applicable):	No fixed pricing was provided; cost proposals are provided based on the needs of the company
Overview of Services:	POPA Group provides implementation services of the SAP Business One ERP solution. It works with clients to set up the SAP system, which can help companies manage inventory, accounting and sales and run operations using data driven decision-making. POPA licenses ERP products and supports companies during onboarding and initial implementation.		
User Experience:	Users access services via an online portal; data entry can also be done via apps on smartphones or tablets that feed into the main ERP system (i.e. inventory data). Although user experience requires connectivity, there is versatility in hardware used to access.		
Key Successes:	Clients experience efficiencies that lead to cost savings, improved inventory control and better financial management.		
Key Challenges:	The primary challenge faced by POPA clients is behavior change of staff of companies it works with. POPA also identified weak connectivity in different regions as a barrier in the uptake of the services.		

Demand Side Usage

All demand side actors consulted use digital tools and technologies to manage the flow of goods and services. One particularity to this practice was that rather than using supply chain management services from specific service providers in the agricultural sector, agribusinesses used custom software for accounting, inventory management, logistics, farmer database management and traceability, developed internally or by software engineers specifically for their companies. Larger agribusinesses interviewed, with upwards of 100 employees, were much more likely to have advanced and customized software than smaller agribusinesses, which have around 50 employees. These smaller organizations regularly employ the use of standard software such as Microsoft Suite and email to manage operations, and all of the agribusinesses interviewed expressed leveraging WhatsApp for internal and external communications and the management of operations.

The specific use cases of digital tools and technologies in supply chain management practiced by demand side actors include logistics, supply chain ERP solutions and traceability, and certification solutions. Some of the main factors agribusinesses identified as having played a role in the adoption of digital tools and technologies include improved inventory control and

maintenance, internal communication and business decision-making. SEAGRO, for example, fully digitized its accounting, inventory control, invoicing and ordering system through the use of a software developed by a Honduran software engineer. Transnational companies with much greater capacity and reach, such as Olam, have been able to digitize traceability of coffee crops from the production farm to the warehouse and then to the port of export. Internally, Olam developed its digital traceability platform, called Olam Farmer, which serves as a registry of all the producers it works with. Olam collects data including contact information, location coordinates, production practices and farm and crop details. The company's capacity has also allowed for the internal development of another digital platform, called Olam Direct, which pulls in the same data in addition to data on routes for the collection and transportation of coffee from farm to warehouse (in order to eliminate intermediaries).

Challenges

Although the majority of agribusinesses expressed that the internal rollout and uptake of digital tools has been quite easy and efficient, both mid-size and large transnational agribusinesses found the data digitization process to be time consuming and slow (Agricenter, Olam, Del Campo Soluciones Agrícolas, DINANT, Inalma). Upon digitization of this data, however, these companies found it efficient to operate supply chain management digitally. Some of the identified challenges around the use of these new digital tools include the hesitancy in uptake among older, middle-aged technicians (Cadelga, PYFLOR) and connectivity issues at certain times of the day due to power and coverage constraints in regions where certain crops like coffee are produced (Cadelga, Agricenter, PYFLOR, Inalma). In order to mitigate the challenge of staff hesitancy, agribusinesses relied heavily on continuous capacity building of staff, who eventually recognized the benefits of the tools' use.

Inalma also identified the elevated costs of these digital technologies as a challenge to overcome in the adoption of digital tools and services. The company also encountered connectivity issues at times and was not always able to access the tools.

Finance

According to World Bank's 2017 Findex data, Honduras has a national financial inclusion rate of 45%, while only 39% of the rural population has financial accounts. There is also a significant gender gap between men and women account ownership; 50% of men have accounts and only 41% of women own accounts. DFS and wider adoption of agency banking have helped extend services to previously underserved populations, but there is still a long way to go. This is particularly true for SHFs in the agricultural sector. Most farmers gain access to financial services via savings and credit cooperatives or banks with larger footprints, such as Banco de Occidente.

A report from CNBS found that mobile money and other e-money services like Tengo are indeed growing. E-money wallets grew 34% between 2019 and 2020, with COVID-19 pushing

more payments onto digital wallets. While the data from CNBS does not include active wallets vs. inactive wallets, it is a positive sign that so much growth occurred in just one year.

Financial institutions serving SHFs and other members of agricultural value chains do not deploy many digital solutions that serve the farmer. The vast majority of credit products rely on credit-bureau data and traditional underwriting processes (i.e. loan application and collateral auditing) that often exclude SHFs. Most of the banks interviewed for this assessment typically work with larger value chain actors and rarely focus on smallholders as credit, insurance or savings product clients. Savings and credit cooperatives are smallholders' primary financial service access points, but they often lack the resources to invest in alternative delivery channels like DFS. Some key takeaways from SIA's review of the various DFS can be found below.

Most DFS offered by banks in Honduras are only accessible through smartphones

The vast majority of services offered by banks do not use more basic access channels such as USSD. Like information services that only use WhatsApp, this means many rural SHFs do not have access to these types of services if they do not own a smartphone.

Mobile money has the most access points, but is also the most expensive

Tigo money, the country's leading mobile money service, has over 5,000 agents nationwide. This is by far the most amount of service points offered by a single provider. The primary issue with mobile money in Honduras is the price. Sending money using banks, MFIs or even cooperatives is nearly half the cost of sending money with mobile money.

Alternative credit products or digital credit products are non-existent

There are no data sharing agreements or pilots that use alternative data sets to assess creditworthiness occurring between banks and fintechs at the moment. Digital credit products have had some success in offering quick and fast small loans in other markets. While digital loans have had less success in the agricultural sector, there are data sharing partnerships that exist in some markets between agribusinesses and financial service providers. Financial service providers and agribusinesses seeking to support improved access to credit products for producers could benefit from exploring how data sharing could potentially unlock more credit opportunities for farmers whose digital footprints are becoming larger, but still can not provide the collateral requirements for traditional credit products.

Crop index insurance products exist but have experienced little uptake

Proagro and Banco Atlántida both offer crop insurance products, with a total of 11,500 hectares under coverage. Uptake of insurance has been difficult primarily due to the high premium costs. These costs are mainly a result of the high risk of rain fed agriculture, as well as high operational costs of actuary assessments on claims. While services like Proagro are adopting more digital tools such as satellite imagery and data from sources like INFOAGRO's Agromapas, they still send actuaries into the field to assess claims instead of enabling sensor, weather station and satellite data to issue pay outs. Continuing to strengthen the infrastructure that collects this data could decrease the costs of insurance.

Finance Deep Dives

The landscape spoke to a variety of financial service providers including banks, MFIs, cooperatives, insurance providers, e-money issuers (i.e. mobile money) and fintechs. Below are detailed summaries of the providers using digital channels to extend financial services to the agricultural sector.

Name:	Proagro	Relevant Taxonomy Sub-Categories:	Insurance
Provider Type:	Agribusiness	Value Chain Focus:	No specific focus
Target Clients:	Farmers (all sizes)	# of Users (active):	1,500 hectares under coverage
User Growth (if applicable):	Growth has been very difficult	Pricing (if applicable):	N/A as it is highly customized to the client
Overview of Services:	Proagro is an input distributor that has partnered with an insurance company to develop a variety of different index insurance products for its clients. Farmers can sign up for the insurance solution via Proagro's distributors and choose from 16 different policies that offer varying levels of protection. The service utilizes satellite imagery to provide data on rainfall and temperatures in the insured regions, which are coupled with field inspections when claims come in.		
User Experience:	Farmers register manually through Proagro agents. Premium payments are typically made via cash and payouts are usually distributed via bank transfer. Farmers receive information rainfall and updates on its policies via messages (WhatsApp, SMS). The onboarding process is fairly straightforward with plot information collected, including GPS coordinates.		
Key Successes:	Proagro indicated that there have been several occasions when claims have been reimbursed and farmers were able to replant.		
Key Challenges:	Proagro has had many challenges getting this service off the ground. The most difficult part of insurance companies is the inherently high risk involved in the agricultural space in Honduras. This leads to higher premiums, which are not affordable for most SHFs. There is also a high variability of rainfall across a specific zone, making some of the satellite imagery and weather station data less accurate, which may lead to farmers not receiving a payout when they should. Proagro cannot simply rely on satellite imagery and weather station data and must go into the field to collect actuary data when claims come in. This effort in addition to the high risk and manual premium payment collection adds to the high premium costs.		

Name:	Agrodigital Mi Caja Solution	Relevant Taxonomy Sub-Categories:	Savings
Provider Type:	International Development Project (funded by the Fondo Internacional de Desarrollo Agrícola [FIDA]) and Technology Company	Value Chain Focus:	No specific focus
Target Clients:	SHFs (over 80% of the savings group members Agrodigital works	# of Users (active):	1,800 individuals, who make up 66 different savings groups

	with are SHFs, the rest MSMEs)		
User Growth (if applicable):	The project has reached its goal of 66 groups, but FUNDER sees opportunity for further growth and is seeking a phase 2 to expand to another 70 groups. However, there is no private sector actor driving adoption, so it is entirely donor driven.	Pricing (if applicable):	Free of charge
Overview of Services:	Mi Caja is an application produced by Agrodigital for the FUNDER, funded by the Fondo Internacional de Desarrollo Agrícola (FIDA). The Mi Caja product is meant to help savings groups (cajas rurales) digitize bookkeeping and savings, replacing the commonly-used paper ledgers and allowing for members to have more vision into the transactions and balances of the group. At the moment, they are not integrated with banks or payment platforms such as Tigo Money.		
User Experience:	Savings groups are typically registered for the service via FUNDER staff members who work directly with the groups. Group members are able to record group transactions on the app, and track transactions, loan amounts and balances via the app. It requires a smart device to use, and FUNDER has provided tablets to all 66 groups.		
Key Successes:	Better administrative efficiency for savings groups and better controls and transparency for members has led to greater trust. The app has also helped reduce credit arrears, as it helped send reminder messages to members. All of this has led to greater confidence in group participation.		
Key Challenges:	The largest challenge encountered was access to smart devices. For this reason, FUNDER provided tablets for each group to manage the app. This then led to the second challenge, which was getting managerial staff trained on the use of the app. Digital literacy was a challenge, as many of the members had never navigated smart devices before. Also, since it's a smart device app, it was difficult for other members to access the information without a smartphone. There is no real sustainability plan for this product, so another challenge will be what happens after the program funding ends.		

Name:	Agromoney	Relevant Taxonomy Sub-Categories:	Credit
Provider Type:	Agribusinesses	Value Chain Focus:	Cadelga farmers
Target Clients:	Farmers	# of Users (active):	2,500 producers
User Growth (if applicable):	COVID has impacted the rollout of the Agromoney product	Pricing (if applicable):	3% per month
Overview of Services:	Developed by Cadelga, Agromoney is an input credit product developed to help extend credit services to its producers, who were having issues accessing credit. Cadelga built the product in partnership with IFC and has a microfinance institution within its larger group of companies. This service is only available to farmers who sell to Cadelga, but it enables an online application process. Farmers are able to register, apply and be approved for credit through an entirely digital process. Loan amounts range from US\$100 to US\$10,000, and target small- and medium-sized producers.		
User	Farmers interested in loans can send a WhatsApp message or Facebook message to the		

Experience:	Agromoney, and can then begin completing an application. Cadelga works through a network of input retailers to help finalize credit applications. Farmers receive the loans via bank transfer (bank accounts are required).
Key Successes:	A recent study on Agromoney's impact found that customers improved both the amount and quality of production thanks to the inputs they were able to purchase with the Agromoney credit solution. The study also found 60% of the producers were able to get a better price for their crops.
Key Challenges:	While the impact of the Agromoney credit product is obvious, it has been unable to scale to all farmers, as much of the underwriting process still depends on traditional credit decision-making inputs such as credit bureau/existing credit history, collateral and bank accounts. The product, while successful, is still difficult to access for farmers who do not have bank accounts or have not accessed credit in the past.

E-Money Wallet Providers in Honduras

There are two primary e-money providers in Honduras: Tigo Money and Tingo. Tigo Money is the mobile money wallet offered by the leading mobile network operator in Honduras, Tigo. Tingo is an affiliate of Ficohsa Bank and caters to a more urban clientele (its primary product is accessed through an app). Tigo Money has over 1.3 million registered users, 500,000 of them active.²⁷ It has 5,000 agents nationwide and the broadest coverage of financial service access points. Tigo is not commonly used in agricultural payments, as it is seen as expensive for moving money around. Tigo's pricing focuses on the withdrawal of funds, with the cheapest tier being 4% of the total amount withdrawn. Farmers often cannot afford adding this additional cost into their already small margins. Tingo has around 290,000 users (data on active vs. inactive users was unavailable), with around 2,000 service points around the country. Tingo is much more focused on enabling online payments, which may mean it becomes more relevant to the agricultural sector as it also moves more into selling online.

Digital Credit for Agriculture in Honduras

This assessment interviewed several financial institutions that were providing more traditional financial services to the agricultural sector, including savings and credit cooperatives and larger banks. These interviews did not uncover any real digital interactions with farmers aside from some loan applications received on tablets. Some cooperatives did have lending products that could use movable assets, such as tractors and other machinery, as collateral for credit products. However there were no credit products found that accepted cattle as movable asset collateral, which would allow farmers without machinery to participate.

Larger banks, such as Banco Atlántida and Banco de Occidente, typically provide credit to larger value chain stakeholders, while cooperatives deliver services to rural customers, such as farmers and MSMEs. The landscape did not uncover any data sharing partnerships between financial institutions and other data creators (i.e. agribusiness). Agromoney, mentioned above, is a special case, where the agribusiness is large enough to also have a licensed MFI. While innovative, Agromoney doesn't currently incorporate alternative credit scoring into its

²⁷ Interview with Tigo Money, 2021; active means 1 transaction per 30 days.

underwriting. Below are some findings on interest rates and customer profiles for the financial institutions engaged during the landscape.

Name	Provide Type	# of Ag Loan Customers	Interest Rate/Month	Customer Profile
COMPROIL	Cooperative	800	3%-7%	SHF/MSME
COMLESUL	Cooperative	3,500	3%-8%	SHF/MSME
CACIL	Cooperative	5,000	2%-6.8%	SHF/MSME
Banco Atlántida	Bank	750	3%-6%	Cooperatives/Value Chain Stakeholders
Banco de Occidente	Bank	6,200	2.5%-6%	MSMEs/Small and Medium Farmers

Demand Side Usage

Although the use of DFS was not largely prominent among the demand side actors consulted, four agribusinesses referenced the use of digital payments with their customers: Cadelga, Dinant, PYFLOR and Inalma. PYFLOR, dedicated to the production of greenhouses and sale of tomato, pepper and sweet potato seedlings, and Inalma, dedicated to the production and processing of cassava, plantains and sweet potato, are in fact companies included in the USAID/Honduras TMS activity's investment portfolio. Cadelga and PYFLOR, specifically, use their own e-commerce platforms to sell products and receive payments via digital bank transfer or credit and debit card. Through PYFLOR's web page the order is ultimately placed via WhatsApp, through which customers receive order confirmation and delivery details. Other agribusinesses interviewed have yet to digitize payments; this could largely be attributed to the lack of DFS in Honduras beyond Tigo Money and Tengo, which do not offer specific services for the agricultural sector.

Though not entirely digitized, several of the agribusinesses consulted do provide input credit to farmers through the banking system and with their own resources (Agricenter, Cadelga, Del Campo Soluciones Agrícolas, Olam, SEAGRO). Olam, notably, provides in-kind credit to farmers and credit to coffee buyers for the payment of the product upon delivery by the farmers. SEAGRO also provides credit for inputs to farmers with its own resources and through the banking system. The company shared that farmers must obtain bank credit to purchase agricultural machinery and equipment.

Ecosystem Support

This landscape encountered two organizations providing important digital agriculture ecosystem support services which enable other digital agriculture products to function. These services are both public goods and are implemented by government agencies.

The first of these services focuses on providing accurate weather information in Honduras. CENAOS is a government agency that runs 180 weather stations throughout the country. The

agency offers weather information directly to farmers and other digital agriculture services. Weather information includes rain, temperature and soil moisture where sensors exist.

The second public sector service that provides general ecosystem support for digital agriculture is the Instituto de la Propiedad (IP). This government agency runs both land and movable asset registries. IP provides ways to register property ownership online and manages the registry enabling over 1,500 different public and private sector stakeholders, such as banks, to access land ownership information.

Players such as CENAOS and IP are crucial data collectors and data producers for the digital agriculture sector in Honduras. Strengthening these institutions can help strengthen the overall enabling environment for digital agriculture solutions.

Conclusions and Recommendations

While digital agriculture is at a very nascent stage in Honduras, some of the larger market actors have become early adopters of digital transformation initiatives. The development sector has contributed to strong infrastructure for information service delivery, but can do additional work with digital agriculture technology providers to drive demand and open up market opportunities. The government should continue to be supported in building public goods such as meteorological services, sensor deployment and satellite data that can reduce barriers to entry and operational costs for younger technology companies interested in delivering digital agriculture services. To close, the below reiterates the key recommendations for both TMS and USAID/Honduras future activities from the aspect of supply, demand and supporting ecosystems.



Supply Side Recommendations

For TMS

- 1) Find partners beyond development actors. Work with digital agriculture solution developers such as Agrodigital to examine their interest in launching services targeting specific agriculture actors beyond development partners. Work through some of the entrepreneurial activities TMS is running to support capacity building and links to fundraising for tech companies interested in developing digital agriculture solutions.
- 2) Facilitate matchmaking between supply and demand-side actors. Provide supply side actors like Proagro and Disagro with marketing opportunities with producer organizations. Smaller solutions often lack the funds to market their services properly. TMS can provide support in aggregating potential demand and matching digital agriculture suppliers with clients.

- 3) Encourage factoring solutions for micro, small and medium enterprises (MSMEs) linked to e-commerce. Consider a discussion with current partner Sube on a credit product for its MSME partners using accounts receivable and transactional data to determine credit worthiness. Services that provide similar products to Sube, such as Shopify in the United States, have had great success in providing credit products for clients using their platform to sell products online. There could be an opportunity for Sube to consider this for its 15,000 users (some of which are in the agricultural sector).

For Future Programming

- 1) Encourage the development of services with potential for commercial viability. Incentivize projects to shift from building digital solutions that meet development programming needs (e.g. for monitoring and evaluation) to incentivizing private and public sector actors to build services that have the potential for commercial viability. Donor-funded programs should continue providing a good source of demand for digital agriculture solutions, but only as part of a broader set of customer segments. Any digital agriculture solutions that development partners wish to undertake should try to be sourced through a company that intends to deliver the service to other customer segments in the agricultural sector.
- 2) Centralize an open source agronomic advice library. Help standardize information by centralizing an open source agronomic advice library for Honduras. Information services are the most bountiful supply of digital agricultural services in Honduras. Yet the majority of these services are driven by international development programs, and each information service solution uses its own set of curriculum and messaging.
- 3) Support MSMEs to use messaging platforms for data collection. Consider supporting MSMEs to use messaging platforms for purposes beyond communication and as a means of data collection, which can lead to the adoption of other services (e.g. supply chain management or farm management). Messaging platforms like WhatsApp are widely used among value chain stakeholders and to some extent at the farmer level. These can be valuable tools in introducing additional layers of digital transformation.
- 4) Utilize blended finance approaches. Leverage blended finance approaches to establish guarantees for banks or microfinance institutions (MFIs) willing to explore the use of alternative credit scoring practices. This could bring in more clients who have previously been unable to meet collateral requirements for loans.



Demand Side Recommendations

For TMS

- 1) **Build digital capacity for MSMEs beyond e-commerce.** Continue building digital capacity among MSMEs through business development services, but include education on other digital agricultural services beyond e-commerce. While e-commerce is an important skill for many MSMEs, the logistics and supply chain infrastructure around smallholder farmers (SHFs) has a long way to go until they can participate in e-commerce. TMS could consider developing a tiered approach, depending on the maturity of the business, including modules that provide insights on how to track inventory and build out basic accounting records by using messaging platforms, simple data collection applications and cloud services from Google or Microsoft. Other modules can move on to more advanced usage of digital transformation services in accounting and supply chain management.
- 2) **Improve market research and segmentation to identify demand and market size.** Conduct digital needs assessments of mid- and downstream stakeholders of targeted agricultural value chains. TMS is in a unique position to tap its existing network of MSMEs to increase the understanding of where potential demand for digital agriculture services sits for this level of the market segment. A market study could provide some market sizing estimates, which could be used as an incentive for technology providers who have only been designing products and services when contracted (versus designing something for mass consumption). This type of market research could also be used to inform fundraising goals for technology companies interested in expanding services to the agricultural sector but lacking the funds to do so.

For Future Programming

- 1) **Encourage digital transformation at the cooperative level.** Cooperatives are the closest value chain stakeholder to farmers, and they are often key for accessing inputs as well as finding markets for crops. Some cooperatives have already begun their digital journeys by implementing core banking products that enable interaction between different branches. Yet there are other digital tools, particularly around inventory management and farmer coordination, that could help improve operational efficiencies.
- 2) **Increase awareness of digital tools and technologies.** Although the demand side's usage of digital tools and services in agriculture is relatively low, when agribusinesses cited how they learned about the availability of these tools and services they identified learning and networking events as well as personal connections. Hosting capacity building workshops and familiarizing agribusinesses with the available digital tools and services in their country and in the region could help increase their demand for these services. Agribusinesses must also be made aware of the effectiveness and benefits of these services—not just their availability. Raising awareness may also help agribusinesses recognize the value of investing in them.
- 3) **Build digital literacy.** Hesitancy to adopt and uptake digital tools among middle-aged employees and customers was one of the common challenges referenced by

agribusinesses. This reluctance may be explained by individuals' limited knowledge and lack of confidence in using these tools. In order to support agribusinesses' digital transformation, USAID activities should prioritize and continue to support the development of digital literacy in Honduras.



Ecosystem Support Recommendations

For Future Programming

- 1) **Strengthen data stewardship.** Monitoring and evaluation are crucial, and many development projects have detailed farmer databases. Information on production, plot location, input usage and other relevant agronomic data exists, but it is oftentimes fragmented across different donor-funded programs. This landscape assessment looked at a wide variety of programs that, when combined, have datasets on over 200,000 farmers. To improve the data ecosystem on SHFs in Honduras, the Mission should think about ways to incentivize its projects to consider ways to keep these databases live. Potential data partnerships could exist between private sector partners, such as input providers or agribusinesses purchasing produce, who are going through digital transformation processes and would have use for digitized farmer data. Donor-funded projects in particular, could consider ways to standardize datasets to help improve their portability. In addition to standardization, there should be additional support to build strong data protection protocols around the datasets. This would help establish specific data sharing frameworks to support the longevity of the data collected, while maintaining privacy and security standards, with a particular focus on data subjects.
- 2) **Strengthen public sector capacity in data management and information sharing.** While the private sector plays an essential role in ensuring digital agriculture solutions are delivered in a customer friendly manner, some of the data they will depend on should be coming from public sector-led initiatives. The meteorological government institution Centro de Estudios Atmosfericos, Oceanográficos y Sísmicos (CENAOS) has 180 weather stations around the country in addition to access to other remote sensors (e.g. satellite imagery) for weather forecasting. INFOAGRO and SIMPAH are also government-run programs that source market prices for crops and use satellite data to conduct soil maps. Future programs should continue to strengthen the data and information produced from these public institutions, while also encouraging public/private sector partnerships that enable private sector players access to quality information they can then disseminate to farmers in smart and innovative ways. This is especially important for index insurance providers who have trouble relying entirely on remote sensor data and still send actuaries into the field to assess claims.
- 3) **Strengthen movable asset registries.** The Instituto de la Propiedad (IP) has established a digital means of registering land into its system as well as movable assets such as machinery. Continuing to strengthen these types of registries can help smaller

producers utilize assets to gain access to credit. The Mission can also support IP in considering the registration of cattle as a movable property, which would expand the type of asset classes possible to use for collateral in the market.

Annex

Annex 1: Database of Stakeholders

#	Date	Organization/Company
1	October 13, 2021	ACDI/VOCA
2	October 18, 2021	Heifer International
3	October 19, 2021	Agricenter
4	October 19, 2021	Eurosan Occidente
5	October 19, 2021	Fintrac
6	October 19, 2021	Fundación para el Desarrollo Empresarial Rural (FUNDER)
7	October 21, 2021	ACS - PROSASUR
8	October 21, 2021	COMLESUL
9	October 21, 2021	Del Campo Soluciones Agrícolas
10	October 22, 2021	Disagro
11	October 22, 2021	FAO Investment Centre
12	October 26, 2021	COMPROIL
13	October 26, 2021	SEAGRO
14	October 27, 2021	PROAGRO
15	October 28, 2021	Instituto Hondureño del Café (IHCAFE)
16	November 1, 2021	Cadelga
17	November 2, 2021	COHONDUCAFE
18	November 4, 2021	Banco Atlántida
19	November 4, 2021	Olam
20	November 4, 2021	Tigo Money
21	November 8, 2021	Comisión Permanente de Contingencias (COPECO)
22	November 15, 2021	INFOAGRO - SIMPAH
23	November 18, 2021	MOCCA
24	November 19, 2021	Corporación DINANT
25	November 22, 2021	Cacil

26	November 22, 2021	Sube Latinoamérica
27	November 24, 2021	Instituto de la Propiedad (IP)
28	November 29, 2021	COMRURAL
29	November 29, 2021	PYFLOR
30	November 30, 2021	Grupo Popa
31	December 9, 2021	Inalma
32	December 10, 2021	Fontagro/Universidad de Zamorano

Annex 2: Digital Use Cases Present in Honduras

[View table in Google Sheets](#)

Use Cases	Sub Use Cases	Technology Providers					Other-donor funded agriculture programs: Agribusinesses												Government funded programs		
		Disagro	Grupo POPA	IBM Watson Decision for Agriculture	Proagro	Sube Latinoamérica	Eurosan	FAO	FONTAGRO	FUNDER	Prosur	Agricenter	Cadelga	Del Campo Soluciones Agrícolas	Dinant	Inalma	OLAM	Pyflor	SEAGRO	IHCAFE	INFOAGRO - SIMPAH
Advisory	Precision Agriculture Advisory	X		X																	
	Farmer Information Services								X	X	X	X	X	X	X			X	X	X	
	Participatory Advisory																				
Market Linkage & E-commerce	Farm Management																				
	Digitally enabled value chain integration																				
	Mechanisation access services																				
Supply Chain Management	E-commerce services					X	X											X			
	E-market places																				
	Traceability and certification																X				
Finance	Logistics											X	X	X	X	X	X	X	X		
	Supply chain ERP solutions		X											X	X	X		X	X		
	Quality assurance and counterfeiting																				
Ecosystem Support	Procurement																				
	Payments												X		X	X		X			
	Savings								X												
	Credits and Loans												X								
	Credit scoring																				
	Insurance				X																
Ecosystem Support	Financial analytics																				
	Crowdfunding																				
	FSP digitization																				
Ecosystem Support	-	X																			

Annex 3: KII Question Sets

These are the standard lists of questions asked during interviews. Given limitations around time and varying applicability, the question set was not always followed exactly as it is outlined below.

SUPPLY SIDE QUESTION SET

Introduction to Product

1. Please tell us about the product and the rationale for developing it.
 - a. What are the key challenges this product is trying to overcome?
 - b. Who are the target users, and how did you design for them? (B2B vs. B2C)
 - c. Is it geared toward specific value chains and, if so, which ones?
2. What hardware does the product require? (Tablets, smartphones, basic phones, laptop/desktops)
3. What institutions funded/invested in tool development? What is their current role?

Product Details

4. Does this product integrate with other platforms (e.g. WhatsApp)? Please describe.
5. Please describe the network requirements for the product to function (e.g. offline, 2G)
6. Please tell us about user security on the product.
7. What data is collected, and how is it secured? (e.g. advanced firewalls, intrusion detection, event logging, internal firewalls, encryption)
8. Who owns the data?
9. What customer support features exist? (e.g. call center, in-person field staff)

User Uptake

10. How is the tool rolled out to users?
 - a. Is training needed, and if so, what is the estimated training time/# of sessions needed?
 - b. Do you supply hardware to any users?
11. How many users does it have?
 - a. Active users?
 - b. By type (e.g. farmer, agribusiness)? By gender?
 - c. By region? (If they don't know #s by division, get at least the divisions with active users)
12. Are there specific customer segments your organization is focusing on? Which ones and why?
13. What successes/results has the tool realized? (i.e. in uptake, on agricultural productivity and income)
14. What challenges have you experienced with the rollout of the tool?

Costs and Revenue-Making

15. How do you calculate the revenue the tool brings to your business?
16. What was the tool's total revenue in 2020?
 - a. If they do not wish to say, can they share if they had net positive revenues, or tell us about how that figure is changing?
17. What is your average revenue per user per year?
 - a. If they do not wish to say, can they share if they had net positive revenues/user, or tell us about how that figure is changing?
 - b. Does this number change as you grow?
 - c. Does it grow large or smaller as your customer base grows, or does it stay the same?
18. What is your customer acquisition cost?
 - a. If they do not wish to say, what types of costs go into customer acquisition?
19. What are your other ongoing costs, including ongoing customer service costs, per year?
 - a. If they do not wish to say, what types of ongoing costs do they have?
20. Is your net margin currently positive or negative? Would you be willing to give a range of your net margin?
 - a. Trying to get to: What is your net margin?

Growth

21. What has growth (# users, revenue) looked like for you over the past several years (up to three if available)?
22. Do you have plans to reach more users? Please describe. In your value chains vs. sell the tool to other agribusinesses?
23. How have you developed financial projections for the tool? How do you use them on an ongoing basis?
 - a. Trying to get to: Do you have an active business plan?
24. Please describe what you see as the Total Addressable Market (TAM) for this tool. What is your target customer mix?
25. How do you segment this TAM for planning purposes?
26. What competitor digital tools are you aware of, if any? How is your product differentiated?

Regulatory Environment

27. Are there specific regulations that present challenges to your service?

Last Thoughts

28. Is there anything else you think we should know? Advice to USAID?

DEMAND SIDE QUESTION SET

Background Info

1. Please give us a quick overview of your work. Please cite where you work with women and youth.
2. How many employees do you have?
3. Agribusinesses: What types of financial services do your farmers use? Do you offer any of those services to them (e.g. credit for inputs)?
4. Have you tried using digital technology before?
 - a. *If no then move to the "Does Not Use Digital Tools/Services" questionnaire*

Description of Digital Services

5. Please tell us about the different digital tools and services your organization uses.
6. How did you hear/learn about the digital services you are using?
7. What factors led your organization to adopt these digital services?
8. Did you ever discontinue using a digital tool or service? If so, what was it and why did you stop using it?

UX/Hardware

9. Can you discuss the user experience of the digital service?
10. What hardware requirements does the digital tool have?
11. Do you find it easy to use? If yes, why; if no, why?

Rollout and Uptake

12. Can you tell us how you came to start using the digital solution(s)? What problems were you trying to solve?
13. What was the biggest incentive for taking on/transitioning to the use of digital agriculture tools in your work?
14. What was the uptake like within your company? How did you train staff? How did you deal with behavior change issues, if applicable?
15. How would you rate your organization's use of the digital service(s)?

Challenges

16. Beside any challenges you cited before in uptake, have there been other challenges in rolling these digital services out?
 - a. Staff uptake?
 - b. Data Entry?
 - c. Connectivity?
 - d. Cost?
17. How could these challenges best be mitigated?

Benefits

18. What would you say have been the greatest benefits you have gotten from the use of the digital tools? (Ensure we are capturing their thoughts on each digital tool they use)
19. Have these tools helped improve your decision-making as a business? If yes, how so?

20. What other benefits do you hope to accomplish from using digital tools?
21. Do you plan to use the digital service long term? Is it part of your company's success now?

Last Thoughts

22. Is there anything else you think we should know? Advice to USAID?
-

FINANCIAL SERVICE PROVIDER QUESTION SET

BANKS / MFIS

Ag Products and Customers

(Examples of ag products: payments, savings, credits and loans, credit scoring, insurance, financial analytics, crowdfunding)

1. What type of product offerings do you have for the agricultural sector? Which of these are delivered or offered digitally?
2. How many customers do you have (by product)?
3. Who are your customers? (e.g. farmers, MSMEs, etc.)
4. Describe your typical loan terms for the agricultural sector (rate, length, fees, collateral).
5. How much is your lending portfolio annually?
6. How many lending customers do you have?
7. How much in deposits do you have from rural customers?
8. Any interest rate given for savings?
9. Number of insurance customers?
10. Total hectares insured (if possible)?
11. Where are the majority of your agriculture customers located?

Service Delivery Challenges

12. Can you speak to some of the challenges you have faced in serving agriculture clients?
13. How do you address these challenges?

Digital Services

14. Do you offer any digital services for the customers we just discussed?
 - a. If yes, please describe your digital services.
 - b. If yes, how do you facilitate the distribution of these services? Do you have an agent network?
 - c. If not, please discuss why you have yet to utilize digital services to reach customers.

Lending Data Partnerships

15. What sort of data needs are you missing, or do many potential customers not have when making lending decisions?
16. Do you ever utilize third party data for lending decisions?
 - a. If not, why not?
 - b. If not, would you consider it? If yes, then what information would you need to make an informed decision?
 - c. If yes, who are your third party partners?
 - d. If yes, what sort of data sharing frameworks do you use?
 - e. If yes, what sort of data are you leveraging?
 - f. If yes, how are you leveraging the data?
 - g. If yes, what is the commercial agreement to use the data?

MOBILE NETWORK OPERATIONS

1. Can you share any type of connectivity map that shows where your network reaches?
2. What % of the population do you cover with 2G?
3. What % of the population do you cover with 3G?
4. What % of the population do you cover with 4G?
5. How many airtime distributors do you have?
6. Data costs (we can likely get a hold of these from public sources)
7. Key challenges in serving more rural customers

General Agriculture Services

8. Do you have any agriculture specific offerings?
 - a. If yes, what are they, how many customers, etc.
 - b. If not, why not?

Mobile Money

9. How many active customers (30 days) do you have?
10. Does your mobile money wallet have any agriculture specific services integrated with it?
11. Do you have any agriculture specific services through your mobile wallet?
12. How many active agents do you have? Do you have a breakdown of their locations? % in urban areas?
13. What is the volume and value of funds your platform processes on average monthly?
14. Do you have any products that work specifically with rural savings groups?