



FERTILE GROUND SERIES:

A 2016 Tanzania Ecosystem Review & Strategic Perspective on Digital Financial Services for Smallholder Farmers

July 2016

A white paper prepared by the Mercy Corps AgriFin Accelerate program for The MasterCard Foundation.



List of Acronyms/Specialized Terminology

AD	Alternative Data
AFA	AgriFin Accelerate program of Mercy Corps, supported by The MasterCard Foundation
AGRA	Alliance for Green Revolution in Africa
AMCO	Agricultural Marketing Cooperative
B2B	Business to business payment
B2C	Business to consumer payment
BoT	Bank of Tanzania
CGAP	Consultative Group to Assist the Poor
Co-ops	Agricultural Cooperatives
CRDB	Cooperative Rural Development Bank
FBME	Federal Bank of the Middle East
DFS	Digital Financial Services
DIS	Digital Information Services (non-financial)
EADD	East Africa Dairy Development
EFT	Electronic Funds Transfer
FAO	Food and Agriculture Organization of the United Nations
FSDT	Financial Services Deepening Trust of Tanzania
FSP	Formal Financial Service Providers
G2G	Government-to-Government Payment
G2P	Government to Person Payment
GoT	Government of Tanzania
GSMA	Groupe Speciale Mobile Association
ICRW	International Center for Research on Women
ICT	Information and Communication Technology
MAFC	Ministry of Agriculture, Food and Cooperatives
MCF	The MasterCard Foundation
MFI	Microfinance Institution
MNO	Mobile Network Operator
MSD	Market System Development Approach
NBC	National Bank of Commerce
NBFI	Non-Bank Financial Institutions
NMB	National Microfinance Bank TLC
OTC	Over-the-Counter (unregistered) use of digital financial services
PPI	Progress out of Poverty Index
SACCO	Savings and Credit Co-operative Societies
SHF	Smallholder Farmer
TCRA	Tanzania Communications Regulation Authority
VAS	Value-Added Service Provider
VICOBA	Village Community Banks
VSLA	Voluntary Savings and Loan Association

Key Country Statistics

Figure 1: Tanzania General Indicators (2016) ¹²

Indicator	Unit	Tanzania
Population ¹	#	55,070,654
Rural Population ¹	% Population	80%
Female Population ¹	% Population	50%
Population ages below 15 ¹	% Population	44%
Population ages 15 - 64 ¹	% Population	52%
Population ages > 65 ¹	% Population	3.10%
Below poverty	% Population	83%
GDP per capita ²	\$	\$864

Figure 2: Tanzania Key Financial Inclusion Indicators for Population over 16 or 18 years³⁴⁵⁶

Indicator	Unit	Tanzania
Financial Access Points ²	#	113,060
Commercial bank branches	per 100k adults	2.3
No. of Bank Accounts ³	% age 16+	9.00%
No. of Mobile Money Accounts ³	% age 16+	61.00%
No. of Mobile Money Accounts ¹	#	16.5 M
No. of Nonbank Financial Institution Accounts	% age 16+	1%
Saved at a financial institution ³	% age 16+	30.40%
Saved any money ³	% age 16+	87.80%
Within 5 kms. Of a financial access point ³	% age 16+	37.40%

Figure 3: Mobile Network Operator Market share for Voice and Mobile Money⁷

¹ UN Department of Economics and Social Affairs, Report 2016

² World Bank, 2016

³ Tanzania Communications Regulatory Authority. March 2016 Quarterly Statistical Report <http://www.tcra.go.tz/images/documents/telecommunication/CommStatMarch16.pdf>

⁴ FSDT. Financial Access Maps. 2014.

⁵ FSDT. FinScope Tanzania. 2013.

⁶ Financial Inclusion Insights. InterMedia. 2015.

⁷ Tanzania Communications Regulatory Authority. March 2016 Quarterly Statistical Report

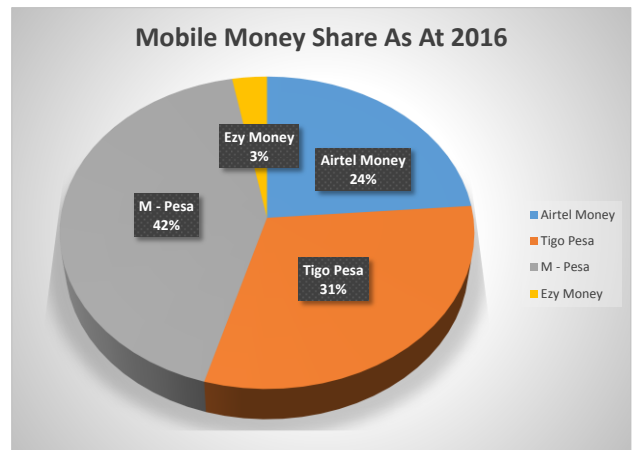
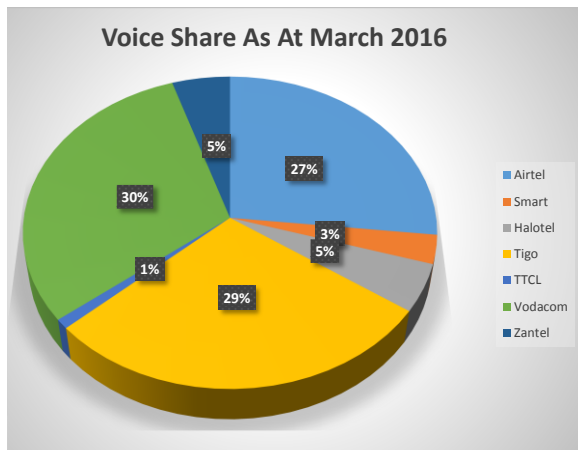
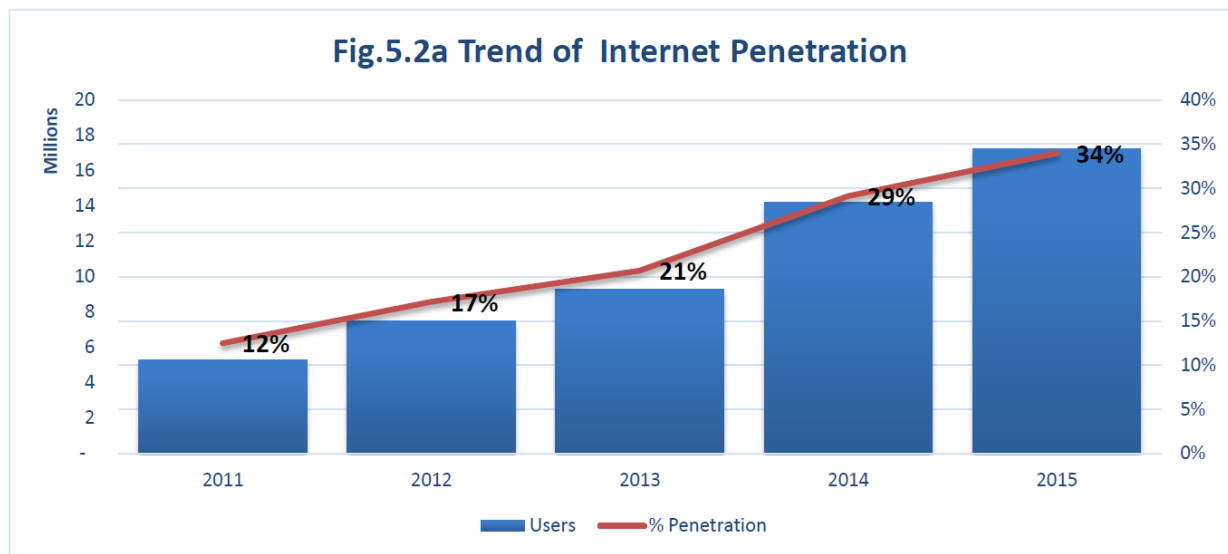


Figure 4: Telecommunications Trends for Subscriptions and Teledensity⁸

Year	2010	2011	2012	2013	2104	2015
Fixed	124,511	161,063	176,367	164,999	142,950	142,819
Mobile	20,983,853	25,666,455	27,450,789	27,442,823	32,108,851	39,665,600
Total	23,158,364	25,827,518	27,627,156	27,607,822	34,251,801	39,808,419
Penetration	50%	59%	61%	61%	71%	79%

Figure 5: Trend of Internet Penetration in Tanzania⁹



⁸ Tanzania Communications Regulatory Authority. March 2016 Quarterly Statistical Report

⁹ Ibid.

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Introduction to the White Paper

In 2015, Mercy Corps launched the AgriFin Accelerate Program, supported by The MasterCard Foundation. AgriFin Accelerate (AFA) is a six year, \$25 million initiative to support the expansion of digital financial and non-financial services to smallholder farmers (SHF) living on less than \$2.50 per day as measured with the Progress out of Poverty Index (PPI) in Kenya, Tanzania and Zambia (www.mercycorpsafrica.org). Building on learning from Mercy Corps' AgriFin Mobile program¹⁰ operating in Zimbabwe, Uganda and Indonesia, as well as our ongoing work in Kenya, the program seeks to increase farmer income and productivity through the development of well-designed and accessible digital financial services, bundled with productivity tools and services. AFA pursues its goal by working as an innovation partner with private sector actors committed to expanding delivery of services, particularly financial services, to smallholder farmers (SHF) on digital channels.

AgriFin Accelerate Theory of Change

IF **well-designed and accessible digital financial services** are bundled with **productivity tools** and offered to smallholders AND **mobile ecosystems** are accelerated to effectively provide those services to smallholder farmers at scale THEN **financial inclusion will increase**, driving gains for farmer income and productivity with:

- Best product design will result from **farmer-centric design thinking** and **rapid iteration**
- **Bundling** will build farmer trust, reduce costs, and create shared value for partners

To build a strong evidence base, AFA conducts a country-level ecosystem study with strategic learning partner, Dalberg Global Development Advisors, upon inception of each country program. The ecosystem study provides the core framework for decision making, including selection of value chains, partners and key strategic inflection points that will have greatest impact on SHFs. The ecosystem studies are complemented by annual representative farmer benchmark studies and client-centric research, to ensure that current farmer needs and effective demand inform program direction.

This White Paper outlines the major findings of the AFA Tanzania Ecosystem study conducted over a four-month period from late 2015 to early 2016, including desk research, expert interviews and farmer focus group discussions. The paper is targeted at institutions working to provide digital financial (DFS) and non-financial services for smallholder farmers, as well as enabling actors including donors, investors and government bodies, in the hope the information can support the increased range, scale and quality of services offered. The paper is organized into the following sections: 1) Introduction to the White Paper; 2) Executive Summary; 3) Tanzanian Agriculture and the Smallholder Farmer; 4) Ecosystem Assessment; and 5) Opportunity Identification and Conclusion.

Through our program activities and generated learnings, Mercy Corps supports the development of vibrant ecosystems of digitally-enabled financial and agricultural services. Armed with evidence of farmer need and the models and approaches that can improve efficiency, impact and viable businesses that serve them, we hope that a wide variety of private and public ecosystem stakeholders will “crowd-in” to the DFS sector, ultimately enhancing options and driving growth for smallholders.

¹⁰ a 6-year initiative

Executive Summary

Nearly one and a half billion poor people live on less than US\$1.25 a day.¹¹ One billion of them live in rural areas where agriculture is their main source of livelihood. For the 70 million smallholder farmers living in Sub Saharan Africa, half of them women, farm productivity is only 56% of the world's average. Still, smallholders, who typically farm two hectares or less, provide over 80% of the food consumed in a large part of the developing world, contributing significantly to poverty reduction and food security.¹² Increasing fragmentation of landholdings, coupled with reduced investment support, growing competition for land and water, rising input prices, lack of farm-to-market infrastructure and climate change threaten this contribution, leaving many smallholders increasingly vulnerable.

SHFs are also the most underserved group in the world by financial services, with women and youth at a particular disadvantage.¹³ The main barriers to financial access include the costs and risk associated with serving remote areas and small scale farming. Investment in this sector is critical, however, as economic growth from agriculture is at least twice as effective in reducing poverty as growth in other sectors.¹⁴ At an estimated \$450 billion, the global demand for smallholder agricultural finance is largely unmet. Impact-driven agricultural lenders are estimated to reach no more than two percent of demand.¹⁵

Given rapidly-growing penetration of mobile networks across Africa, digital technology can be a powerful tool to reach smallholders with information, market linkages and financial services at lower costs and at scale. A 2013 McKinsey study on Africa estimates that mobile and internet technology can drive up to \$3 billion in annual agricultural productivity gains by 2025.¹⁶ However, McKinsey points to the specific scale challenge for mobile agriculture services, recommending focus on the full ecosystem around farmers, including warehousing, logistics, finance and insurance to drive a critical mass of uptake. It is difficult for a single player to achieve scale in this space on its own. Partnerships and high functioning market ecosystems are essential to build sustainable and efficient agricultural markets.¹⁷ While technology alone cannot solve all the problems facing smallholders, strategic applications and use cases may be able help bridge some of the important barriers to serving them. Successful models, however, remain to be developed.

The core problem the AgriFin Accelerate program (AFA) seeks to address is the inclusion gap for SHFs who lack access to affordable, accessible, demand-driven financial products and services to drive higher productivity and income across Kenya, Tanzania, and Zambia. The diversity in country contexts will enable the program to introduce and prove new models across countries that are at different stages of maturity in the development of DFS. AFA is focused on understanding how providers can leverage technology to surmount the high costs and risks of serving farmers. The ecosystems required to serve smallholders are both complex and fragmented. Market actors are often hampered by lack of strong understanding of smallholder needs and are therefore unable to design impactful products, channels and other services for them. At the same time, farmers often lack the information, trust and capacity to access and productively utilize new products and tools.

This White Paper outlines the major findings of the AFA Tanzania Ecosystem Study (TES) which was conducted from September 2015 to January 2016 with Dalberg Global Development Advisors on behalf of the program and The MasterCard Foundation. The study takes an ecosystem approach to understanding the

Definitions: *An ecosystem is an economic community of interacting organizations and individuals. The community produces goods and services of value to customers, who are also members of the ecosystem.*

¹¹ IFAD, Smallholders, Food Security, and the Environment, 2013.

¹² Peck, Anderson, "Segmentation of Smallholder Households: Meeting the Range of Financial Needs in Agricultural Families", 2013.

¹³ Ibid.

¹⁴ Agriculture sector strategy 2010–2014, African Development Bank; World development report 2008: Agriculture for development, World Bank.

¹⁵ Dahlberg, "Catalyzing Smallholder Agricultural Finance", 2013.

¹⁶ McKinsey, "Lions Go Digital; The Internet's Transformative Potential in Africa", 2013.

¹⁷ Grossman & Tarazi, "Serving Smallholder Farmers: Recent Developments in Digital Finance", CGAP Focus Note, June 2014.

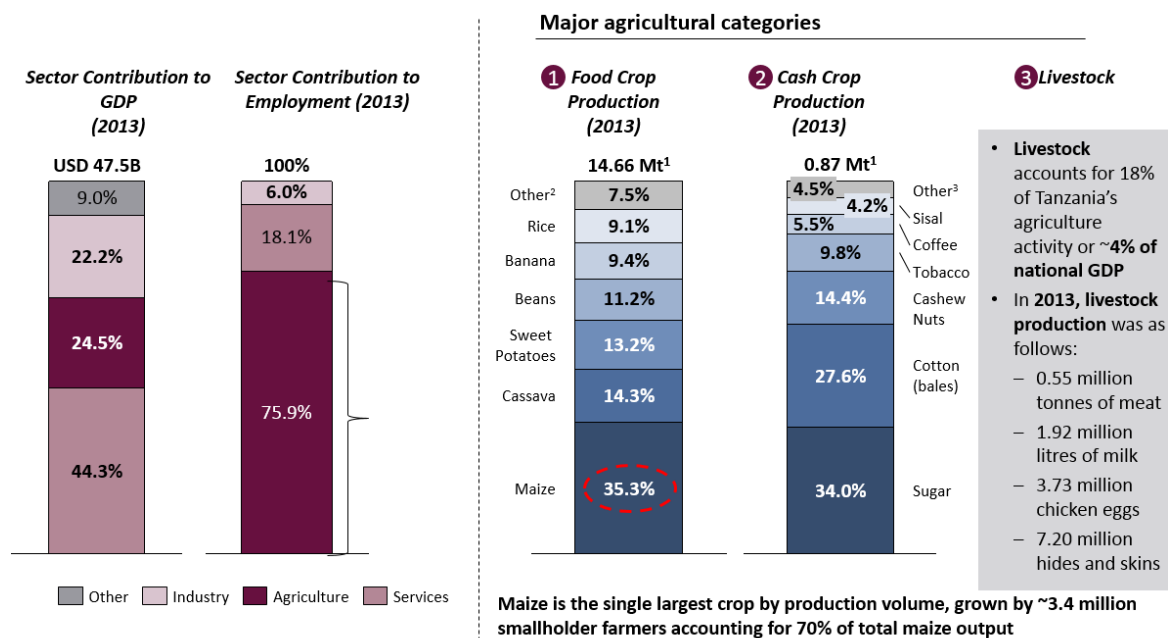
market landscape and farmer needs, which includes, but is not limited to, value chain analysis. Ecosystem analysis allows AFA to contextualize impact, defining what a mature, well-functioning digital services ecosystem requires to drive understanding of where AFA can contribute with meaningful impact.

The study included a desk review of existing literature, expert interviews and farmer focus group discussions. A key objective of the White Paper is to share findings to inform the work of institutions seeking to provide digital financial and non-financial services for smallholder farmers, as well as the funders and policy-makers engaged in this space. Our Kenya Ecosystem Study was completed in 2015 and will follow in Zambia in late 2016, combined with annual, representative farmer benchmark studies in each country, which will also be made public.

Key Study Findings: Fertile Ground

AFA has selected Tanzania as a major focal country due to its vibrant, innovative and competitive market for digital financial services (DFS) and the importance of agriculture, set within a context of high poverty and human need. Tanzania is one of the most politically stable countries in East Africa and has been a strong center of economic growth, with 7% average annual GDP growth over the past decade.¹⁸ Main export incomes are from cash crops like sugar, tea and tobacco alongside gold and tourism. Nevertheless, poverty is still exceedingly high at 83% and as of 2012, only 15% of the population had access to electricity.¹⁹ Overall, Tanzania is ranked 159th of 187 countries evaluated in the United Nation’s Human Development Index, mainly linked to indicators in poverty, health and education.²⁰ A predominantly rural country, Tanzania has 95 million hectares of land, of which half are classified as arable—but only 27% is actually under cultivation. Over 80% of cultivated land (by area) is worked by smallholder farmers (SHF). In Tanzania, agriculture is one of the most important sectors, contributing significantly to the economy and income for more than 75% of the population, as illustrated in the following table.

Table 1: Agricultural Contribution to Tanzania GDP & Major Crop Categories²¹



¹⁸World Bank, 2013. <http://www.worldbank.org/en/country/tanzania/overview>

¹⁹ World Bank, 2012. <http://www.worldbank.org/en/country/tanzania/overview>

²⁰ United National Human Development Index 2014. <http://hdr.undp.org/en/content/human-development-index-hdi>

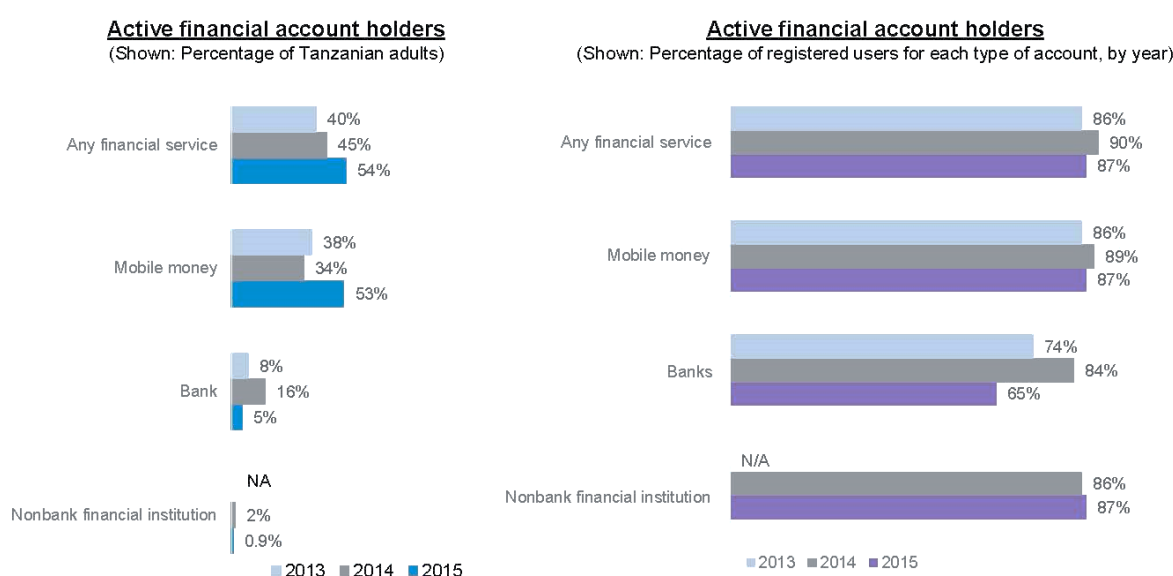
²¹ Agis Analysis; “Statistical Abstract”, Tanzanian National Bureau of Statistics, 2013

Financial Inclusion and Digital Financial Services

The financial sector in Tanzania is concentrated around a few large banks, but also includes many smaller players. The country has over 50 commercial banks, possibly the largest number in East Africa, alongside rural and community banks, microfinance institutions (MFIs) and savings and credit co-operative societies (SACCOS). They are, however, for the most part relatively small and branch density at 2.2 per 100,000 inhabitants is low. Three commercial banks, the Cooperative Rural Development Bank (CRDB), National Microfinance Bank (NMB) and Federal Bank of the Middle East (FBME) have nearly 50% of the market share in terms of assets and the top ten banks hold a combined 80%, with over forty others sharing the remaining fifth.²²

Financial inclusion has made remarkable strides over the past decade. In 2009, more than half of Tanzanian were excluded from both formal and informal financial services. By 2015, nearly two-thirds of adults were registered users of financial accounts. This progress was to a very great extent driven by the rapid expansion of digital financial services (DFS), following its initial introduction in 2008 by Vodacom through mobile money, or services which utilize mobile phones to access financial services (GSMA). Mobile money is quickly becoming the main, almost sole, pillar of financial inclusion, with useage far surpassing that of banks and non-bank financial institutions (NBFIs).

Figure 6: Levels of Financial Account Holders and Active Users (2015)²³



Types of accounts are not mutually exclusive.

Source: InterMedia Tanzania FI Tracker surveys Wave 1 (N=2,997, 15+), November 2013-March 2014; Wave 2 (N=3,000 15+), August-October 2014; Wave 3 (N=3,001, 15+), September-October 2015.

Over the past five years, the digital financial services (DFS) market in Tanzania has grown to rival neighboring Kenya, and with a more balanced market structure and major advances in interoperability linking more than 25 banks and three MNOs to the flow of mobile money.²⁴ While the share of population actively using the services (63%) is still slightly lower than Kenya's, the total value transacted has reportedly surpassed that of its northern neighbor.²⁵ More importantly, the market is highly competitive, with six registered mobile money service providers, including market leader Vodacom aggressively chased by Tigo and Airtel, and leading banks.²⁶ Ongoing improvements in the ecosystem for interoperability, including Vodacom's recent integration have also boosted usage. A robust range of

²² FinScope Tanzania 2013

²³ Financial Inclusion Insights, InterMedia 2015.

²⁴ <http://allafrica.com/stories/201602290717.html>

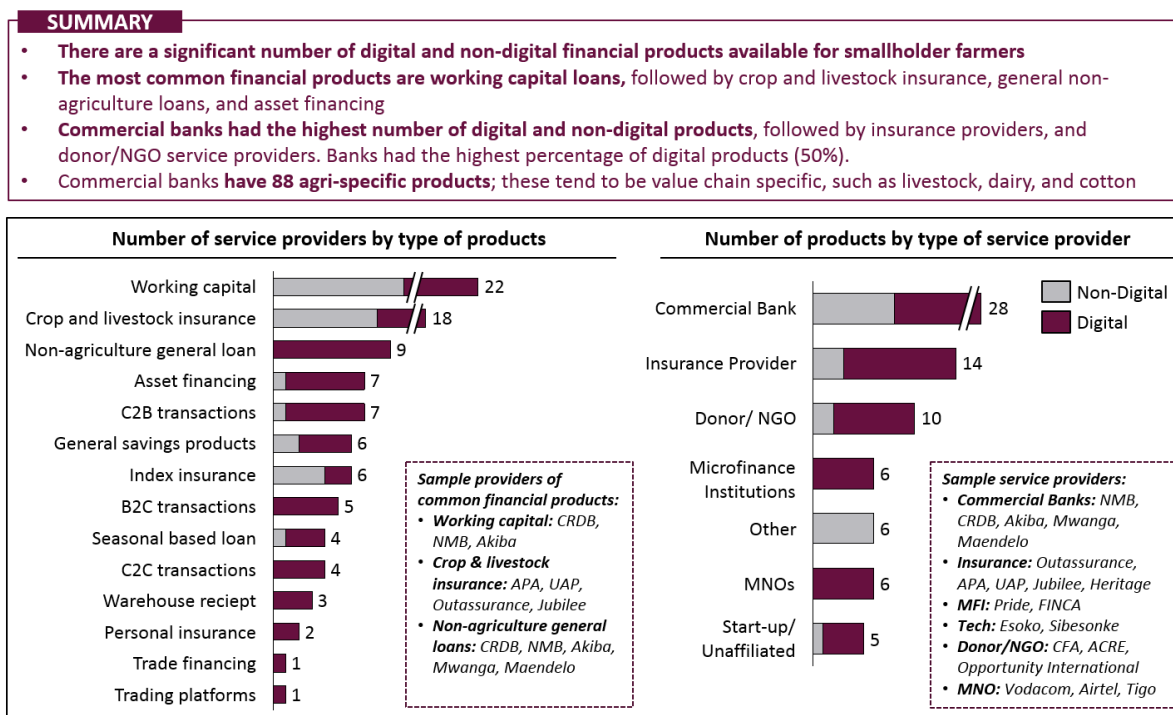
²⁵ www.cgap.org/blog/tanzania-africa-s-other-mobile-money-juggernaut, Zetterli 2015.

²⁶ Financial Inclusion Insights, InterMedia 2015.

shared agent networks and payment aggregators combine with DFS providers to offer agents numbering in the tens of thousands. Notably, nearly three quarters of agents are not exclusive but serve multiple providers, providing more access and choice for consumers.²⁷

Advances are attributable almost entirely to mobile money, with 61% of adults registered for accounts, while 8% of the adult population hold bank accounts and only 1% other nonbank financial institution accounts. Use of banks and NBFIs declined slightly from 2014 to 2015, with the most significant decreases in rural areas, which are turning increasingly to mobile money.²⁸ The following table presents a broad range of 95 digitally-enabled financial products currently being offered across 75 institutions in the Tanzanian market targeted to SHF.

Figure 7: Digital Financial Services Targeting SHF²⁹



Impressive strides have been made over the past two years alone in terms of account ownership for traditionally marginalized groups including women, the poor and rural populations. Important advances have also been made in the the deepening of financial inclusion, with three quarters of active account holders using advanced mobile money functions, including bill pay and savings, although access to loans and insurance remains extremely low.³⁰ Most mobile money use is now through a registered account, with unregistered use of financial services, or over-the-counter (OTC) transactions, having reduced significantly.

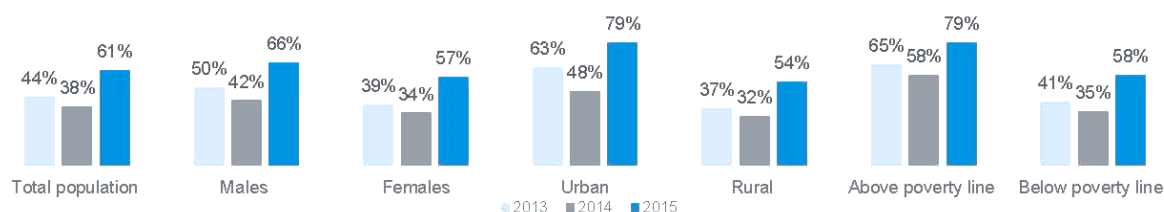
²⁷ AFA Ecosystem Study, Dalberg 2016.

²⁸ Financial Inclusion Insights, InterMedia 2015.

²⁹ AFA Tanzania Ecosystem Study, Dalberg 2016.

³⁰ InterMedia 2015.

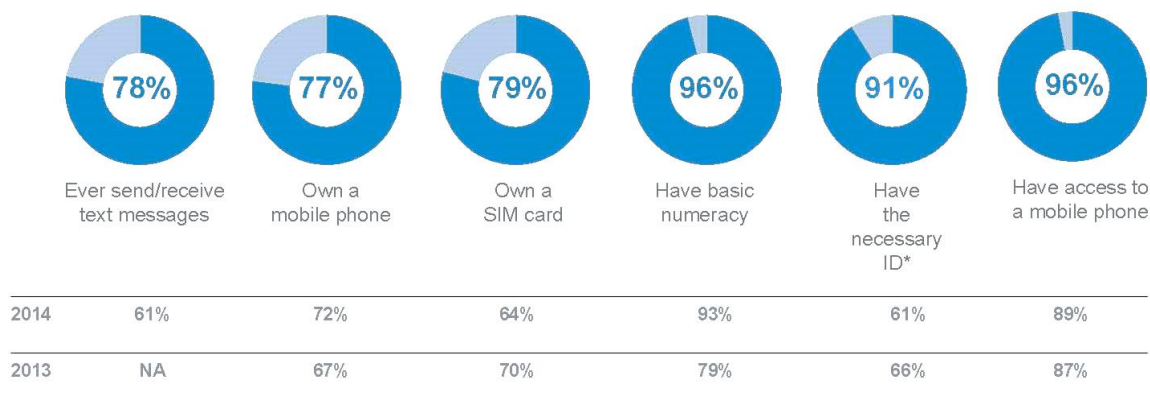
Figure 8: Demographic trends for all registered mobile money account users



Rural populations have shown particularly high increases in access and use of financial services, mainly mobile money. Now, nearly all Tanzanians know of at least one mobile money provider, and for every five people who know of mobile money, three use it.³¹ Still, the benefits of the past decade of growth have not been distributed equitably. Inequality has increased between urban and rural population and approximately 12 million Tanzanians are still living in poverty.³² In terms of agriculture, nearly 50% of agribusinesses and smallholder farmers do not use any form of financial product or service.³³ Rural women, who make up more than 70% of the agricultural workforce, are still at a significant disadvantage, particularly in terms of active use of accounts.

Women constitute an important opportunity for DFS in Tanzania. Studies do find that women who own mobile phones are very likely to become active mobile money users. As of 2015, 49% of women in Tanzania were active mobile money users.³⁴ And while women have also traditionally had lower access to mobile phone, 2015 data shows very important advances in access to mobile phones and the necessary identification to register an account, which should lay the groundwork for continued increases and is a strong opportunity for financial inclusion and service growth. The following table presents overall indicators for overall preparedness for DFS in Tanzania (note: necessary ID parameters listed in annexes).³⁵

Figure 9: Key Indicators of preparedness for digital financial services



Understanding SHFs

One of the likely causes of the disconnect between a relatively robust number of providers and products for SHF and effective uptake of formal financial services at bank and NBFIs may be weak understanding of SHF needs, preferences and behaviors and related product offer. AFA embraces farmer-centric design in our work with partners. Early results from human centered research shows that farmers are

³¹ InterMedia 2015.

³² World Bank, 2015.

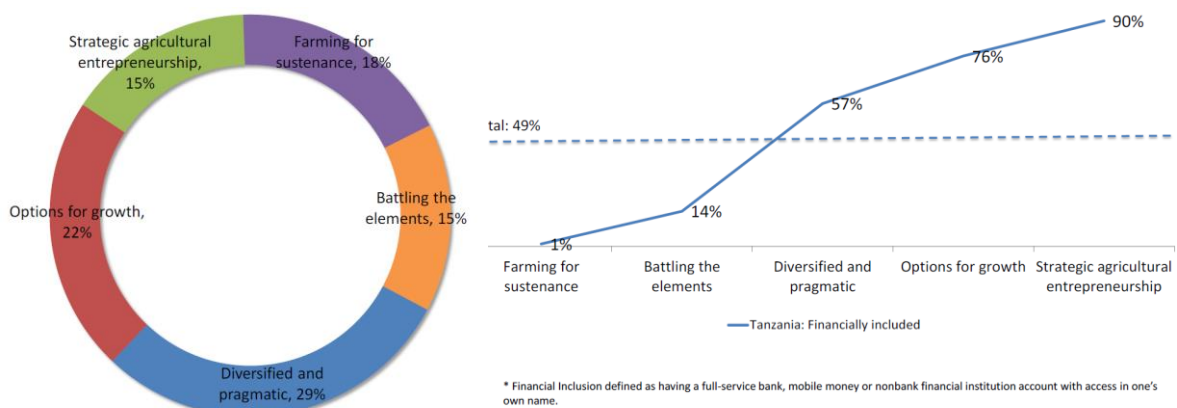
³³ Financial Inclusion Insights, InterMedia 2015

³⁴ Ibid.

³⁵ Ibid.

far from monolithic as a market segment and a deep understanding of different profiles of farmers is needed to get products and delivery strategies right. The National Survey and Segmentation of Smallholder Households in Tanzania, completed in 2016 by CGAP and the Financial Services Deepening Trust of Tanzania (FSDT), developed the following segmentation framework for the countries' 6.1 million SHF families. The following tables demonstrate the increasing access to finance for more diversified and educated households, while noting that 85% of all SHF households live below the poverty line of \$2.50 per day and 55% are extremely poor living on under \$1.25 per day.³⁶

Figure 10: Tanzanian Farmer Segmentation and Related Financial Inclusion



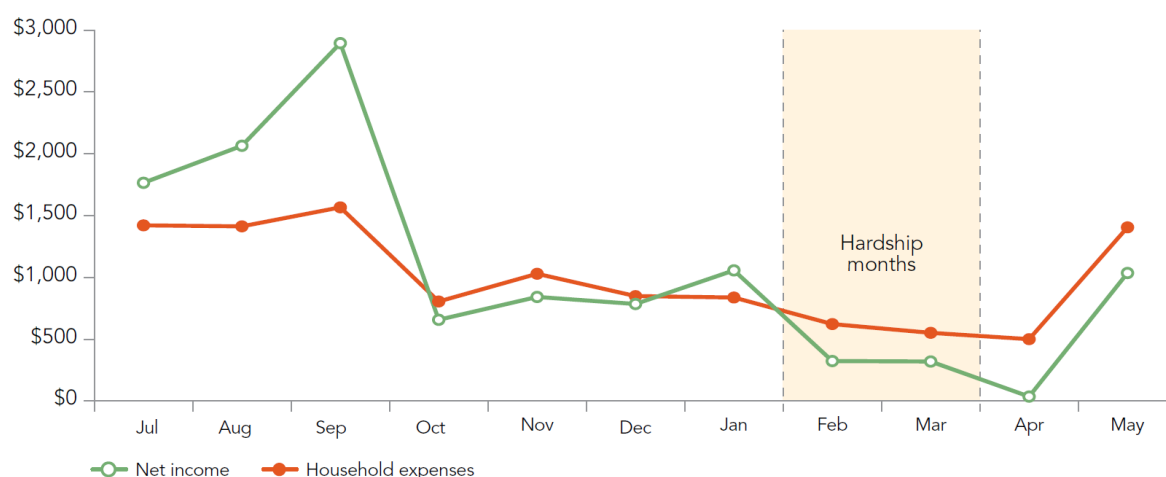
CGAP's Smallholder Diaries, completed in Tanzania from 2014 to 2016, also provide particularly important insights into the needs and behaviors of smallholder families. The Diaries find that SHF households typically have multiple agricultural activities and 11 different sources of income with a mix of farm and non-farm sources. Farming provides less cash (26% of total cash income) but very important in-kind income through consumption (46% of total cash and in-kind).³⁷ The Diaries also found that smallholder households in the Tanzania sample were "net sellers" in loose value chains, or that they sold more of their agricultural output than they consumed. With highly irregular income, households work to store crops as a form of savings, consuming some proportion over time, but also monetizing when needed. Agricultural production income is more volatile than other sources of income across the Smallholder Diaries sample, leading to increased farmer vulnerability. The use of digital financial services to help farmers increase investments and smooth income during planting and hardship seasons would be important advances for DFS.³⁸

³⁶ National Survey and Segmentation of Smallholder Households in Tanzania. CGAP 2016.

³⁷ Smallholder Diaries: Building the Evidence Base with Farming Families in Mozambique, Tanzania and Pakistan. CGAP, Anderson and Ahmed, 2016.

³⁸ Smallholder Diaries: Building the Evidence Base with Farming Families in Mozambique, Tanzania and Pakistan. CGAP, Anderson and Ahmed, 2016.

Figure 11: Tanzania Smallholder Diaries, rice product village: Net income and household expenditures.



a. The green income line refers to net income. For agricultural production, and small businesses in particular, income refers to revenue less related expenditures. The red expenses line refers to operational expenses of the household separate from income or financial transactions (e.g., spending on groceries, clothes, education, transportation).

The CGAP Farmer Diaries also explored the nature of shocks which these households face, led by agricultural input price increases and crop price decreases, crops being destroyed by pests in storage or being destroyed by weather. Farm families typically did not have clear coping tools to address these risks, relying mainly on short-term savings, stored crops and livestock and access to informal sources of funds through friends, family and savings groups. While 74% of the farmers indicated a desire to use mobile money, only 19% of farmers actually used mobile money.³⁹

CGAP's Financial Diaries concludes that while financial institutions and DFS providers remain important tools to explore and expand for SHF use, they must be carefully targeted to smallholder profiles.⁴⁰ Closer connections to buyers and aggregators in the value chain could benefit Tanzanian smallholders, facilitating and digitizing purchase agreements or contracts, for example, against which farmers could borrow for inputs and make payments on mobile devices. Leading agricultural buyers in Tanzania, including the World Food Program, are exploring these types of arrangements for smallholders. Safe storage methods to allow farmers to both ensure consumption and realize improved sales margins are also important opportunities to help smallholders increase incomes.⁴¹

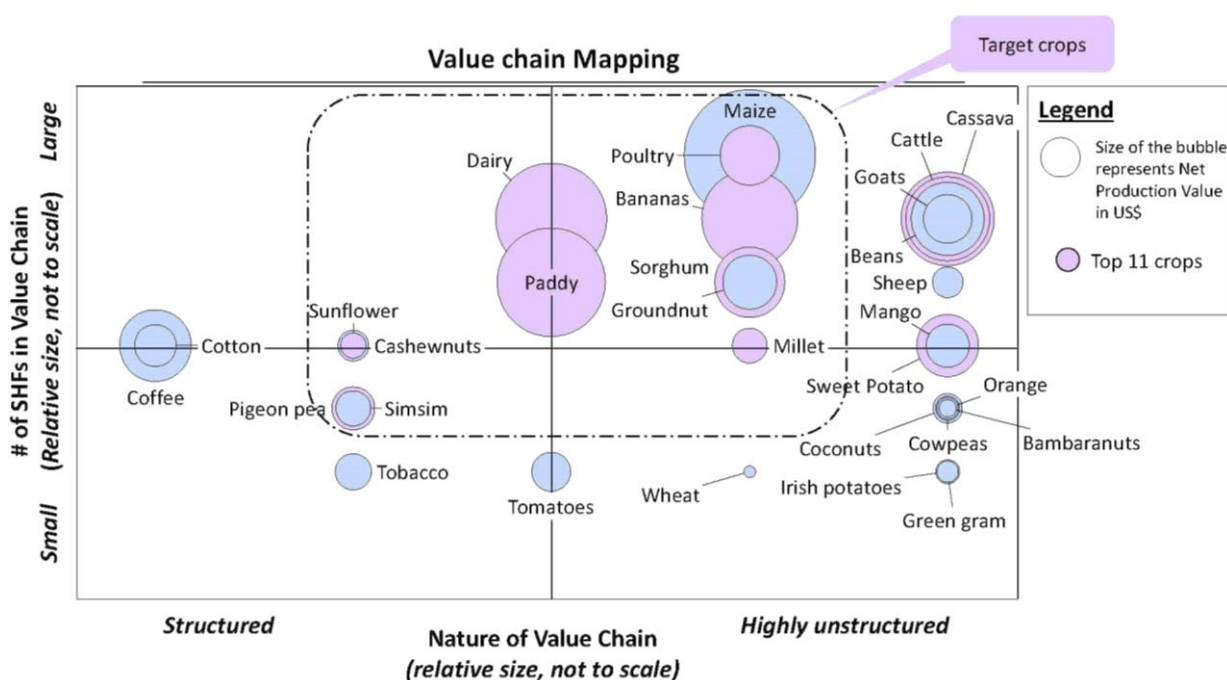
Serving SHF is a complex puzzle for providers. However, real market opportunities await the providers who can break through to successful service delivery to smallholders. Value chain (VC) analysis reveals the millions of SHF working across a spectrum of structured to highly unstructured agricultural activities. Based on our analysis of these VCs against key criteria, AFA program has selected focal crops in order to help drive scale of outreach and impact. These crops include, dairy, poultry, cashews and chick peas, collectively engaging more than six million SHF. A snapshot of the key value chains reviewed is included below.

³⁹ Ibid.

⁴⁰ Smallholder Diaries: Building the Evidence Base with Farming Families in Mozambique, Tanzania and Pakistan. CGAP, Anderson and Ahmed, 2016.

⁴¹ World Food Program, Patient Procurement Platform: <https://www.growafrica.com>

Figure 12: Tanzania Ecosystem Value Chain Mapping



Value Added-Services

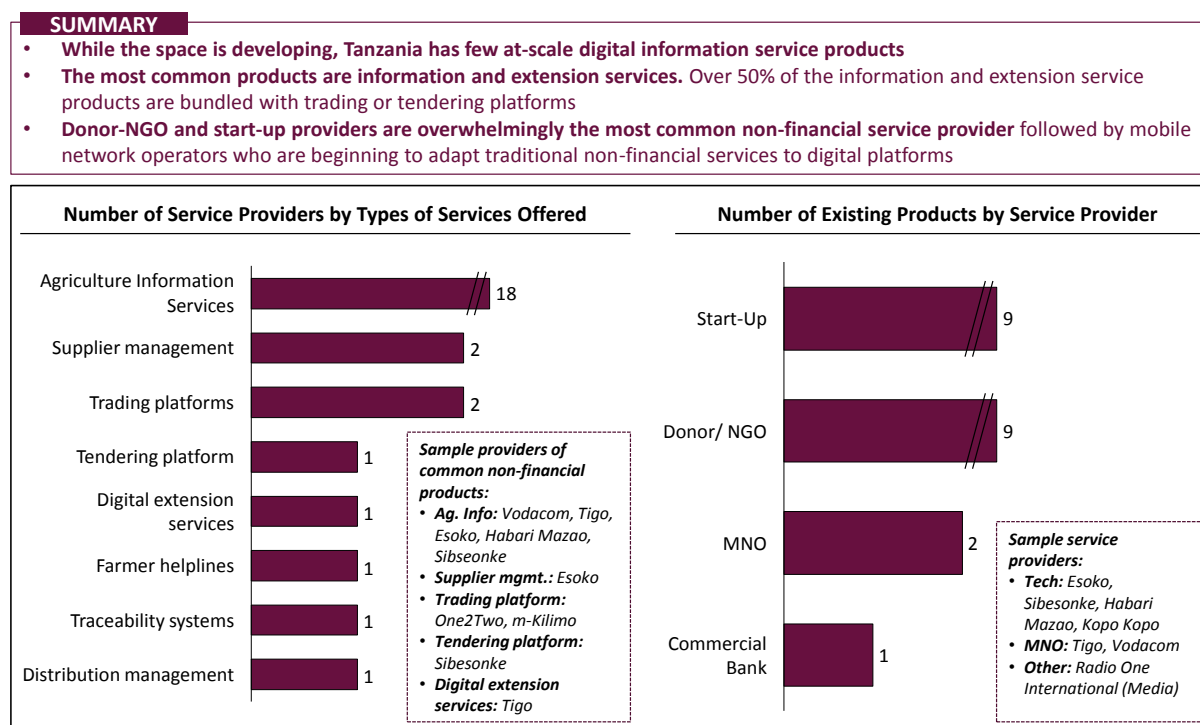
A critical driver for the innovation to transform services for SHF are emerging technology companies focused on solving the tough problems faced in agriculture, including access to markets, information, improved inputs and infrastructure. Tanzania’s high degree of competition among DFS players is already driving both growth and innovation and the country is already a focal point in Africa for experimentation, with products like m-Pawa (4.8 million subscribers)⁴² and Tigo Pesa’s nano loans.⁴³ Companies providing direct services for farmers such as Sibesonke and Arifu, alternative data providers such First Access and other innovators including Juntos and Acre Africa are also laying the groundwork for successful, and impactful service to SHF. The market still lacks, however, successful business models and impact proof points to drive the scale needed to overcome the huge and complex environment for millions of Tanzanian smallholders.

While DFS are rapidly evolving, digital non-financial services or agricultural value-added services (VAS) are still relatively limited in Tanzania compared with other leading markets in Africa. Over the course of this study, 27 different VAS providers were identified, the most common are information and extension services, such as agricultural tips, links to market information and pricing, as presented in the table below. To date, linkages between VAS and DFS are still very limited.

⁴² “Tanzania: Vodacom M-Pawa Loans Reach 4.2 Billion/ - in May 2016” <http://allafrica.com/stories/201606290073.html>”, July 2016.

⁴³ “Tigo Tanzania launches 'nano lending' scheme” <https://www.finextra.com/pressarticle/63613/tigo-tanzania-launches-nano-lending-scheme>, March 2016.

Figure 13: Digital Non-Financial Services Targeting SHF⁴⁴



While investment and support for technology innovators and VAS providers has been lower than in Kenya and Uganda in recent years, we expect to see the ecosystem of support for Tanzanian companies increase in the coming years. The landscape of organisations providing funding and technical assistance to technology innovators is also relatively nascent in Tanzania, but government, impact investors, academic institutions and technology hubs such as Buni Innovation Hub, Kinu and TanzICT are increasingly supporting growth in this area.

Conclusions and Opportunities

The stage in Tanzania is clearly set for increased advances in DFS for the countries' most underserved populations, including SHF, women and the poor. The country does face, though, a range of challenges in driving innovative service for smallholders, including development of relevant products for farmers with low and irregular incomes, addressing significant infrastructure constraints (including roads, transparent markets, agent networks, etc.), increasing agricultural productivity and incorporating a fast-growing young labor force (adding approximately 800,000 workers every year) which is increasingly turning away from agriculture.⁴⁵ Important opportunities, however, are also present. Tanzania holds great promise for advances in digital financial and non-financial service delivery for smallholders, particularly women, with many of the necessary building blocks around market acceptance in place. Advances in active use of digital financial services, meaningful engagement of major buyers like the World Food Program, growing rural agent networks and increasing interoperability of digital financial services among mobile money schemes and some banks, for example, put Tanzania at the global forefront of an expansion of services that could transform smallholders.

In conclusion, though in early stages of ecosystem development, Tanzania is fertile ground for meaningful innovation and expansion of DFS. A broad ecosystem of support actors in the private sector buyers and suppliers, farmer organizations, government, donors and investors, technology innovators and NGOs are mobilizing around technology as an enabler. Key unmet needs include bridging the product gap to make DFS relevant and help for smallholders, addressing farm income smoothing and

⁴⁴ AFA Tanzania Ecosystem Study, Dalberg 2016.

⁴⁵ World Bank 2016.

productivity needs, supported by requirements and pricing that SHF can realistically accept. There are also behavioral and attitudinal barriers for farmers, particularly for women, which need to be addressed during product design to ensure uptake and active use. Improved non-financial services, particularly given weak extension support for farmers, can augment both the access to and impact of financial services. Recent trends to incorporate human centered design into product development, led by CGAP and others, have yielded promising results in developing more holistic solutions for farmers and farm families, while also leveraging learning and innovation from outside the worlds of development finance. Breakthroughs of these types will need to be tried and tested through multiple iterations in order to develop successful models that can serve more marginalized farmers, including women and youth.

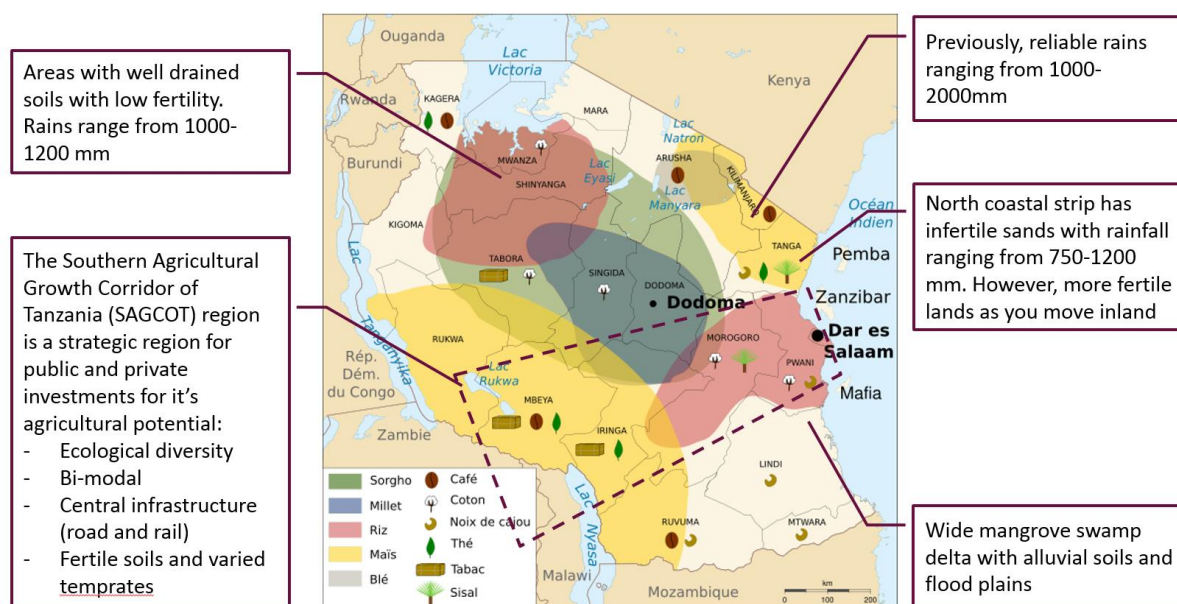
Ecosystem enablers, including donors, investors, buyers and government, are vital the development of DFS for farmers. The digitization of value chain and government payment flows through mobile money via agent networks and trusted farmer service points such as agro dealers and agrovets could present major impetus for improvement and is increasingly realistic. Investment and support for technology innovators and improvements in interoperability between digital actors can also be drivers to create more efficient flows of service across rural areas. There is also very important work to be done in unstructured value chains where farmers most acutely lack access to service, including finance.

We look forward to working with the sector to develop this fertile ground.

Tanzanian Agriculture and the Smallholder

Tanzania has a population of 55 million people and is divided into 30 regions, 25 on the mainland, and five on the island of Zanzibar.⁴⁶ By 2016, teledensity reached 79% of the population, making important inroads into rural areas.⁴⁷ As of 2015, GDP reached 44.89 billion USD, with a growth rate of 7% and per capita GDP of USD 864.9.⁴⁸ For the country's 6.1 million rural households, however, incomes are much lower.⁴⁹ CGAP's 2016 Financial Diaries for Tanzanian SHF presented annual earnings closer to \$314 per person.⁵⁰ The following map shows the major agricultural areas and key features.

Figure 14: Tanzanian Map of Agricultural Regions



Smallholder families in Tanzania predominantly grow food and staple crops. According to a new national farmer survey managed by CGAP with support from the Financial Sector Deepening Trust of Tanzania (FSDT), 63% of smallholder farmers reported they grow only staple crops, 1% grow only cash crops, and 37% grow both types. Maize, which is reported by 62% of the study's respondents as the most important crop to their families, is the most commonly grown staple crop at 90% of all farmers. Maize is followed by beans (44%), cassava (37%), sweet potatoes (28%), paddy rice (29%), groundnuts (26%), bananas (14%), sorghum (11%), pigeon peas (10%) and others. Of those percentages of staple crops, each is consumed, sold or traded as follows:⁵¹

⁴⁶ UN Department of Economics and Social Affairs, Report 2016

⁴⁷ Tanzania Communications Regulatory Authority. March 2016 Quarterly Statistical Report

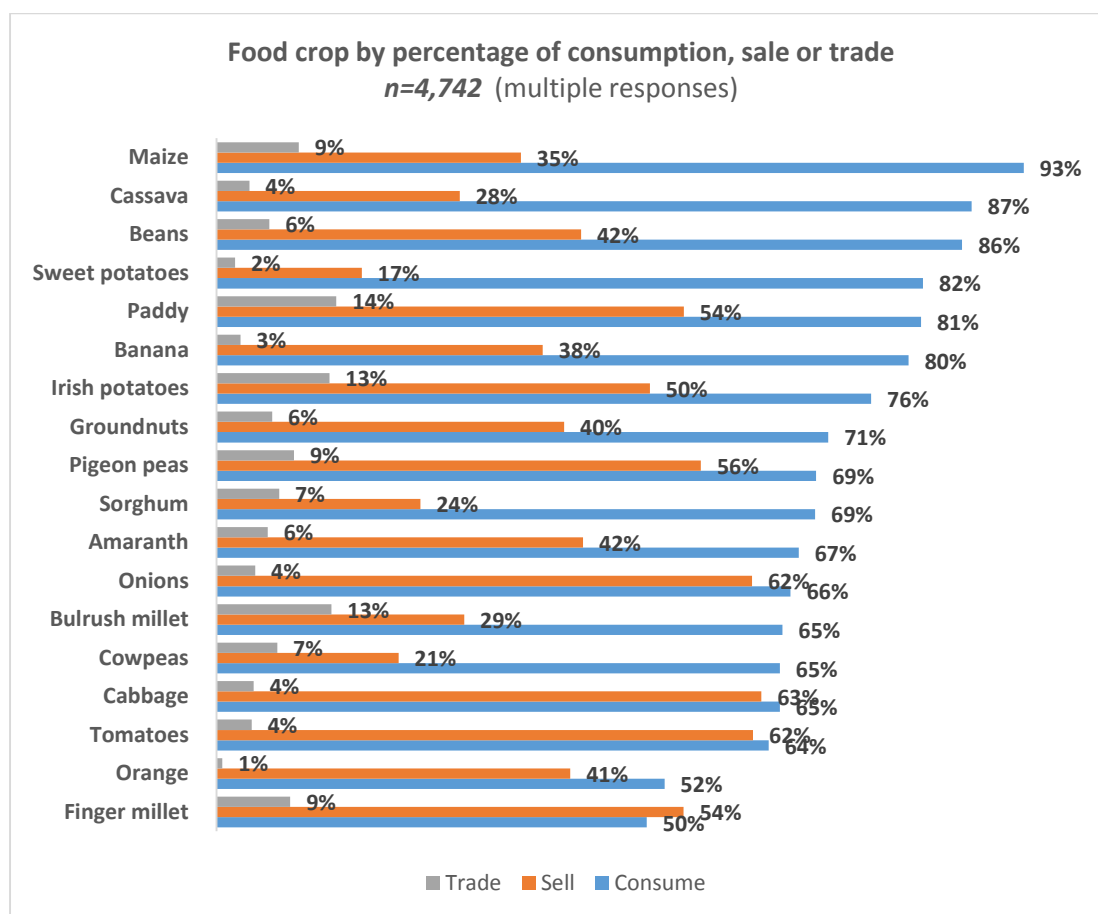
⁴⁸ World Bank 2015 Statistics. <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

⁴⁹ Tanzanian census, 2012.

⁵⁰ Smallholder Diaries, Building the Evidence Base with Farming Families in Mozambique, Tanzania and Pakistan. CGAP, Anderson and Ahmed. 2016.

⁵¹ CGAP, National Survey and Segmentation of Smallholder Households Report, 2016

Figure 15: Food crop by percentage of consumption, sale or trade



Only small percentages of smallholder farmers grow cash crops, such as sunflower (16%), sim (9%), coffee (5%), cotton (4%) and cashew nut (4%). Most of these cash crops are sold, though 58% of SHF that grow sunflower also consume it.⁵² AFA’s investigation into the maize value chain suggests that some maize farmers are moving into sunflower production.

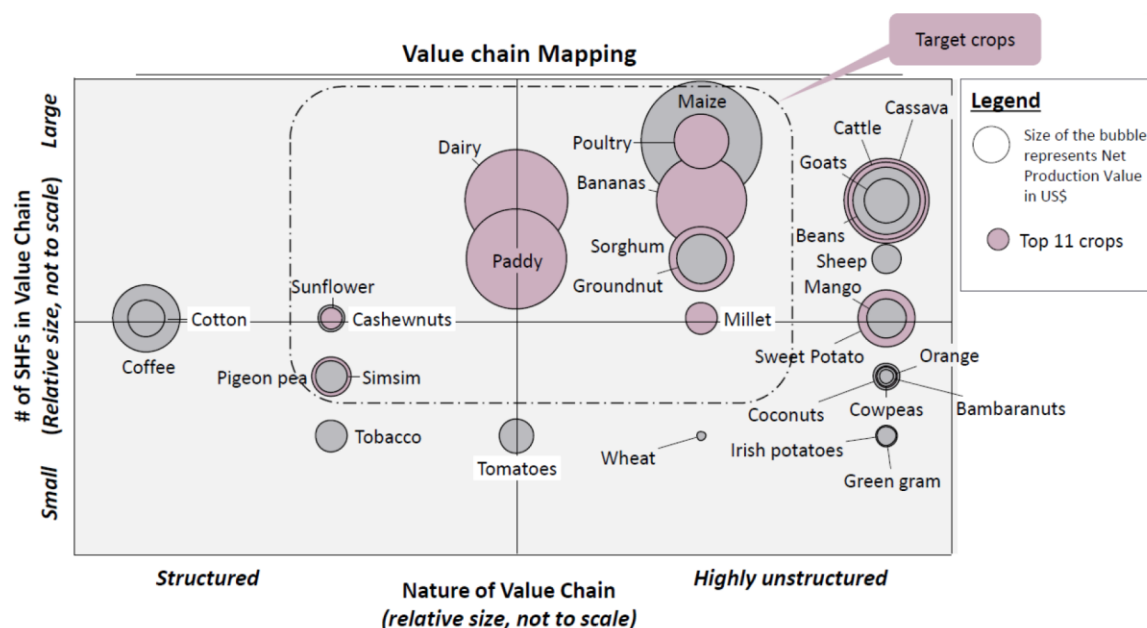
Value Chain Mapping

AFA has been designed as a deep, collaborative model working with private sector to rapidly iterate and test new products and delivery channels for smallholder farmers, bundling services where possible to drive uptake, lower costs of delivery and increase utility for SHF. In order to reach our program goal of one million SHF actively using digital financial services, we included a value chain mapping exercise to understand where significant numbers of underserved SHF are engaged to understand these activities and target program activities accordingly.

Up to date agriculture data can be difficult to access across value chains. Specific and actionable demographic data on youth and women is particularly difficult to access. The review described in this White Paper utilized the best information available, but it is important to note that there is an ongoing need for fresh data to inform product and service design and delivery. For the purposes of this study, we identified 30 value chains with the highest smallholder participation. Initial high level value chain analysis was followed by a deep dive analysis of four targeted VCs and was conducted through a combination of secondary research and in-person interviews with SHFs and value chain actors.

⁵² Ibid.

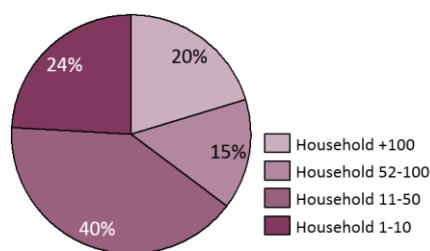
Figure 16: Smallholder Farmer Value Chain Mapping



Through our review, we found that while cereals and root tubers are major food crops for subsistence and commercial purposes, production levels vary extensively every year leading to high levels of income volatility. Cereals are planted on 61% of Tanzania’s total planted areas, while roots and tubers are planned on 14%. Similar to food crops, annual product of export crops also vary due to inconsistent access to inputs and weather patterns in Tanzania. The use of hand tools and reliance upon traditional rain-fed cropping methods and animal husbandry also hamper productivity. The average food crop productivity in Tanzania is 1.7 tons per hectare, whereas good management and optimal fertilizer use should result in yields of 3.5-4.0 tons per hectare. According to the Bank of Tanzania (BoT), only 15% of farmers use fertilizer.⁵³

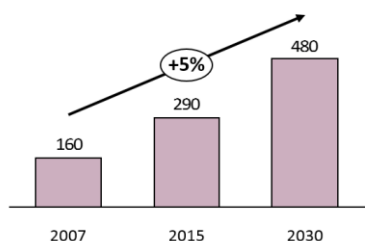
Figure 17: Key Statistics for Livestock Industry

Breakdown of cattle ownership



Majority of households rear 52-100 cattle, benefiting from economies of scale

Tanzania’s local demand for beef



The livestock sector, however, is on a positive growth trajectory and success in this industry is more likely to increase incomes for over 60% of rural households.⁵⁴ Smallholder farmers make up 97% of livestock production and 60% of rural households earn an average of 22% of their income from livestock rearing. Livestock farming is largely made up of cattle (18.8 million) and pigs (1.6 million). Beef product contributes 40% to the livestock sector, milk 30% and another 30% from small stock production. Increased population size, urbanization and income levels across Africa have boosted Tanzania’s demand for meat, which is expected to triple by 2030. The sector has attracted significant investment, including building technical skills to run ranches, feedlots, abattoirs and meat processors but more work is required to reach productive levels both in beef and dairy.

Based on the following key criteria, we identified the four most promising focal value chains for AFA to understand and support in depth over the life of the program, although activities are allowed in other VCs. Key criteria for included:

- ✓ Number of SHF, estimating populations living on less than \$2.50 per day
- ✓ Role of women and youth in the value chain

⁵³ Bank of Tanzania Annual Report 2013/14

⁵⁴ Livestock and Livelihoods in Rural Tanzania, Tanzania Investment Opportunity: Livestock

- ✓ Level of aggregation in the value chain across buyers and farmer access points
- ✓ Contribution to food security and nutrition
- ✓ Growth trends that would be indicative of the income potential of the VC.

Additional screening was completed after shortlisting to assess for major risk factors including lack of mobile coverage or penetration of digital infrastructure and political dynamics that could inhibit meaningful implementation. Following this review, AFA has selected a diversified portfolio of poultry, bananas, dairy and sunflower for our value chain priorities. These crops collectively reach 6.9 million farming households – with some crossover - and cover all ecological zones of the country, with high levels of female participation.

Table 2: AFA Focal Crop Selection

AFA portfolio: poultry, bananas, dairy cattle, and pigeon peas	
Large value chains	<ul style="list-style-type: none"> • Poultry**: ~3.8 million smallholder households account for 98% of production; and poultry is mainly reared by women and youth. • Banana: ~1 million households grow bananas. Typically a woman’s crop, it’s the main carbohydrate source for 30% of Tanzanians.
Semi-structured value chains	<ul style="list-style-type: none"> • Dairy**: 1.6 million households are engaged in dairy. The market is somewhat structured, with milk collection centers in place and milk processors off-taking milk and offering extension. • Sunflower: ~500,000 households are engaged. Sunflower is a moderately structured crop with higher opportunities for digitization.

Poultry involves nearly 3.8 million smallholder households accounting for nearly 98% of production, mainly reared by women and youth. Approximately one million households grow bananas, which is typically a women’s crop and important as a main source of carbohydrates for 30% of Tanzanians. Dairy involves nearly 1.6 million households and is relatively structured, with milk collection centers in place and milk processors off-taking milk and offering extension, although productivity levels are far below optimal. Sunflower represents nearly 500,000 smallholder households and is another moderately structured crop with higher opportunities for income and digitization.

In additional to the individual value chains, we also identified other opportunities, such as working with clusters of value chains with similar characteristics. There is also potential for growth working with COOPs and farmer groups to help them digitize operations to allow members to track contributions and investments mitigating loss of funds associated with informal groups. This can help build credit history for members, which can drive access to services from formal financial service providers (FSP). Traceability tools have important potential across value chains, especially for export to the European Union, as brokers do not have adequate tools to facilitate collection and ensure quality standards to meet the demand of many exporters.

There is very important work to be done in unstructured value chains where farmers most acutely lack access to service, including finance. While disaggregated farmers are hardest to engage, digital tools provide a unique means for communication in the absence of aggregators. Alternative data providers can increasingly provide links to these less accessible types of farmers, such as basic cell phone records, utility payments and emerging interaction on digital learning platforms via radio, television and SMS, through players like Sibesonke, Arifu, the Shamba Shape Up program and eSoko (see later sections for more detailed information).

There is also an important trend toward commercialization of farming, including an increasing shift from food crops to cash crops by small scale farmers working on increasingly smaller plots and looking for better returns, and into sectors with more transparent markets. In terms of farming methods, mechanization rates in agriculture are very low (10-15%), partly due to the nature of small scale

holding.⁵⁵ However, commercialization of small scale farming will increase demand for financing to meet the high capex costs for necessary equipment. Similarly, fertilizer use also lags behind OECD countries.

Farmers seeking to increase farm productivity need financing for new production methods such as irrigation, post-harvest storage and also need to address the rampant issues of fake seed and other inputs in the market. Increased incomes and urbanization have led to increasing demand for meat and dairy products, which directly translates to higher demand for crops like maize which are an important ingredient for feedstock. Within this context, weather unpredictability and poor soil quality have also affected the productivity of levels of farmers, expanding the scope of intervention needed to help farmers achieve long term success in agricultural markets.

Smallholder Aggregation

The primary channels of farmer aggregation in Tanzania are agricultural cooperatives (Co-ops), producer groups and farmer self-help groups. In less structured value chains, Co-ops are non-existent or play a much smaller role, with produce traded informally through agents or at markets; farmers in these value chains are typically in multi-produce societies. Cash crop value chains typically have Agricultural Marketing Cooperative (AMCOs) which often act as bulking/collection points for produce, may provide access to financing (but not deposits) and markets, and provide some extension services.

As of 2012, an estimated 3,000 cooperative societies and unions were directly involved in agriculture; non-agricultural societies made up approximately 70% of all Co-ops (total +/-10,000). There are also approximately 5,600 Savings and Credit Cooperative Societies (SACCOs).⁵⁶ SACCOs and co-ops offer a range of services, including farmer trainings, input financing, contract farming, market access, warehouse receipting, and/or crop storage. Cash crops (e.g., coffee, cashew nuts, tobacco, sugar cane, rice) and dairy have the highest number of value chain specific Co-ops. In terms of financial services, only SACCOs which are categorized as Micro Finance Institution (MFIs) and regulated by BOT are legally have ability to collect savings.

The East Africa Dairy Development program (EADD)⁵⁷ is an important support structure for dairy farmers in Co-ops, helping them build sustainable business hubs targeting 200,000 SHF in Tanzania, Kenya and Uganda. Dutch development agency SNV also supports aggregation for farmers in cereals, pulses, sunflower and dairy and links the subsequent farmer groups to markets. Private sector off-takers are also active in different value chains facilitating aggregation activities including, Litenga Holdings (cereals), ASAS Dairies (dairy) and Sugar Processors. The government's COWABAMA initiative under the Big Results Now initiative⁵⁸ (2013-16) is aimed at rehabilitating and building new warehouses, aggregating farmers around the warehouses and linking them to markets. Under the targeted maize and rice value chains, the government of Tanzania (GoT) plans to reach 700,000 SHFs. MAFC also facilitates aggregation through over 3,000 AMCOs in Tanzania.

Nevertheless, aggregation remains a significant challenge. In the recent CGAP national farmer survey, small holder farmers across the country reported they mostly sell their crops or livestock to retailers in villages or local markets, rather than through organized aggregators. Farmers are also more likely to sell to traders than to co-operatives. Moreover, 74% of farmers reported they are not members of any agriculture-related groups. Only 10% said they are members of a planting, weeding or harvesting group, 5% in a women's group or association, 2% in informal savings and credit group, 1% cooperative or producers' group and 1% in a SACCO.⁵⁹

⁵⁵ "Moving to Mechanization: Kenya, Tanzania and Ethiopia", CIMMYT 2015.

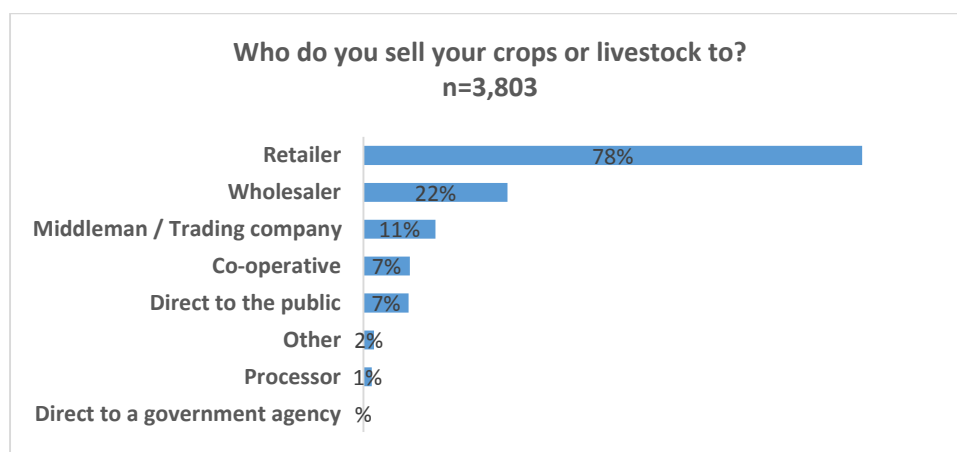
⁵⁶ AFA Tanzania Ecosystem Study, Dalberg 2016.

⁵⁷ <http://eagc.org/>

⁵⁸ <http://www.pdb.go.tz/documents/Achievement/Agriculture.pdf>

⁵⁹ Smallholder Financial Diaries, CGAP, 2016.

Figure 18: Sales Channels for Smallholders



Smallholder Profiles and Needs

In the first phase of the study, we developed a digest of leading farmer-centric research to understand what is already known about SHF’s financial and non-financial needs. We reviewed 15 recent studies with a range of focal areas, including SHF demographics, financial inclusion, etc. Agriculture, either directly or indirectly, employs 80% of Tanzanians and smallholders dominate Tanzania’s agricultural sector. According to a 2012 census, over 6.1 million households are involved in some form of crop or livestock-based agriculture.⁶⁰ 85% of all SHF households live below the poverty line of \$2.50 per day and 55% are extremely poor, living on under \$1.25 per day.⁶¹

As in most sub-Saharan African countries, SHFs in Tanzania have limited access to extension services, financial services, inputs and equipment and markets to sell their outputs. The typical SHF plot size in Tanzania varies from 0.9 hectares to 4 hectares. The majority of SHFs make use of rain-fed farming. It is estimated, for example, that 94% of smallholder rice farmers grow rain-fed rice, which is highly sensitive to weather and pests. Average yields for Tanzanian SHF are typically one-quarter to one-third of expected potential for smallholders in East Africa. Different studies estimate the number of extension workers per farmer to range between 1:630 and 1:2,307.⁶²

Approximately 18% of SHF are strictly subsistence farmers, with all others converting at least some farm production to cash or trading purposes.⁶³ The National Survey and Segmentation of Smallholder Households in Tanzania, completed in 2016 by CGAP and the Financial Services Deepening Trust of Tanzania (FSDT), developed an important segmentation framework for the countries’ 6.1 million SHF families identifying five core clusters of farmer households, utilizing a Random Forest algorithm to develop classifications.⁶⁴

⁶⁰ National Survey and Segmentation of Smallholder Households in Tanzania. CGAP 2016.

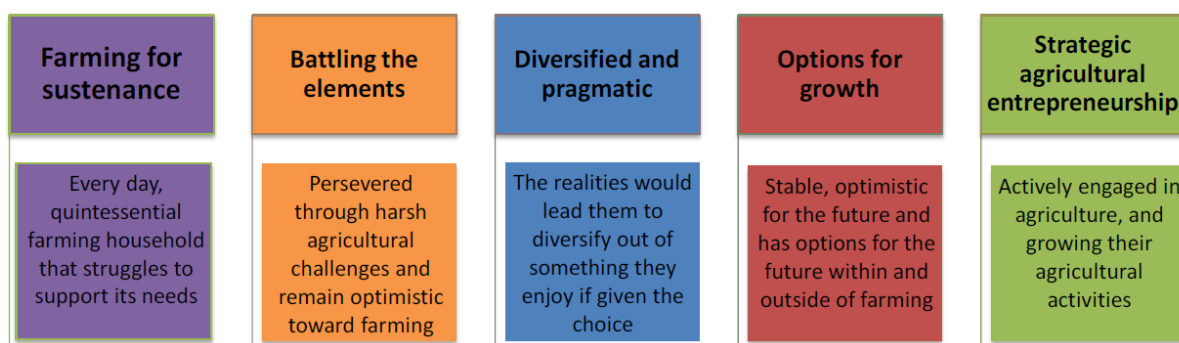
⁶¹ Ibid.

⁶² <http://africasoilhealth.cabi.org/reports/ashc-phase-2/tanzania>

⁶³ National Survey and Segmentation of Smallholder Households in Tanzania. CGAP 2016.

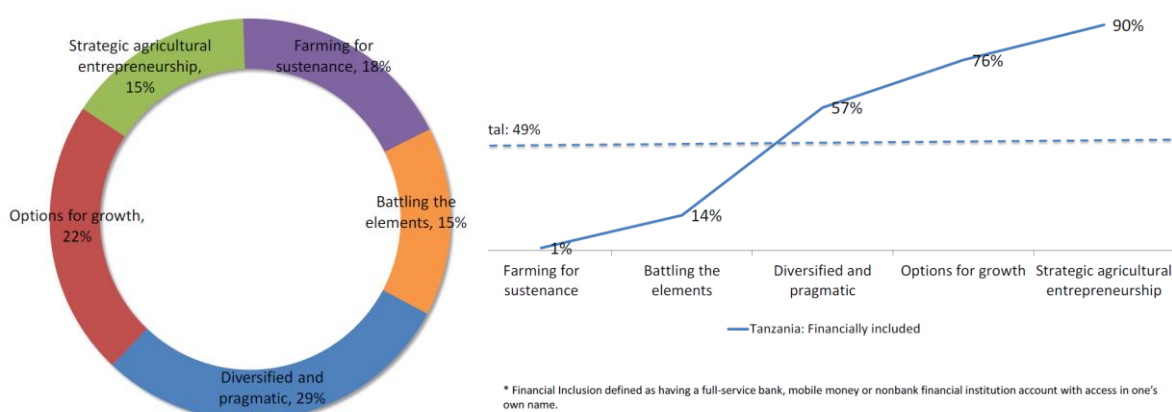
⁶⁴ National Survey and Segmentation of Smallholder Households in Tanzania. CGAP 2016.

Figure 19: Tanzanian Farmer Household Segmentation (CGAP)



These clusters describe relatively equal sizes of SHF segments, but with more than half of farmers in the middle groups which of “diversified and pragmatic” and “options for growth”, indicating important potential for reaching farmers with relevant products and services. The following tables demonstrate the breakdown of these different segmentations and the related access to financial services.

Figure 20: Tanzanian Farmer Segmentation and Related Financial Inclusion



CGAP’s segmentation approach tracks a number of important variables which help us better understand important aspects for each of these groups, key to designing products to meet their needs. While Tanzania is becoming increasingly more financially included, financial inclusion rates across farmer clusters are radically different. In this typology, there is a linear progression where the “farming for sustenance” (18% of farmers) is the most impoverished and “options for growth” shows the most advanced models of progress within the population. Mobile phone ownership, which is identified by 95% of all SHF as an important tool for farm management, is also illustrated on a clear trajectory as farm families’ progress out of poverty.⁶⁵

⁶⁵ National Survey and Segmentation of Smallholder Households in Tanzania. CGAP 2016.

Figure 21: Tanzania Smallholder Household Segments by Clustering Criteria

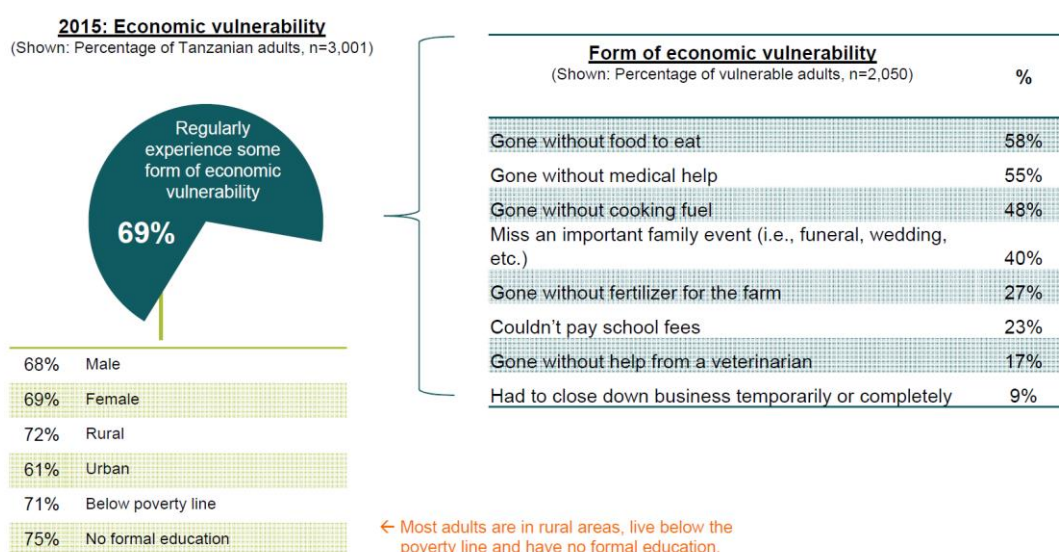
Segment=	Farming for sustenance	Battling the elements	Diversified and pragmatic	Options for growth	Strategic agricultural entrepreneurship
n= 2,795	557	393	826	628	391
Educational attainment of household head					
Never attended school	41%	25%	37%	6%	2%
Preprimary	1%	0%	1%	0%	0%
Primary	57%	69%	54%	85%	66%
Secondary	1%	5%	7%	8%	25%
Higher education	0%	1%	0%	1%	7%
Socioeconomic status					
Above the poverty line	4%	4%	13%	12%	43%
Below the poverty line	96%	96%	87%	88%	57%
Access to emergency funds: Can come up with 100,000 shillings within the next month					
Very possible	9%	16%	17%	21%	51%
Somewhat possible	17%	26%	31%	27%	49%
Not possible	73%	57%	52%	52%	0%
Don't know	0%	0%	0%	1%	0%
Mobile phone ownership – at least one phone in the household					
No	54%	38%	2%	0%	0%
Yes	46%	62%	98%	100%	100%
Attitude: The future will take care of itself					
Agree	38%	41%	32%	27%	28%
Disagree	61%	59%	67%	72%	72%
Don't know	1%	0%	1%	1%	0%
In the past 12 months, experienced any unexpected events (including, but not limited to death, illness, accidents, etc.).					
No, I didn't	9%	5%	7%	10%	7%
Yes, I did	91%	95%	93%	90%	93%

Poverty is a very significant issue in Tanzania, particularly for rural families, as illustrated in the graphs below from the InterMedia Tanzania study in 2015, showing that 72% of rural adults experience economic vulnerability, led by lack of food, medical care, cooking fuel and the ability to invest in their farm's production.⁶⁶ Based on the 2016 CGAP Farmer Diaries, 40% of SHF report they do not have enough money to buy food, and only 14% report they have enough money to buy food, clothes and save a bit of money but not enough to buy an expensive good.⁶⁷

⁶⁶ Ibid.

⁶⁷ National Survey and Segmentation of Smallholder Households in Tanzania. CGAP 2016.

Figure 22: Economic Vulnerability for Tanzanian adults



But even given this level of poverty, more than 80% of rural adults managed to save money in cash, most often in a safe place at home. With limited access to financial instruments, cash savings is a primary means of protecting farm families from economic shocks and during the hunger seasons before crops come in.⁶⁸ Friends and family are the leading source of credit for Tanzanians (63%), followed by loans from mobile money (17%).⁶⁹ Only 17% of adults have insurance, which is overwhelmingly medical. Agricultural insurance is, as of 2015, the least common of all insurance products.⁷⁰ Cell phone ownership has increased dramatically across the country, but only 70% of women have access to their own phone, and 72% of the overall rural population. Cell phone ownership has a direct correlation to financial inclusion, as illustrated below.⁷¹

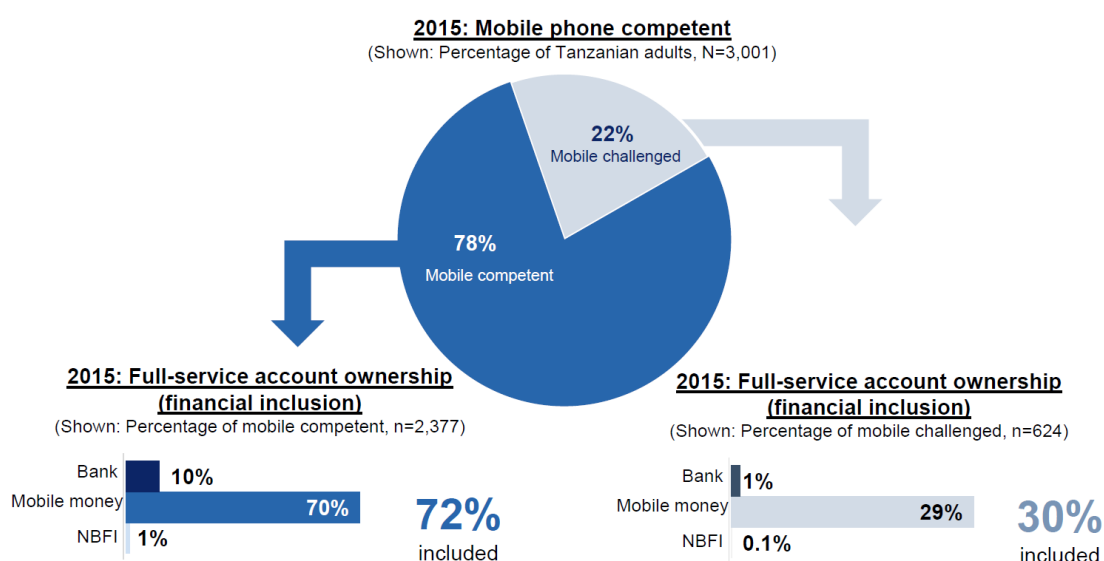
⁶⁸ Smallholder Diaries: Building the Evidence Base with Farming Families in Mozambique, Tanzania and Pakistan. CGAP, Anderson and Ahmed, 2016.

⁶⁹ Financial Inclusion Insights. InterMedia, 2015.

⁷⁰ Ibid.

⁷¹ Ibid.

Figure 23: Mobile Phone Competency Linked to Financial Inclusion



CGAP's Smallholder Diaries, completed in Tanzania in 2014 and 2015, provide additional important insights into the needs and behaviors of smallholder families. The Diaries find that SHF households typically have 11 different sources of income with a mix of farm and non-farm sources, which should all be considered when evaluating risks for financial services. Farming provides less cash (26% of total cash) but important in-kind income through consumption (46% of total cash and in-kind).⁷² The Diaries also found that smallholder households in the Tanzania sample were "net sellers" in loose value chains, or that they sold more of their agricultural output than they produced. While income is irregular, households also stored crops, consuming some proportion over time, but also monetizing it when needed.

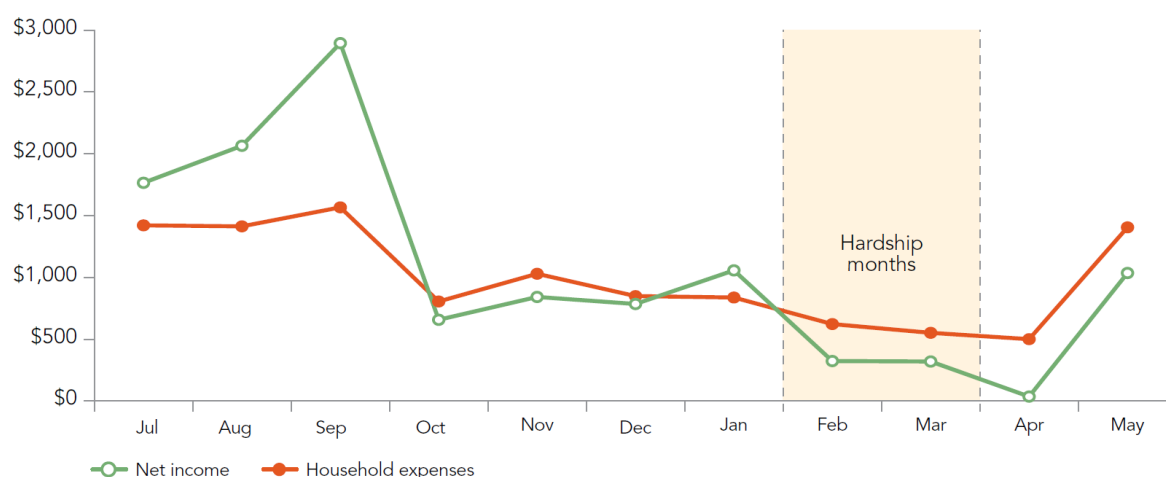
Agricultural production income is more volatile than other sources of income across the Smallholder Diaries sample, leading to increased farmer vulnerability. The use of digital financial services to help farmers increase investments and smooth income leveraging very small sums during planting and hardship seasons.⁷³ The Diaries also note that improved agronomic practice and better agricultural risk management are important for these types of farmers and off-takers interested in including them in their supply chain should bundle agronomic support with financial tools.⁷⁴ Likewise, given the significant impact of health-related shocks on farm families, interventions that include health benefits can ensure that they remain productive.

⁷² Smallholder Diaries: Building the Evidence Base with Farming Families in Mozambique, Tanzania and Pakistan. CGAP, Anderson and Ahmed, 2016.

⁷³ Ibid.

⁷⁴ Ibid.

Figure 24: Tanzania Smallholder Diaries, rice product village: Net income and household expenditures.



a. The green income line refers to net income. For agricultural production, and small businesses in particular, income refers to revenue less related expenditures. The red expenses line refers to operational expenses of the household separate from income or financial transactions (e.g., spending on groceries, clothes, education, transportation).

The study explored the nature of shocks which these households face, led by agricultural input price increases and crop price decreases, crops being destroyed by pests in storage or being destroyed by weather. Farm families typically did not have clear coping tools to address these risks, relying mainly on short-term savings, stored crops and livestock and access to informal sources of funds through friends, family and savings groups. While 74% of the farmers indicated a desire to use mobile money, only 19% of farmers actually used mobile money.

Recent studies conclude that while financial institutions and DFS providers remain important tools to explore and expand for SHF use, they must be carefully targeted to smallholder profiles.⁷⁵ Closer connections to buyers and aggregators in the value chain could also benefit Tanzanian smallholders, facilitating and digitizing purchase agreements or contracts, for example, against which farmers could borrow for inputs on mobile devices. Leading agricultural buyers in Tanzania, including the World Food Program, are exploring these types of arrangements for smallholders now. Safe storage methods to allow farmers to both ensure consumption and realize improved sales margins are additional important opportunities to help smallholders increase incomes.⁷⁶ CGAP's 2016 farmer study showed very high SHF willingness to save, trust in financial institutions and desire to invest and mitigate risk for their farms. Rapid increasing adoption of mobile money can provide a platform to help farmers reach these aspirations.

Women Smallholders

According to World Bank data, women form the majority of Tanzania's agriculture work force – particularly in rural areas, where 98 percent of economically-active women are involved in agriculture.⁷⁷ They prepare, plant, weed, harvest, transport, store, and process their farms' products. In addition to these time and labor-intensive activities, women are also the leaders in managing their household operations, including health, education and nutrition. This is an important and challenging role country

⁷⁵ Smallholder Diaries: Building the Evidence Base with Farming Families in Mozambique, Tanzania and Pakistan. CGAP, Anderson and Ahmed, 2016.

⁷⁶ World Food Program, Patient Procurement Platform: <https://www.growafrica.com>

⁷⁷ World Bank, <http://elibrary.worldbank.org/doi/abs/10.1596/978-0-8213-7262-3>

where 42% of children under 5 years old suffer from stunted growth, due to malnutrition, and 16% are underweight.⁷⁸

The differences between male and female smallholders in Tanzania and their use of financial services are moderate. Access to bank service either by owning an account or use of another's account is a 14% for men 11% for women, while access to a mobile money service among smallholders is at 58% for men and 55% for women. Access to NBFIs is at 8 percent for male and 10 percent for female smallholders. Small holders who hold bank accounts are at 11 for men and 8 percent for women, while those holding mobile money accounts are at 52% for men and 45% for women.⁷⁹

Likewise use of mobile phones does not strongly differ between male and female SHF, although there is meaningful room to increase women SHF digital inclusion. Farmers who have ever used a mobile phone comprise 85% for men, and 78% for women, while those most likely to purchase a mobile phone in the next 12 months are 38% for men and 29% for women.⁸⁰ Among smallholders in Tanzania who have an active, working SIM card registered in their name, 85% are men and 81 percent are women. Studies find that women who own mobile phones are very likely to become active mobile money users. As of 2015, 49% of women in Tanzania were active mobile money users.⁸¹ Indeed, the 2015 Financial Insights study indicates that DFS for women is the country's most important opportunity to promote financial inclusion and thereby address the high incidence of poverty.

The GSMA, the global association of mobile network operators (MNOs) has identified women as a critical target market for digitally-enabled service for smallholders, including information and advisory services, supply chain management, market linkages and mobile financial services.⁸² A recent study also notes the important trend of male urban labor migration leaving women to farm. The study notes significantly lower uptake of mobile services by women, mainly linked to cost, culture, illiteracy and perceptions of value, compared with other financial outlays such as health and nutrition. Technology is often considered the male domain in rural communities. And while mobile phone penetration is high in Africa at almost 80%, according to the GSMA women in sub-Saharan Africa are on average 23% less likely to own a mobile phone.⁸³ Such cultural and behavioral issues must be addressed if women SHF are to benefit from advances in DFS in Tanzania, which is a core focus on the AFA Farmer Capability Lab. The following table sets out key challenges faced by women farmers in Tanzania, linked to specific types of financial products, infrastructure barriers and the enabling, environment.

⁷⁸ USAID blog: blog.usaid.gov/2014/03/want-to-empower-women-in-agriculture-use-technology/

⁷⁹ CGAP, National Survey and Segmentation of Smallholder Households in Tanzania: Understanding Their Demand for Financial, Agricultural and Digital Solutions, May 2016.

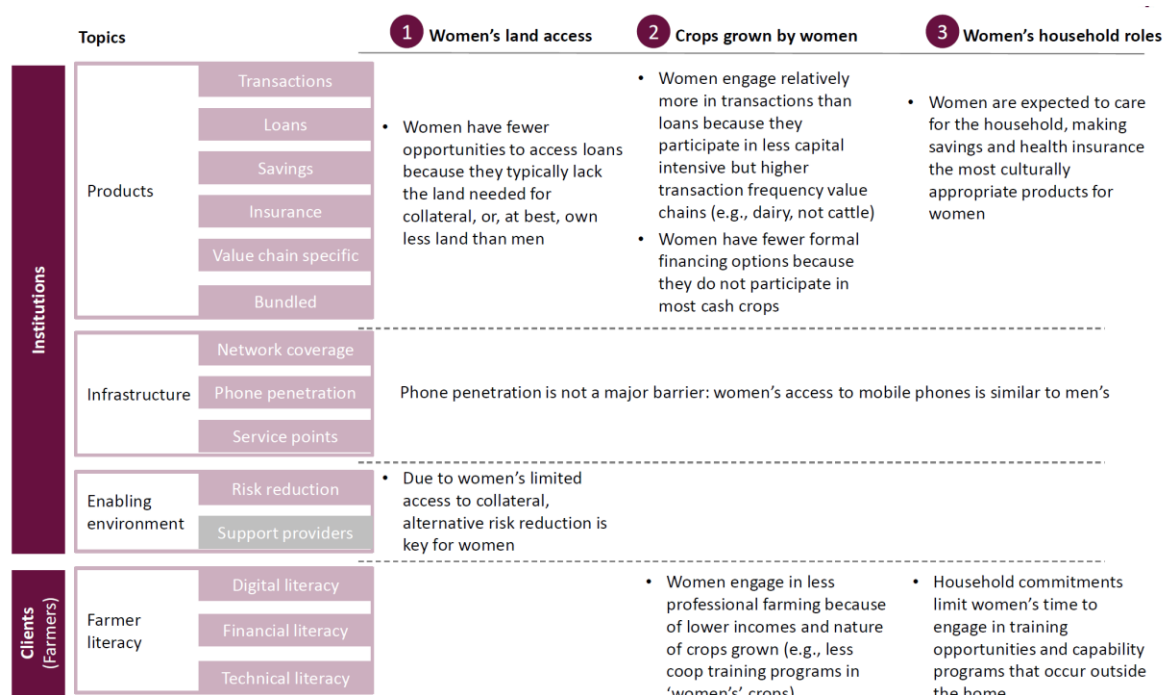
⁸⁰ Ibid.

⁸¹ Ibid.

⁸² GSMA, "Women in Agriculture: A Toolkit for Mobile Services Practitioners", May 2014.

⁸³ Ibid.

Figure 25: Barriers for Tanzanian Women SHF



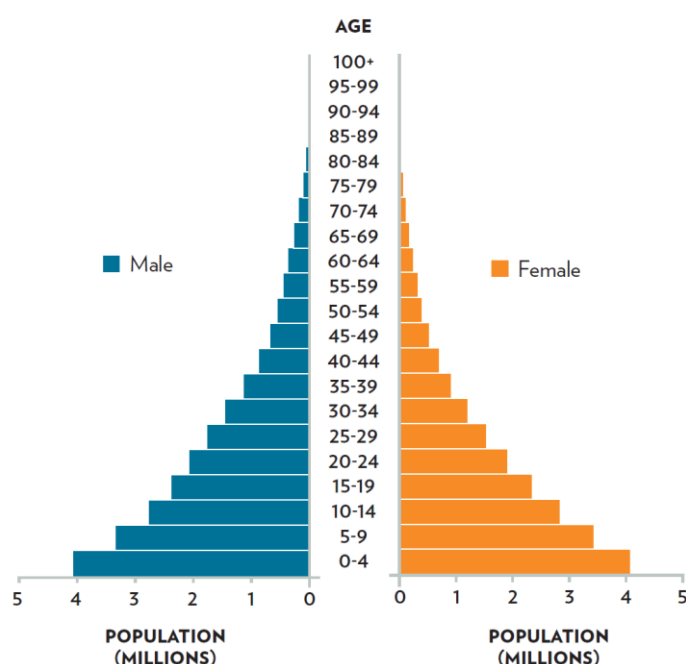
Youth Smallholders

Like other East African countries, Tanzania has a disproportionately young population, where nearly 60% of the population is below the age of 25. The gross secondary education enrolment is slightly above the East African average, but still below half of the global average. Less than 8% of the Tanzanian population age 25 and above have attended some secondary school, which is less than 15% of the global average.⁸⁴ With 800,000 young Tanzanians entering the workforce every year, jobs are hard to find with official unemployment around 14%, with higher rates in urban areas and around 7.1% in rural areas.⁸⁵

⁸⁴ UN Human Development Report, 2014.

⁸⁵ <https://www.theguardian.com/global-development-professionals-network/2014/jul/11/africa-youth-unemployment-population-growth>

Figure 26: Population by Gender and Age



Source: UN ESA, World Population Prospects

The Tanzanian government has recognized that a lack of technological advancement, resources and incentives for improving the agriculture sector have led to the majority of youth turning away from farming activities. The Ministry of Food Security and Cooperatives is targeting higher investment in technology and skills development to stimulate the interest of graduates toward agriculture.⁸⁶ Among farming families, only 6% desire that their children remain in agriculture, mainly because of perceptions of limited ability to earn income.⁸⁷ Major challenges are around the continued use of traditional farming methods and lack of access to finance, land and markets, but transitions to urban environments often lead to even higher levels of unemployment and poverty for young adults. The following table presents key constraints faced by young farmers in Tanzania.

Table 3: Key Constraints Facing Youth SHF

⁸⁶ <http://www.tccia.com/tccia/?custom2=why-tanzania-youth-shun-farming>

⁸⁷ Financial Inclusion Insights. InterMedia, 2015.

Constraint	Description
Education and vocational training	<ul style="list-style-type: none"> • Traditional teaching methods do not provide adequate opportunities to learn practical agricultural skills at school or through vocational education • Young people are not encouraged to look for employment opportunities in rural areas, often seeking jobs that are more prevalent in urban areas
Access to land	<ul style="list-style-type: none"> • Stigma attached to young people inheriting land before elder relative has died and few opportunities for young women to inherit land at all • Farmers therefore are constrained to either farming on small portions of land or rented land and therefore struggle to commercialize production
Perception of agriculture	<ul style="list-style-type: none"> • Many young rural people grow up watching their parents working their plots of land with manual tools, and may even have contributed as child laborers • This taints their perception of agriculture, and inhibits their ability to understand the real potential that the agro sector possesses in terms of employment opportunities
Access to finance	<ul style="list-style-type: none"> • There are three major barriers that youth encounter when trying to access and use formal financial services: <ul style="list-style-type: none"> i) Restrictions in the legal and regulatory environment (e.g., minimum age and identification requirements) ii) Inappropriate and inaccessible financial products offered by financial service providers iii) Poor financial capabilities of youth
Access to markets	<ul style="list-style-type: none"> • Rural youth frequently lack the required knowledge of how markets work, as well as information on prices. • Young rural women face additional difficulties in accessing markets, as their freedom of movement may be restricted in many communities because of social and cultural norms
Climate change factor	<ul style="list-style-type: none"> • Agricultural production and related activities have already suffered from high volatility due to climate change particularly changing rainfall patterns, particularly changes in the onset of rains and rainfall distribution, resulting in frequent dry spells in some areas and torrential rains in others. • Some young farmers doubt whether a career in Agriculture could constitute a viable economic opportunity

Youth in Tanzania are more likely to have a cell phone (and a smart phone) than individuals over the age of 35, but this is also highly correlated with higher educations, income and understanding of English, which much less prevalent among rural youth.⁸⁸ Future research is needed to better understand the use of mobile technology by youth in Tanzania. The 2015 Financial Inclusion Insights study does show, however, that youth were just as likely as adults over 35 to be active users of mobile money (at 63%). This demonstrates an important opportunity for DFS to reach out to and serve youth, although usage rates are lower for the rural poor, which must be taken into consideration in design of agricultural and youth-specific products.

Not all constraints listed above can be overcome utilizing technology. Some barriers such as i) education and vocational training; ii) perceptions of agriculture; iii) access to finance; and iv) access to markets can be addressed leveraging digital tools. "Farming as a business" approaches are gaining traction by helping SHF make the shift from subsistence farming to farming for profit, promoted through key media players, such as Shamba Shape Up.⁸⁹ These approaches empower farmers to plan, produce, market, and use records, working in groups that can efficiently promote information dissemination, bulk buying, and collective marketing. These types of initiatives have strong potential to leverage technology and bring SHF, particularly tech-enabled youth, into a more productive level of farming.

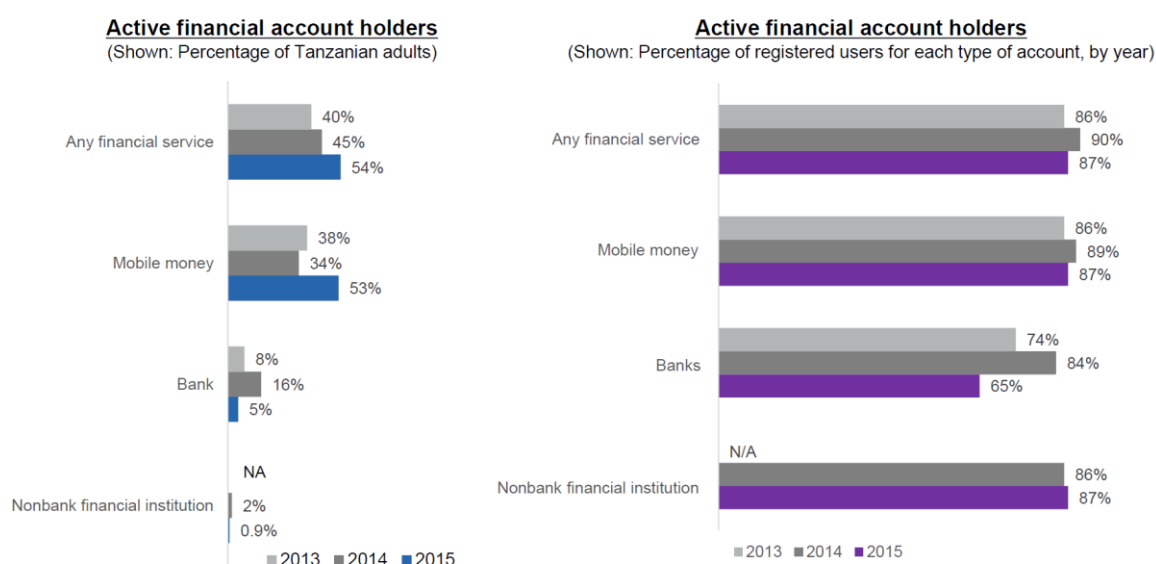
⁸⁸ Pew-Research-Center-Africa-Cell-Phone-Report-FINAL-April-15-2015.pdf

⁸⁹ <http://www.shambashapeup.com/>

Financial Inclusion

Financial inclusion has made remarkable strides over the past seven years. In 2009, more than half of Tanzanian were excluded from both formal and informal financial services. By 2015, nearly two-thirds of adults were registered users of financial accounts.⁹⁰ This progress was to a very great extent driven by the rapid expansion of digital financial services (DFS), following its initial introduction in 2008 by Vodacom through mobile money, which is a service to utilize a mobile phone to access financial services (GSMA). Mobile money is quickly becoming the main, almost sole, pillar of financial inclusion, with useage far surpassing that of banks and non-bank financial institutions (NBFIs).

Figure 27: Levels of Financial Account Holders and Active Users (2015)⁹¹



Types of accounts are not mutually exclusive.

Source: InterMedia Tanzania FII Tracker surveys Wave 1 (N=2,997, 15+), November 2013-March 2014; Wave 2 (N=3,000 15+), August-October 2014; Wave 3 (N=3,001, 15+), September-October 2015.

Advances over the past five years are attributable almost entirely to mobile money, with 61% of adults registered for accounts, while 8% of the adult population hold bank accounts and only 1% other nonbank financial institution accounts.⁹² Use of banks and NBFIs declined slightly from 2014 to 2015, with the most significant decreases in rural areas, which are turning increasingly to mobile money.⁹³

Impressive strides have been made over the past two years alone in terms of account ownership for traditionally marginalized groups including women, the poor and rural populations. Important advances have also been made in the the deepening of financial inclusion, with with three quarters of active account holders using advanced mobile money functions, including bill pay and savings, although access to loans and insurance remains extremely low.⁹⁴ Most of mobile money use is now through a registered account. Unregistered use of financial services, or over-the-counter (OTC) transactions, having reduced significantly.

⁹⁰ Financial Inclusion Insights, InterMedia 2015

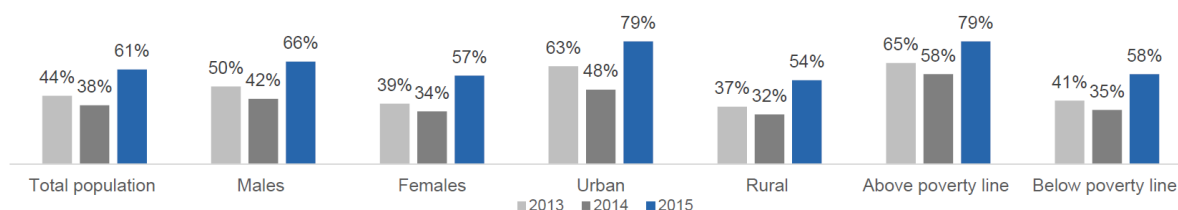
⁹¹ Ibid.

⁹² Ibid.

⁹³ Ibid.

⁹⁴ InterMedia 2015.

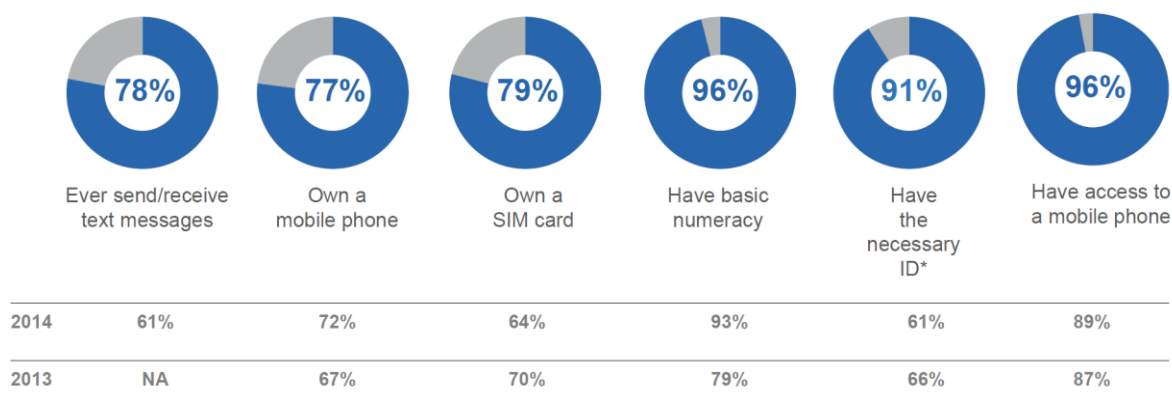
Figure 28: Demographic trends for all registered mobile money account users



Rural populations have shown particularly high increases in access and use of financial services, mainly mobile money. Now, nearly all Tanzanians know of at least one mobile money provider, and for every five people who know of mobile money, three use it.⁹⁵ Still, the benefits of the past decade of growth have not been distributed equitably. Inequality has increased between urban and rural population and approximately 12 million Tanzanians are still living in poverty.⁹⁶ In terms of agriculture, nearly 50% of agribusinesses and smallholder farmers do not use any form of financial product or service.⁹⁷ Rural women, who make up more than 70% of the agricultural workforce, are still at a significant disadvantage, particularly in terms of active use of accounts.

Women constitute an important opportunity for DFS in Tanzania. Studies do find that women who own mobile phones are very likely to become active mobile money users. As of 2015, 49% of women in Tanzania were active mobile money users.⁹⁸ And while women have also traditionally had lower access to mobile phone, 2015 data shows very important advances in access to mobile phones and the necessary identification to register an account, which should lay the groundwork for continued increases.⁹⁹

Figure 29: Key Indicators of preparedness for digital financial services



According to the CGAP 2016 smallholder farmer study, 77% of SHF report they have never been inside a bank.¹⁰⁰ **Only 10 percent of smallholders have a bank account registered in their own name.** Of those who do have an account 50% indicated they had used it for any financial activity within the

⁹⁵ InterMedia 2015.

⁹⁶ World Bank, 2015.

⁹⁷ Financial Inclusion Insights, InterMedia 2015

⁹⁸ Ibid.

⁹⁹ Ibid.

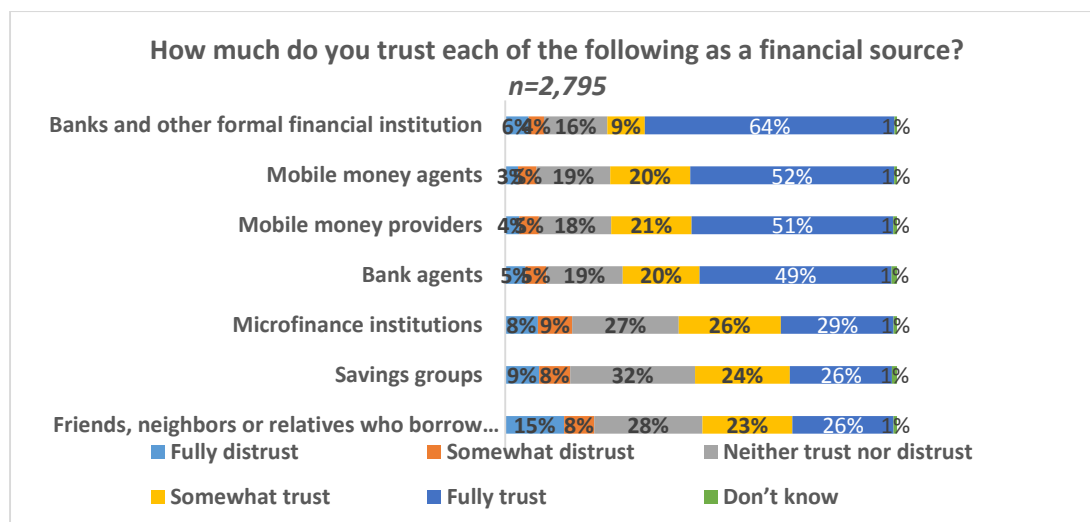
¹⁰⁰ CGAP, National Survey and Segmentation of Smallholder Households in Tanzania: Understanding Their Demand for Financial, Agricultural and Digital Solutions, May 2016.

past 30 days. But 70% of the SHF who have ever used a full-service bank do not use their bank account to make business transactions.

Small holder farmers have a high awareness of mobile money: 76% report they have heard of mobile money, and 97% are aware of the benefits of mobile money.¹⁰¹ Overall awareness of mobile money providers is high for Vodacom, Tigo and Airtel. Smallholder farmers are aware that they can commonly use mobile money for basic financial activities with cash in/ cash out at 90 percent, person-to-person money transfers at 66% and purchase of airtime at 42%. However, advanced use of mobile money to save or store money for the long term is at 32% and to make business transactions and bill payments are both at 19%.¹⁰²

Use of mobile phones for financial transactions among Tanzanian SHF is mostly on a monthly basis. More than 25% all SHFs, both urban and rural, have made financial transactions using mobile money in the past 30 days. Most of the smallholder farmers who are transacting monthly are rural men.¹⁰³ Nevertheless, roughly 50% of SHF exhibit a high trust in bank, bank agents, mobile money providers and mobile money agents, much higher than their trust in NBFIs and informal financial institutions. This high level of trust would suggest a possible foundation on which MNOs and banks may build to collaborate and provide useful digital products and services to include more smallholders in the national retail payment and financial system.

Figure 30: SHF Trust in Financial Service Providers



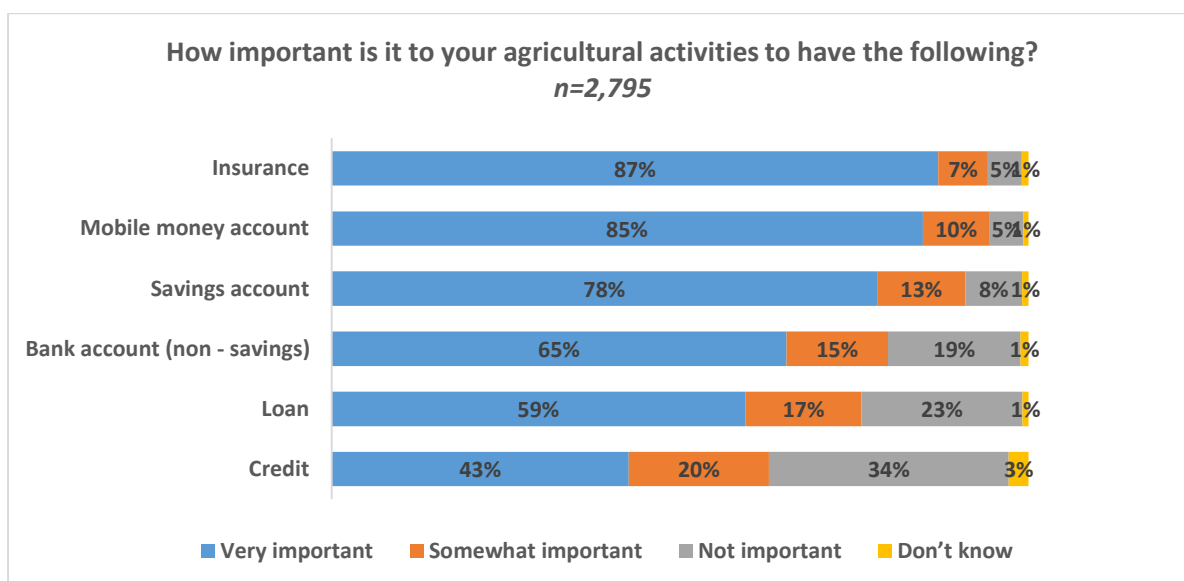
In the CGAP farmer study, similar to the aspirations of farmers to access digital information services, small holders know the importance of saving in financial institutions and investing in the farm. They also see financial accounts and even insurance, especially health insurance, as highly relevant. Short-term credit and tailored loans are also important.

¹⁰¹ Financial Inclusion Insights, InterMedia 2015.

¹⁰² CGAP, National Survey and Segmentation of Smallholder Households in Tanzania: Understanding Their Demand for Financial, Agricultural and Digital Solutions, May 2016.

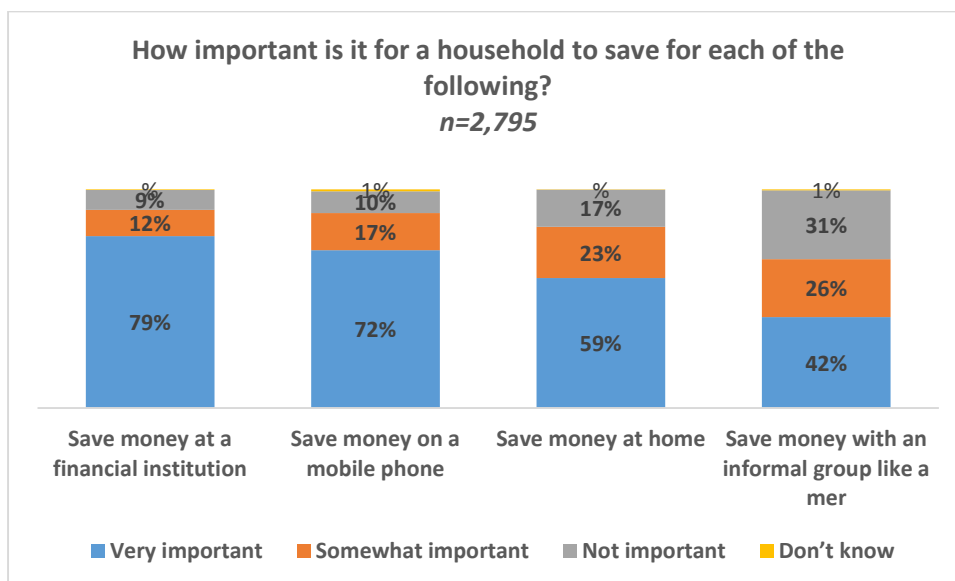
¹⁰³ Ibid.

Figure 31: Importance of Financial Services to SHF



The perceived importance of the financial instruments or tools also informs a diversified savings strategy that suggests formal financial service providers may compete well against informal mechanisms with an appropriate mix of services. Over 90% of Tanzanian small holder farmers consider the farm an important place to invest. Many SHF say the farm is the most important, followed by healthcare.¹⁰⁴

Figure 32: SHF perceived Importance of savings



As a part of this study, we have evaluated farmer’s unmet needs for a range of financial and non-financial services. In Tanzania, farmers use mobile money more than any other form of formal or semiformal financial service and increasingly for more complex financial services including savings and bill payments.¹⁰⁵ But farmer use of mobile money is typically limited to infrequent receipt of remittances. Use of more sophisticated DFS products, such as m-Pawa, was very low across focus groups, with only 2 of 66 farmers interviewed utilizing services. Use cases for mobile money beyond basic payments are only beginning to penetrate rural areas, where cash transactions predominate and the majority of savings is in-non monetary forms such as purchase livestock, pre-purchase of inputs, stored crops to

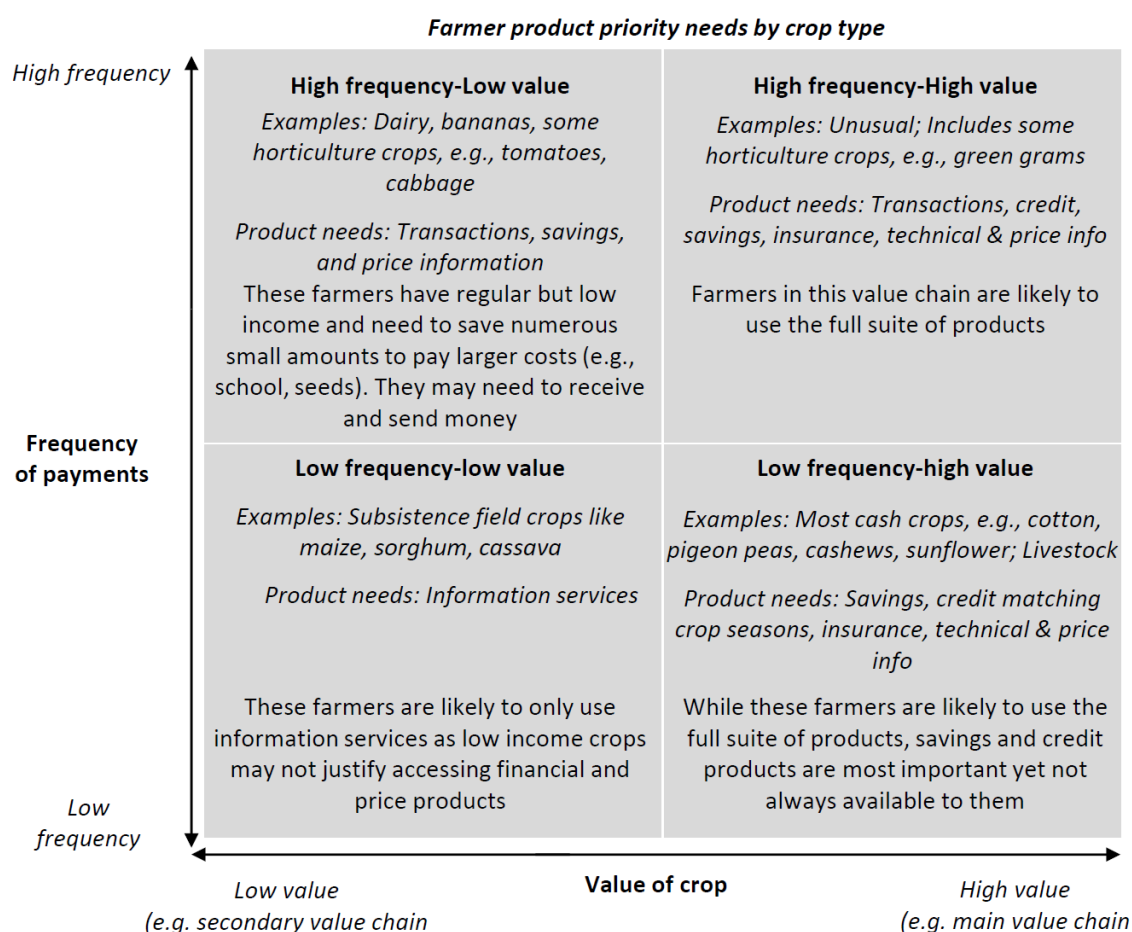
¹⁰⁴ Ibid.

¹⁰⁵ Dalberg farmer focus groups, November 2015.

sell later at higher price, crop banking, etc. Some farmers do save through mobile money specifically because it is difficult to cash out, leveraging the forced nature of savings. In-kind input loans also predominate and are preferred over cash-based loans, and often are not perceived as loans at all. Farmers tended to understand insurance, but prefer health insurance options to agricultural options, most likely due to familiarity.

The nature of value chains is also very important in considering smallholder needs. The following table presents a framework used by AFA to identify opportunities and develop relevant DFS and digital information services (DIS) services for farmers:

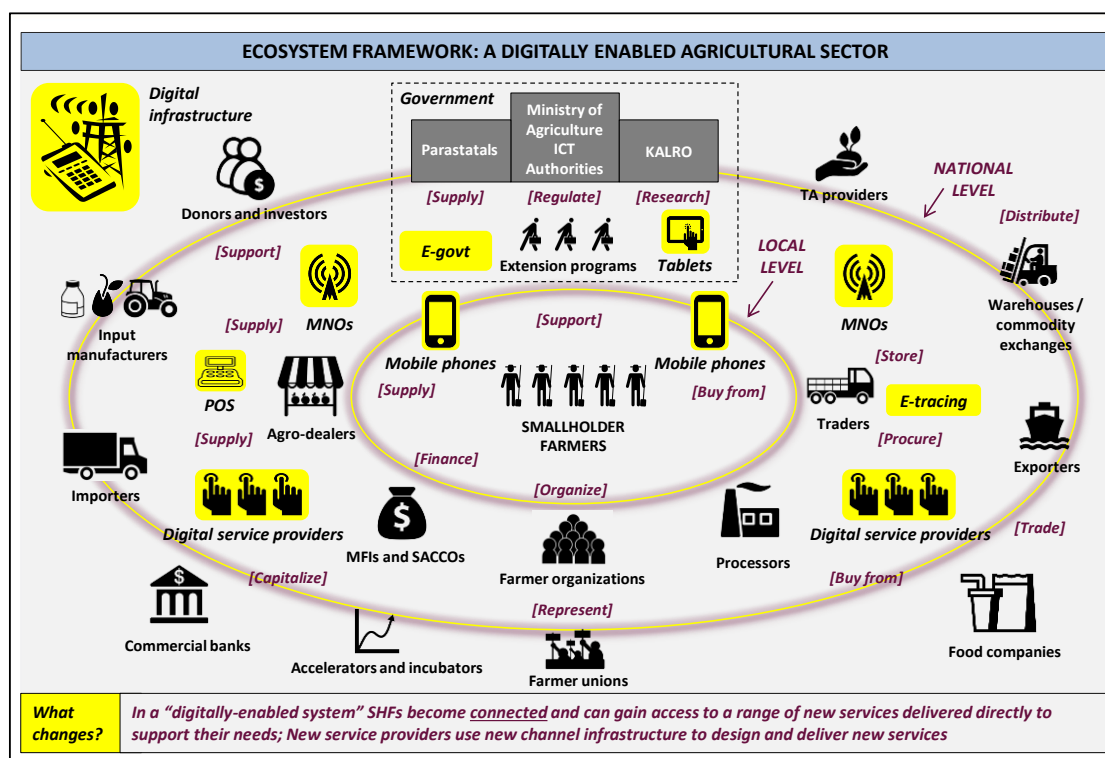
Figure 33 Farmer Product Priority Needs by Crop Type



Ecosystem Assessment

The study takes an ecosystem approach to understanding the market landscape and farmer needs, which includes, but is not limited to, value chain analysis. In order to drive DFS development, a value chain view is not sufficient alone. SHFs tend to be involved in multiple value chains. Focusing on an exclusive VC may miss the complexities of household strategies to manage risk and related needs for services. Ecosystem analysis allows AgriFin to contextualize impact, defining what a mature, well-functioning digital services ecosystem looks like to drive understanding of AFA’s comparative advantages to contribute.

Figure 34: Ecosystem Framework for a Digitally Enabled Agricultural Sector



High functioning ecosystems drive efficiency and increase active use of services. For SHFs, ecosystems of providers include buyers, suppliers, farmer unions, banks, insurers, MNOs, government and a diverse range of other players. These ecosystems are often fragmented and few actors are technology enabled. AgriFin Accelerate approaches ecosystem development through our partnership activities, bundling of services and through dissemination of evidence-based learning to ecosystem actors. We tackle the challenge of farmer inclusion following a Market Systems Development (MSD) approach that is focused on understanding why the agriculture market systems in Kenya, Tanzania and Zambia are not efficiently working for the poor, then addressing the underlying systemic constraints that are present.

The agriculture sector has a diverse set of stakeholders who contribute to policy-making, marketing, trading, financing, capacity building and research. Major government and parastatals bodies primarily are involved in policy and regulation, research, financing, quality assurance and supply of inputs. Many of these institutions, as well as major private sector players like Syngenta and Yara, are launching digital tools and portals to assist in sector growth. In addition to government players, there are multiple bilateral and multilateral donors supporting the agriculture sector in Tanzanian. The active collaboration of these actors will be required to move Tanzanian agriculture and smallholder finance to more efficient digital platforms in a meaningful way impacting both productivity and farmer income.

We kicked off our Tanzania operations by conducted an ecosystem assessment for digitally-enabled services to SHF in order to understand the nature and maturity of the ecosystem, as well as how the overall ecosystem promotes or inhibits the expansion of digital financial services and how AFA can best support its future growth. In order to understand the ecosystem of actors relevant for digital service delivery to SHF, the Dalberg and AFA team conducted 30 interviews with external stakeholders.

Enabling Environment

The formal financial sector in Tanzania is concentrated around a few large banks, but also includes many smaller players. The country has over 50 commercial banks—supposedly the largest number in East Africa—alongside rural and community banks, MFIs and SACCOs. They are, however, for the most part relatively small and branch density at 2.2 per 100,000 inhabitants is relatively low. Just three commercial banks—FBME, CRDB and NMB—have nearly 50% of the market share and the top ten hold a combined 80%, with over forty others sharing the remaining fifth. There are approximately 5m bank accounts in the country, across a population of nearly 55 million.¹⁰⁶

Figure 35: Financial Service Providers

	Description**	Examples	Services Offered	
Formal bank	Service providers that are regulated and supervised by independent statutory regulatory agencies	<ul style="list-style-type: none"> • Commercial banks: 45 commercial banks - FBME, CRDB, and NMB with 48% of the total industry assets • Deposit taking microfinance institutions: unknown numbers • Insurance providers: 26 insurance companies and 89 insurance brokers* • SACCOs: Approximately 5,500 	Credit	✓
			Insurance	✓
			Saving	✓
			Transactions	✓
Formal non-bank	Service providers that are subject to oversight by regulatory agencies or government departments/ministries. Non-bank service providers are authorized to conduct all financial transactions, except deposits of money	<ul style="list-style-type: none"> • Mobile phone service providers: 3 MNOs, Vodacom (53%), Airtel and Tigo sharing 84% of the market <i>Alternative payment services typically use MNO platforms</i> • Tanzania Postal Bank • National Social Security Fund (NSSF) • National Health Insurance Fund (NHIF) • Cooperatives: Over 6000 serving 700,000 individuals • Credit-only MFIs: unknown number - do not offer savings • Credit-only SACCOs: unknown number - do not offer savings • Non governmental organizations • Hire purchase companies 	Credit	✓
			Insurance	✓
			Saving	✓
			Transactions	✓
Informal	Financial services obtained through unregulated service providers	<ul style="list-style-type: none"> • Informal groups: VSLAs, VICOBAS, SACAs, and ROSCAs • Shopkeepers/Merchants: Agro dealers and other shop owners can offer shop credit • Agribusinesses i.e. input suppliers and ginners • Employers • Money lenders 	Credit	✓
			Insurance	✗
			Saving	✓
			Transactions	✗

*Regulatory requirements to be researched further **This categorization is preliminary and will be improved based on stakeholder interviews
Source: FSDT; Tanzania Banking Survey, 2012

The regulatory environment established by the Bank of Tanzania (BoT) in constructive partnership with the Tanzania Communications Regulatory Authority (TCRA) is seen by many as a best practice example for other countries regulating digital financial services. For the first five years, the BoT adopted a wait-and-see approach, choosing to regulate the space carefully to allow innovation by issuing letters of no objection and has only recently started to fix more detailed sets of regulations (see annexes for more information).

The DFS market in Tanzania has grown to match the Kenyan one, with a more diverse market structure. While the share of population actively using the services at 61% is still somewhat lower than Kenya's, the total value transacted has reportedly surpassed that of its northern neighbor. More importantly, the market is very competitive, with three evenly matched on voice share and the DFS market leader Vodacom aggressively followed by Tigo, Airtel and newcomer Halotel as well as various banks rolling out agents and several large aggregators with agents numbering in the tens of thousands. Notably, nearly three quarters of agents are not exclusive but serve multiple providers—which not only makes for a competitive environment but lays the foundation for agent level interoperability, which can expand both partnership options for ecosystem players and choice for farmers. Major MNOs active in the space include:

¹⁰⁶ FinScope 2013

- › Vodacom, with a 31% voice share (12.4M customers) and the first to launch MM already in 2008, is the leading player in MFS with a reported 42% of active MFS users, and particularly strong market share in many rural areas.
- › Tigo follows close behind with a 29% voice share (11.4M customers), but despite launching Airtel Money soon after Vodacom in 2009 has 31%customers) and 24% of active MFS users, with strong market share in the Dar and coastal regions
- › Airtel has a 27% voice share (10.7M customers) and launched Tigo Pesa in 2010, which despite the smaller voice base is beating Airtel to the #2 slot on MFS with 24% of active MFS users, with strong market share in the Dar and coastal regions.
- › Zantel, which was recently acquired by Tigo/Millicom, dominates both voice and MFS in Zanzibar to the tune of an 80% market share, but is a marginal force nationwide with only around 5% of voice customers and 3% of active MFS users.
- › New MNO entrant Halotel is currently making strong inroads in the voice market, especially in rural areas where it has a strong government mandate to operate, and is expected to launch its Halopesa mobile money product in the next month.¹⁰⁷

While commercial banks are slightly behind the MNOs in terms of developing DFS and relevant agent networks, several of them are engaging in this space to support rollout of their digital financial services. Leading banks include:

- › National Microfinance Bank (NMB) is the second largest bank by assets but boasts the largest branch network, with 165 branches and 500+ ATMs serving its 2.2 million retail customers and 100+ corporate clients; it also processes 30-40% of all government payments, both G2G and G2P, much of it by electronic fund transfer within the bank. It was created from the restructuring of the National Bank of Commerce (NBC) by Parliament due to its near monopoly of commercial banking in Tanzania. Today it offers a mobile banking service including bill pay, money transfer to anyone with a phone (cash out at ATM) and wallet-account transfers to and from M-PESA. NMB has however not yet deployed banking agents, preferring a cautious approach that sees it tie up with the right partners and aggregators rather than embark on a large acquisition program of its own.
- › Community Rural Development Bank (CRDB) is the third largest by assets and has 115 branches serving its 1.5m customers. CRDB sees agents as a key strategy for footprint expansion and as of mid-2014 has around 500 of them. CRDB is currently the only bank whose customers can deposit to and withdraw from their bank accounts at M-PESA agents (and vice versa: M-PESA customers can cash in and out at CRDB agents).
- › Equity Bank entered Tanzania only in 2012 and as of Aug 2014 have only 6 branches and 240 agents serving over 20,000 customers. They plan to build out to around 20-30 branches but will rely on agent and mobile channels for the remainder of their distribution.
- › Access Bank Tanzania is an up and coming bank which has made over 2,000 loans to individual farmers over the past year and is looking to expand this portfolio through digital channels. The bank has enjoyed an average annual growth rate of 48% and has assets of \$71.2 million and has upcoming plans to expand into DFS.¹⁰⁸
- › MFIs in the country include FINCA, MEDA, One Acre and PRIDE, as well as numerous smaller Tanzanian MFIs, such as Yetu.

¹⁰⁷ Tanzania Communications Regulatory Authority. March 2016 Quarterly Statistical Report








¹⁰⁸ MIXX Market, January 2016.

Financial Services for SHF

One of the most critical parts of this study is the financial service provider and product landscaping review, which included both formal and informal services. Investment in this sector is critical, as economic growth from agriculture is at least twice as effective in reducing poverty as growth in other sectors.¹⁰⁹ At an estimated \$450 billion, the global demand for smallholder agricultural finance is largely unmet. Impact-driven agricultural lenders are estimated to reach no more than two percent of demand.¹¹⁰

The opportunity for digital financial services (DFS) for smallholder farmers is very promising in Tanzania, given the significant advances in financial inclusion, largely attributable to the growth of mobile money, over the past five years. This portion of the study covers providers and relevant products on offer for SHF in Tanzania and identifies most promising product opportunity areas given SHF needs. There is a growing trend towards formal service providers offering services that are entirely or partially digital. Major commercial banks, insurance providers, and tailor-made social enterprises dominate the credit and insurance markets, while mobile network operators (MNOs) compete with commercial banks transactions markets and stored value accounts (see annexes for detailed tables on providers).

Figure 36: Leading DFS Providers¹¹¹

Potential partner	Number of retail customers	Size of distribution network	Geographic coverage
	<ul style="list-style-type: none"> >12M subscribers >7M-Pesa users >1.8M-Pawa users 	<ul style="list-style-type: none"> 85,000 agents 10,000 Lipa na M-PESA merchants 	<ul style="list-style-type: none"> 85% of Tanzania's population covered by 2G, 3G and fiber network
	<ul style="list-style-type: none"> 7.5M subscribers >4M Airtel Money users Timiza users unknown 	<ul style="list-style-type: none"> 20,000 agents No data on Airtel chap chap 	<ul style="list-style-type: none"> 2G and 3G networks as prevalent as Vodacom
	<ul style="list-style-type: none"> >8.2M subscribers >3.4M Tigo Pesa users 100,000 Tigo Kilimo users 	<ul style="list-style-type: none"> ~41,000 agents 50,000 Lipa na Tigo-Pesa merchants 	<ul style="list-style-type: none"> 2G service nationwide 3G services only in Dar es Salaam, Morogoro, Tanga, Dodoma, Moshi, Mwanza and Arusha
	<ul style="list-style-type: none"> 2M customers 500,000 m-banking users 	<ul style="list-style-type: none"> 165 branches 50% of all ATMs 	<ul style="list-style-type: none"> Tanzania
	<ul style="list-style-type: none"> No data on customers available 1.2M sim banking users 	<ul style="list-style-type: none"> 119 branches 130 ATMs 700s POS devices 2200 agents 	<ul style="list-style-type: none"> Tanzania, with 400 MFIs and 225 AMCOs
	<ul style="list-style-type: none"> 177,00 depositors 27,000 borrowers 	<ul style="list-style-type: none"> 17 branches 	<ul style="list-style-type: none"> Only has a presence in Tanzania; mostly urban with interest in rural expansion through agency banking
	<ul style="list-style-type: none"> No data on customers available 10,000 businesses 	<ul style="list-style-type: none"> 1 branch 129 ATMs 3 service centres 	<ul style="list-style-type: none"> Only has a presence in Tanzania, with one branch and three service centers in the Kilimanjaro region

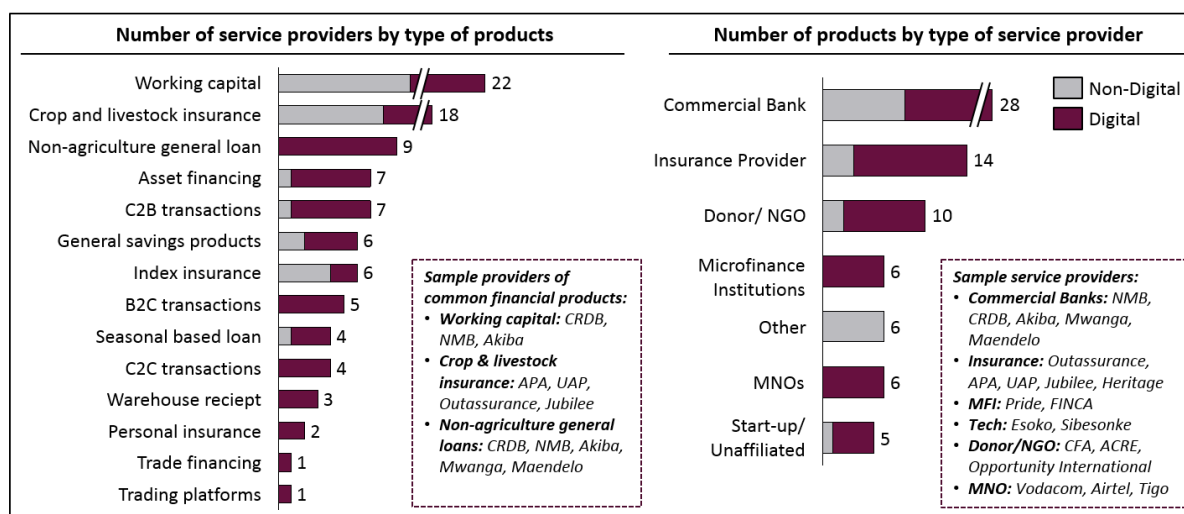
Through secondary research, 95 financial service products across 75 providers were evaluated targeting or clearly serving smallholder farmers and either entirely or partially digital. The following table presents the range of relevant digitally-enabled products and services for smallholder across a range of providers.

¹⁰⁹ Agriculture sector strategy 2010–2014, African Development Bank; World development report 2008: Agriculture for development, World Bank

¹¹⁰ Catalyzing Smallholder Agricultural Finance, Dalberg 2012.

¹¹¹ AFA Tanzania Ecosystem Study, Dalberg 2016.

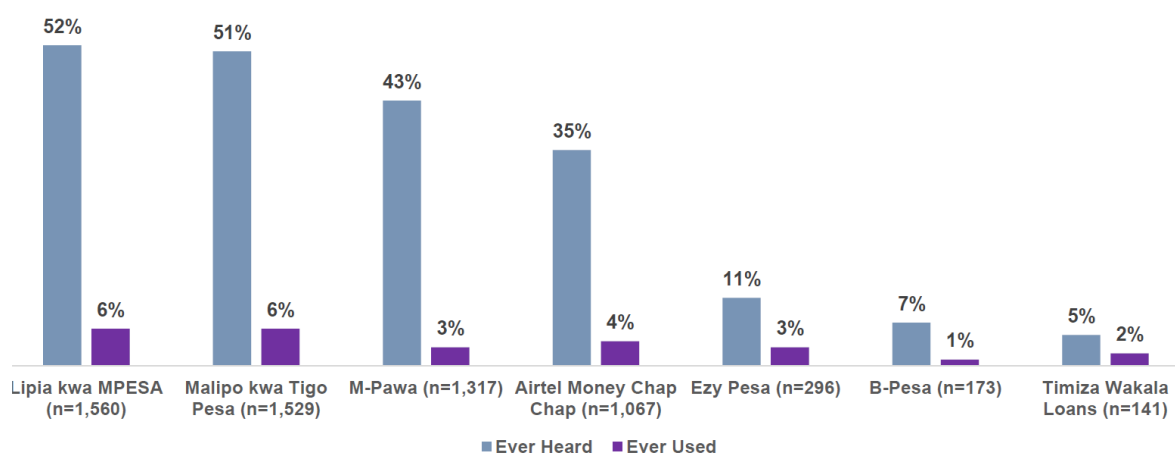
Figure 37: Number of Service Providers and Products Targeting Smallholders



Few formal financial institutions offer products tailored to farmers, especially those that cater to SHF. A few banks such as NMB and Stanbic do highly selective lending at reasonable rates (e.g., 25%) but in highly controlled circumstances (e.g., with deposits as collateral and guaranteed off-takers). As such, most farmers access services such as credit facilities through formal networks and contract buying schemes. The vast majority of farmer credit is accessed through informal channels, including friends and family, moneylenders and informal groups. By using informal mechanisms, farmers make lower incomes/profits as a result of lower access, loan sizes, and frequently high rates. Thru informal services, they do not build financial history, therefore remain in a cycle where they continue to rely on informal services.

Digital financial solutions can be a solution to the challenges associated with informal mechanisms by delivering formal financial services cheaply, efficiently and additionally enabling farmers to build a transaction history. As the 2015 InterMedia study shows, SHF overwhelming access financial services through mobile money, versus banks or NBFIs, and that the ground is laid now for increased adoption based on growing cell phone ownership, richer product offerings and increased. As of now, while awareness of these more complex products is relatively high, usage rates are still quite low.¹¹²

Figure 38: 2015: Mobile money brand awareness and usage



¹¹² Financial Inclusion Insights, InterMedia 2015.

As nearly half of Tanzania's adult population in rural areas does not have access to financial services and there is clearly important room for improvement and expansion of services.¹¹³ AFA's Payment Study completed in 2016 as a subcomponent of this ecosystem study, shows that significant time and investment is required by smallholder farmers to register a sim card and the related mobile money account and the USSD menus offered are often hard to understand and use.¹¹⁴ Simpler registration processes for farmer associations and other farmer groups could be an important step to increasing the use of DFS. Details from the AFA Payment Study, including mobile money tariff structures and KYC requirements, are included in the annexes for further reference.

There are a number of organisations providing support to financial service providers to develop agricultural finance capabilities and a few financial service providers (FSPs) are investing heavily in agrifinance expertise, including the Bill and Melinda Gates Foundation, CGAP, Rabobank, the Financial Sector Deepening Trust and the Private Agricultural Sector Support Trust (PASS). To expand in agriculture, FSPs may require support on product design, market segmentation and development of alternative delivery channels, and many are aggressively seeking that support.

Distribution Channels

Innovations in digital finance have the potential to revolutionize agricultural markets, improving data visibility for supply chain efficiency and creating alternative payment instruments, increasing productivity, lowering costs of distribution and reducing risks. However, robust channels of delivery are critical to make this a reality. DFS, including credit, savings, insurance, transfers and payments, can be provided through alternative delivery channels such as e-vouchers, debit cards, biometric readers and point of sale devices, making distribution more efficient, but scalable networks of service points for farmer onboarding, education, ongoing service and support are still needed.

A significant constraint for SHF access to DFS is the lack of sufficient, affordable and trusted cash agents, merchant acceptance and other digital service points in rural areas. Recent research and mapping by the Helix Institute shows that despite the majority of Africa's population are located in rural areas, only 39% of agents operate in rural areas.¹¹⁵ Rural agents also tend to be clustered around bank branches for funds rebalancing, further reducing convenience of access for more remote farmers. The study also shows that rural agent activity rates are low and liquidity more difficult to access, resulting in high levels of agent dropout. There is significant room for improvement of these channels which could include new actors, and enhance interoperability, product deepening and options for cashless payments.

The AFA program seeks to support the development of increased service points for farmers. The cost of delivery of services may often be prohibitive for providers and farmers alike, and the quality and relevance of services across different delivery channels have important implications for risk management of financial services as well. The review of delivery channels for digital financial and non-financial services to farmers included agent networks, financial service providers, agricultural buyers and farmer organizations, providing inputs into costs, levels and scale of farmer use and trust in each channel. This review focused on understanding the primary and also the potential channels that can be used to reach smallholders across Tanzania with digitally-enabled products and services, both financial and non-financial.

Although it is known to be a competitive market, over half of agents in Tanzania service Vodacom. Rapid expansion of agents and non-exclusivity may be driving lower activity levels per agent and liquidity issues according to the most recent Agent Network Acceleratory Survey by Helix. CRDB is one of the few banks with agents (2,200), which has proven to be a strong deposit mobilization strategy.

¹¹³ Financial Inclusion Insights, InterMedia 2015.

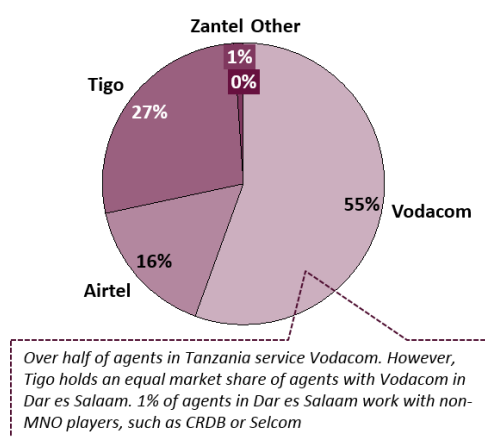
¹¹⁴ AgriFin Accelerate Tanzania Payment Study, Dalberg 2016.

¹¹⁵ GSMA "2013 Mobile Money Usage Survey"

MNOs make up the majority of other agents. Interoperability is making strong inroads in Tanzania and in the capital more than 80% of agents are non-exclusive to a single carrier. But although the majority of the population is rural, only 29% of agents are in rural areas and 79% of agents have been operating for one year or less, with a high level of agency turnover. 82% of agents report facing service downtime.¹¹⁶ New pilots to extend mobile money to merchant payments are in very early stage of testing and development.

Figure 39: Agent Networks & Key Metrics¹¹⁷

Market Presence of National Agent Network (2014)¹



Key Metrics

Agent Demographics:

- MNOs make up majority all the agent network in Tanzania
- 48% of agents are exclusive to their provider country-wide; however, 84% of agents are non-exclusive in Dar es Salaam
- Although majority of the population is rural, only 29% of agents are in rural areas
- 79% of agents have been operating for one year or less; high level of agency turnover

Agent Operations:

- 25% of agents have 21-30 transactions per day; transaction volumes in urban and rural areas are similar
- Only 4% of agents are not profitable and report dropping revenues or making losses
- 82% of agents report facing service downtime

Training:

- 79% of agents report to have received training
- Majority (~61%) received training from their employers, the rest from master agents or employers

Tanzania also has a very active aggregator space, with several aggressively expanding large agent networks. The aggregator model enables master agents to transfer cash float and e-float to their sub-agents as needed, alleviating the burden on services providers to monitor thousands of individual points of transactions and also lower the cost of opening agents in rural areas with lower population density and transaction volumes, as multiple providers can be serviced at a single agent. Major aggregators include:

- › Selcom is a local payments aggregator that powers the bill pay functions for 25+ banks and all four DFS deployments by MNOs. They started rolling out its own agents in 2012. Having started as an airtime super dealer for Airtel, the company now has over 7,000 *PayPoints* where customers can pay bills, buy airtime or perform cash in/out from any of the mobile wallets. On the backend, Selcom also powers mobile banking solutions for many of the banks as well as bulk payment services to the three main DFS wallets (Ezy Pesa is currently being added).
- › Maxcom is also a local payments aggregator that is integrated with banks (many through Umoja switch) as well as all major DFS deployments and has built out a network of around 8,000 agents through which it is enabling an increasing number of functions, incl. cash in/out for DFS wallets. Incubated at DTBi, Maxcom started as an ICT company that was contracted to build bridges for the systems of M-PESA with its agents but now has built a substantial aggregator business and has its eyes on other markets in the region, with 700 agents in Rwanda and active plans for Kenya, Zambia and Ghana. Similar to Selcom, they power mobile banking solutions for various banks. They are already accepting M-PESA merchant payments (hope to soon add Tigo and Airtel) and are about to launch a bulk payment offering.
- › Cellulant opened in Tanzania in 2008 as a gateway for Celtel, but has since gotten involved with bulk SMS, content provision for MNOs and mobile banking (in 2010) offering balance inquiries, check book request, airtime top-up, bank-mobile wallet transfers and bill pay. They currently work

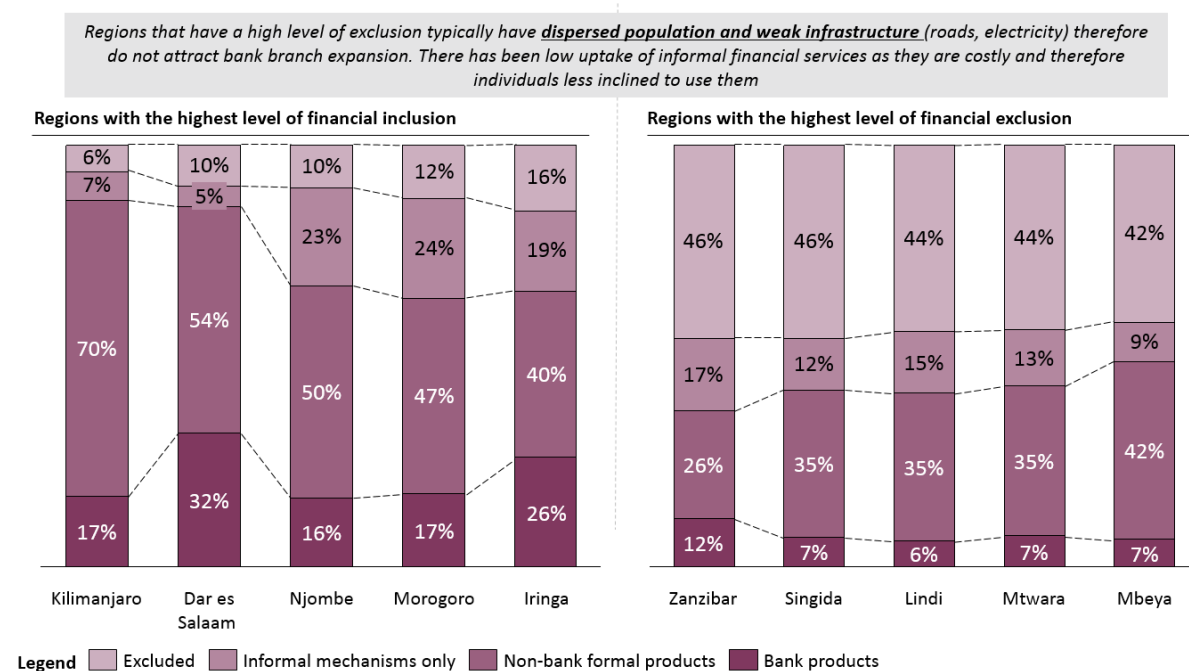
¹¹⁶ Agent Network Accelerator Survey, Helix 2013.

¹¹⁷ AFA Tanzania Ecosystem Study, Dalberg 2016.

with 4 banks, the largest of which is NBC—which does 140,000 transactions per month over the Cellulant platform—and are also developing an app for DTB.

Low cell phone coverage and access to agent networks do not appear to be a major challenge to DFS, with only 9% of farmers citing distance from agents as a key constraint. Still, financial exclusion varies by region from 6% to 46%, with higher levels of exclusion in areas with weaker infrastructure, as identified in the FinAccess Study in 2013, shown below.

Figure 40: Financial Inclusion by Region



Extension workers provide a particularly important channel to farmers, as agricultural experts and often highly trusted advisors. The national ratio of frontline extension workers to farmers in Tanzania however, has been estimated at between 630 to 2,250 farmers per extension worker. Public sector-led extension is provided at the county level based on national level guidelines and is typically supply side driven, offered direct to farmer or through farmer groups by government extension workers. A leading example is the Agricultural Sector Support Development Program, working in 47 counties to strengthen market linkages and pre and post-harvest production capacity building. Government e-extension services are also operating alongside extension services offered by some cooperatives.

NGO-led extension is important in Tanzania and is typically value chain specific, incorporating multiple stakeholders such as public sector, NGOs, farmer organizations and private sector. NGOs typically use a demand-driven & participatory approach offered through farmer groups or farmer to farmer. Leading examples include TechnoServe, Heifer working on the East Africa Dairy Development project and the One Acre Fund, which has recently launched in Tanzania. Private sector-led extension is also a resource, although mainly focused on business objectives of specific buyers and input suppliers. This type of extension is value chain specific, typically working in partnership with cooperatives and farmer groups, often leveraging out-grower schemes and utilizing demand-driven and participatory training approaches. Agro dealers and agro vets have the emerging potential to become an important channel for digital financial service delivery to farmers. The Alliance for a Green Revolution in Africa (AGRA) has intensively invested in agro dealers and agro vets.¹¹⁸ Working with independent agro dealers and agro vets as distribution partners can be challenging, as few are in chains.

¹¹⁸ FinAccess Survey of Financial Service Points, FSDT 2015

Farmer Capability Building

Recent CGAP research indicates that farmer training and ongoing information provision are among the most difficult components to promote farmer adoption and ensure ongoing delivery.¹¹⁹ Currently, there are few effective, financially viable tools and models to meet this need. Capacity building is required in four main areas: digital literacy, financial literacy, farm management and market access skills. CGAP notes that DFS for smallholders requires significant effort and resources, particularly in the early stages of product rollout. Smallholders are typically risk-averse and less experienced with technology and require significant training. Strong multi-stakeholder partnerships are often critical to success. Farmer focus group discussions and desk review on farmer capability indicated a range of constraints related to uptake of DFS in Tanzania, outlined below.

Figure 41: Key Constraints to SHF DFS Uptake¹²⁰

Constraints to uptake of digital financial services	
Financial Literacy	SHFs are not fully aware of the range of digital financial services available to them
	SHFs do not fully understand how to use the digital financial services in the market
	SHFs don't have required budgeting and accounts management
	SHFs don't have required titles for hard assets
Digital Literacy*	SHFs struggle with signing-up for digital financial services
	SHFs have concerns over money loss when using digital services as compared to tangible cash
Farm Management	SHFs do not use the right agronomic practices to enable them to commercialize production and control costs
	SHFs are unable to add value to their produce; limiting revenue
Market Linkages	SHFs are disaggregated and are unable to profitably market their produce
	SHFs are unable to engage long term buyers and acquire soft collateral (eg. forward contracts)

Experience with SHF to date points to the need for technology-enabled solutions to incorporate “human touch” from trusted agents, NGO trainers or extension workers, an area where organizations like TechnoServe are playing a vital role. DFS market actors, however, lack clear models, tools and impact results to help achieve the balance between education and marketing, as well as technology and human-based channels that are needed to drive active adoption of products and services at scale. A key component of the AFA program is the Farmer Capability Lab. The Lab works with partners to develop and test SHF capability tools and sustainable delivery modalities.

Farmer capability is a critical aspect of impactful service delivery, particularly for subsistence-level farmers and those striving to become commercially viable SHF. Field focus group research for this paper identified the following constraints faced by low-income farmers in Tanzania. Nevertheless, farmers clearly aspire for digital information services on their phone. The data below shows that farmers want more abilities to digitally access market, farming, and weather information on their mobile phones. There is still an outstanding question of whether or not farmers are willing to pay for these improved abilities or would they be bundled with credit or loan products.¹²¹

¹¹⁹ Tarazi, “Serving Smallholder Farmers - Recent Developments in Digital Finance”, Focus Note 94, June 2014

¹²⁰ AFA Tanzania Ecosystem Study: Field Focus Groups with SHF. Dalberg, 2015.

¹²¹ CGAP, 2016

Figure 42: Capacity Constraints Faced by SHF

Digital Literacy	<ul style="list-style-type: none"> • Not fully aware of the range of digital, financial and information services available to them • Do not fully understand how to use the digital financial services in the market • Not aware of key MNO contracting information e.g., what happens when a customer loses a SIM card, the cost of using digital services • Struggle with signing up for digital financial services • Have concerns over money loss when using digital services as compared to tangible cash
Financial Literacy	<ul style="list-style-type: none"> • Are not aware of the various financial products available, often relying on perception and hearsay • Continue to use traditional financial services due to cultural norms • Do not have required financial planning and management skills • Perceive formal financial services as expensive to use
Agronomic practices	<ul style="list-style-type: none"> • May not begin farming cash crops because they require new and more sophisticated agronomic know-how • Some continue to use traditional agronomic practices due to cultural norms • Often do not generate enough income to purchase inputs or mechanization • In many regions, although government extension workers exist, they are few and can't support all farmers adequately
Market Linkages	<ul style="list-style-type: none"> • In non-cash-crop related value chains, marketing organizations such as cooperatives do not exist • Farmers are unable to add value to their produce, limiting revenue

A broad range of farmer capability building institutions work across value chains in Tanzania, including those supported by both public and private sector organizations. Vodacom, CGAP, TechnoServe and Arifu, for example, teamed in a pilot to combine farmer group training with interactive mobile phone-based learning on financial literacy which resulted in a 700% increase in farmer savings on digital channels.¹²² Field research indicates, however, that penetration of such services is very low and the sector is in its infancy. The following table presents a range of active VAS players in the agriculture finance and technology space currently.

Figure 43: Farmer Capability Building Initiatives

	Direct to farmer training	General training				
			Poultry	Bananas	Dairy	Sunflower
VC partners	<ul style="list-style-type: none"> • Muvek • BRAC 		<ul style="list-style-type: none"> • RECODA • Banana Investment Ltd • Crop BioScience 	<ul style="list-style-type: none"> • EADDII • ASAS Dairy • Tanga Cooperative • Faida Mali 	<ul style="list-style-type: none"> • Mt. Meru Oli Millers • SNV • CEZOSOPA • TASUPA 	
Agriculture experts	<ul style="list-style-type: none"> • Ministry of Livestock and Fisheries • ILRI 		<ul style="list-style-type: none"> • Crop BioScience 	<ul style="list-style-type: none"> • Heifer International • ILRI • Tanzania Dairy Board • Ministry of Livestock and Fisheries 	<ul style="list-style-type: none"> • Ministry of Agriculture and Food cooperatives • TEOSA 	

Innovative Technology Providers

SHFs are the most underserved group in the world, with women and youth at a particular disadvantage. This is due to a range of factors, including weak infrastructure, poor market linkages and lack of access to information and critical services including inputs and extension.¹²³ Emerging technology innovators

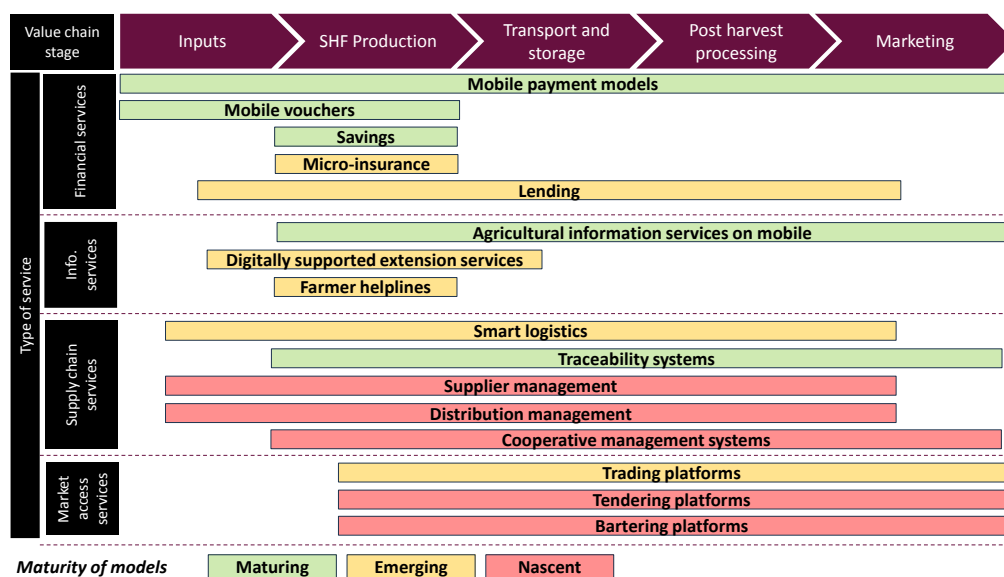
¹²² arifu.com/

¹²³ AgriFin Facility Strategy. World Bank. 2010.

providing services to enhance farmer productivity and access to services are a key players in lowering both the costs and risks of serving farmers. An Aegis study of 115 live, exclusively digital agriculture solutions globally, noted that innovation is being driven by three main groups of actors, led by independent providers innovating on technologies and applications (e.g. remote sensing, credit scoring algorithms, farm planning tools) followed by MNOs and government. These technology innovators are oriented toward solving the tough problems facing smallholders, but often do not have the relationships or networks to achieve scale, and require specific types of support to realize their potential.¹²⁴

A recent study from Accenture and Vodafone outlines a range of opportunities for digitally-enabled services to improve efficiencies and increase incomes for SHF, noting that the greatest potential benefits can be generated by enabling mobile financial services and information¹.

Figure 44: Opportunities for Digital Enablement in Agriculture (Vodafone Accenture)

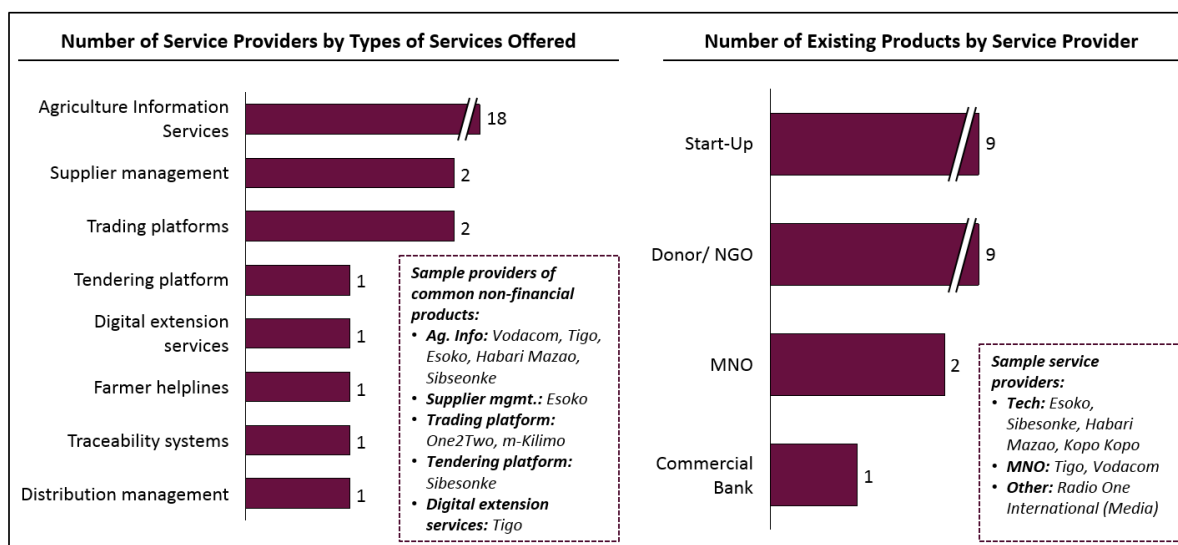


This study provides a landscaping review of innovative solution providers both in Tanzania and across East Africa to identify promising technology firms which can positively impact SHF. Because of the early stage of development of many of these innovative companies, the study also includes a survey of funds and organizations that support technology start-ups in Tanzania, such as accelerators and incubators, which can help increase the scale and viability of their work.

While the space is developing, digital non-financial services or value-added services (VAS) are still relatively limited compared with market leaders in East Africa and there is certainly room for development on this front and product offers mature and scale. Over the course of this study, 27 different services were identified. The most common products are information and extension serves. A few notable solutions have reached significant scale by partnering with multiple banks, mobile network operators and/or aggregators, such as MaxMalipo. Payment models vary across different types of partnerships. For example, banks and MNOs pay First Access for three tiers of data analytics, whereas MedMobile has a direct revenue share with banking and MNO partners. The space is dominated by technology start-ups and NGOs, as presented in the table below.







¹²⁴ GSMA, Digital Entrepreneurship Report, 2014

Figure 45: Digital Value-Added Services Targeting Smallholders¹²⁵



Most digital extension services are typically funded by donors, the government or service providers, although farmers often incur costs of receiving information provided on digital platforms. Some platforms, including Sibesonke, are transferring this cost to input suppliers and other agribusinesses, which has assisted in the overall ability to reach scale. The following table illustrates the business model approaches used by some of the leading market providers in Tanzania.

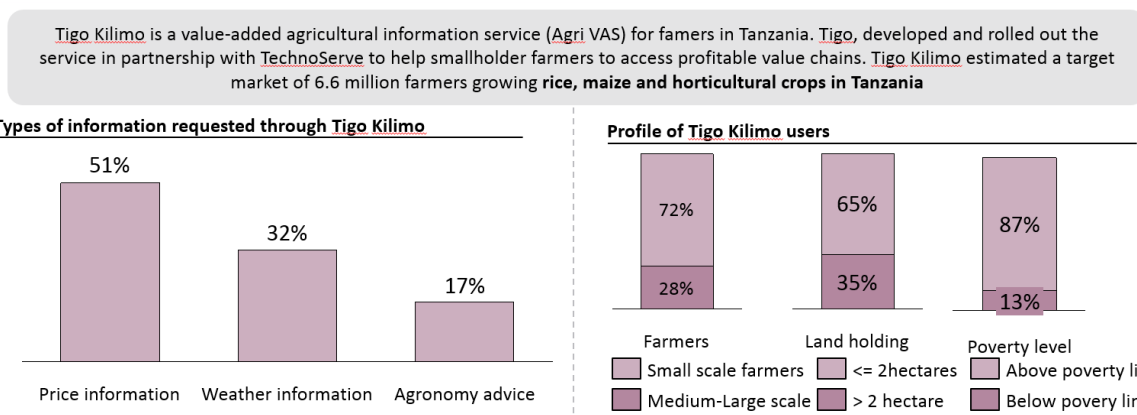
Figure 46: Business Models of Leading Digital Information Service Providers

User fee	Cross-subsidy / Business Investment	Subsidized Models
<ul style="list-style-type: none"> • In this model, the end-user (farmer, COOP, farmer group, business) incurs the cost of the service <p> <i>Tigo Kilimo: Farmers receive SMS' with agriculture and market information for Tshs.44 per text message. Farmers can access helplines for free</i></p> <p> <i>Farmers join farmer clubs for a small fee of ~\$1 paid at the end of the month. Farmer clubs provide agriculture and market price information, as well as free call and SMS within closed group (successful in Ghana)</i></p>	<ul style="list-style-type: none"> • End-users do not pay for the cost of service; cost is incurred by the service provider, who gets to promote their products in the market <p> <i>Sibesonke provides market price information services as well as a tender platform that is paid for by input suppliers as a way to promote their services</i></p> <p> <i>Habari Mazao provides a free service for end-users, however, is funded by 2Seeds Network and payment from MNOs for pricing information</i></p>	<ul style="list-style-type: none"> • End-users do not pay for the cost of service – this is typically incurred by a donor or the government <p> <i>Through the SPADE and STRYDE programs (funded by USAID), TNS provides extension / capacity building services to farmers</i></p> <p> <i>The Ministry of Industry and Trade has extension works to support smallholder farmers</i></p>

While registration numbers are high for digital information services (DIS) solution providers such as Sibesonke and Tigo Kilimo, active use is still elusive and raise some questions about the impact for smallholder farmers which should be actively addressed moving forward. Commercial business models for DIS are also still in its early stages. The following tables present the type of information requests for leading information provider, Tigo Kilimo.

¹²⁵ AFA Tanzania Ecosystem Study, Dalberg 2016.

Figure 47: Tigo Kilimo Agri VAS Service Details¹²⁶



Given the early stage of these companies, an important component of the AFA program is to identify and provide technical support to promising technology innovators reaching SHF, including sponsored accelerator cohorts and targeted business consulting. The landscape of organizations providing funding and technical assistance to technology firms in Tanzania is a core part of the East African impact investing landscape, just behind Kenya and Uganda, and expected to climb.¹²⁷ Tanzania has a generally welcoming regulatory landscape for investors, although the government remains heavily involved in the economy, and is one of the easier countries for conducting business, raking second in the region on the World Bank's East of Doing Business raking.¹²⁸ Agriculture and financial services have typically received the highest interest and share of deals.

The growth of mobile technology has spurred recent growth in the start-up ecosystem. In the technology landscape, there are many incubators, accelerators and challenge funds within Tanzania to focus on proof of concept stages of development but there is also a general lack of funding for start-ups in the ideation and seed stage of development.¹²⁹ While there are a broad range of funding sources available across East Africa, including the Fund for Rural Prosperity and Indigo Trust, there is very high competition for funding and few deal-ready investments. A few government-funded incubators and accelerators do take an equity stake in or provide direct financing for incubators, including the Dar Teknohama Business Incubator (DTBI) and the Small Industries Development Organization Business and Technology Incubator (SIDO). KINU (funded by Google) and BUNI ¹³⁰are two other notable innovation hubs that provide a co-creation and co-working space with emerging formal accelerator and incubation programs. Academic institutions are also providing technical assistance and business development to entrepreneurs.

¹²⁶ AFA Tanzania Ecosystem Study, Dalberg 2016.

¹²⁷ The Landscape for Impact Investing in East Africa: Tanzania. Global Impact Investing Network, 2015.

¹²⁸ www.doingbusiness.org/data/exploreeconomies/tanzania/

¹²⁹ The Landscape for Impact Investing in East Africa: Tanzania. Global Impact Investing Network, 2015.

¹³⁰ buni.or.tz/ & www.kinu.co.tz/

Figure 48: Technology Innovation Support Services¹³¹

Category	Examples of Organizations	Services Offered
Startup incubators	<ul style="list-style-type: none"> KINU, BUNI, SIDO, DTBi 	<ul style="list-style-type: none"> Connection to funding opportunities, only SIDO and SUGECO provide loans Mentorship and training through experts Physical working space and resources Business development services (BDS)
Academic institutions	<ul style="list-style-type: none"> SUGECO, University of Dar-es-Salaam Entrepreneurship Centre 	<ul style="list-style-type: none"> Mentoring, market research services, and BDS
Challenge funds	<ul style="list-style-type: none"> ACEF, TANZICT 	<ul style="list-style-type: none"> Grant funding for startups at various development stages Minimal training and BDS
Sector funds / donors	<ul style="list-style-type: none"> TANZICT, Fund for Rural Prosperity 	<ul style="list-style-type: none"> Grant funding for start-ups and incubators Minimal training / mentorship and minimal BDS
Co-working spaces	<ul style="list-style-type: none"> KINU and BUNI 	<ul style="list-style-type: none"> Provide physical space, peer-to-peer training Minimal BDS, however, both have emerging incubation programs

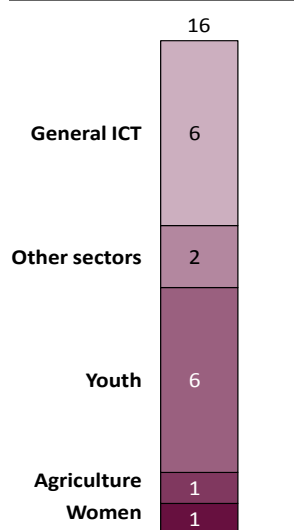
SOURCES: GSMA digital entrepreneurship 2014, donor and investor websites, Dalberg analysis

NOTE: this TA landscape does not include investors – covered in the investment section under “enabling environment”

There are also a number of small, emerging players in the technology start-up space targeting youth, agriculture and women, all focal areas for AFA.

Figure 49: Support Structures for Technology Start-Ups¹³²

Number of players across focus target groups



Sector	Notable Players
Youth	<ul style="list-style-type: none"> NLab: Empower Me! SIDO TWENDE: Accelerating Social Innovation Univ. of DSM Entrepreneurship Centre SUGECO
Agriculture	<ul style="list-style-type: none"> Sokoine University Graduate Entrepreneurs Cooperative (SUGECO)
Women	<ul style="list-style-type: none"> TGT: Tanzania Gatsby Trust Support for SME and Farmer Development

SOURCES: Services provider websites; Accelerator interviews; Dalberg analysis

¹³¹ AFA Tanzania Ecosystem Study, Dalberg 2016.

¹³² Ibid.

Alternative Data Providers

The potential for alternative data, such as mobile phone records or warehouse receipts, and data hosting platforms presents an emerging opportunity to quantify and address risk, tailor product design, and provide farmers with digital records and identities.¹³³ Alternative data (“AD”) is information, not traditionally used by financial service providers that may be used to enable firms to assess credit or insurance risk of an individual. Farmers rarely have traditional data trails like debit or credit card use, or other payment obligations like mortgages or car payments. In the Global South, AD tends to be mobile data; whereas in the Global North, AD tends to be customer payments records such as utilities and e-commerce. AD is in theory highly beneficial for credit risk and pricing, as well as insurance policy and premium pricing, where traditional credit history data is either insufficient or unavailable. For this reason, AD is potentially transformative in the Global South where many people are unbanked or under banked. It can lead to greater financial inclusion, unlocking a client base previously unreached through traditional credit channels.

Traditional credit providers like banks are looking to access new clients in low-income segments where they have not been traditionally active. Specialized AD firms are creating new products (e.g. psychometric analysis) and selling to FSPs to utilize alongside their current credit risk analysis tools. MNOs realize they have a large mines of valuable data they can use to extend services to existing customers and acquire new ones, while technology innovators are capturing new forms of alternative data which may have strong relevance for credit risk analysis. Non-bank financial institutions, consumer lenders and far-sighted commercial banks are pioneering AD use to acquire core markets.

Key trends are already driving the increased relevance of alternative data at the SHF level. Smart phone ownership and access is increasing, handset cost is dropping drastically and mobile banking is growing rapidly. Increasingly, features of the mobile phone enable access, for example using the touch interface of smart phone and easy-to-understand mobile banking applications. Affordable, reliable internet is increasing across the continent with new fiber-optic cables increasing transmission capacity of data.

An element of the AFA program is to support the identification and pilot testing of applications of alternative data and data platforms to support expansion of services to SHF. Our review of alternative data in this study worked to identify what types of experience and opportunities exist in Tanzania to expand access to credit, insurance and other financial services and how AFA can best support those initiatives. We have assessed alternative data (“AD”) models globally, regionally, and in Tanzania across the five main categories of AD: (a) mobile data (b) personal spend data (c) agricultural data (d) informal groups (e) psychometrics. These firms are finding innovative ways to determine credit and insurance risk of hard-to-reach clients (including SHFs).

The nascent use of alternative data in Tanzania is likely to grow, as 11 notable players are utilizing value chain alternative data to support the development of financial products, illustrated in the graph below.¹³⁴

¹³³ Babcock, Lee, “The agricultural mobile finance revolution”, Feb 2014, [http://ictupdate.cta.int/Feature-Articles/The-agricultural-mobile-finance-revolution/\(76\)/1392201374](http://ictupdate.cta.int/Feature-Articles/The-agricultural-mobile-finance-revolution/(76)/1392201374).

¹³⁴ AFA Tanzania Ecosystem Study. Dalberg 2016.

Figure 50: Alternative Data Providers Relevant for Smallholders¹³⁵



The landscape of alternative data providers is comprised mainly of specialist data firms, traditional financial institutions and MNOs. Two main models leverage partnerships between financial service providers and MNOs, followed by FSPs and specialist data firms. In Tanzania, Vodacom and CBA have partnered to underpin and offer the savings and loan product, M-Pawa, while First Access is partnering with FSPs to provide data analytics supporting credit decisions.

Mobile network operators collect rich information from transaction platforms that have been used to develop other digital financial products such as loans and savings (Vodacom’s M-Pawa) and insurance products (Tigo Bima). Third party special data firms collecting satellite images as alternative data is mainly used for designing, assessing risk and verifying payouts for insurance products. Social media may not currently be relevant as a source of alternative data for Tanzania, though usage of WhatsApp may be in the future, as there are currently nine million internet users in Tanzania. Social media use is one of the biggest drivers. The scope for future growth, specifically among young people, is significant aided by the completion of the National ICT Broadband Backbone (NICTBB) and increasing adoption of mobile phones.¹³⁶

Beyond weather index insurance, satellite images are increasingly used to monitor and verify farmer soil and crop conditions. Syngenta has partnered with Century UAP to expand index based insurance to over four thousand smallholder farmers to date, while Planet Labs is producing satellite images to measure crop health, track farm operations and assess crop production for users across agricultural value chains. DigitalGlobe is another actor using remote sensing to detect variability in soil and crop conditions.

As the alternative data space in Tanzania is relatively nascent, opportunities exist to bring in players who have had success elsewhere. Nevertheless, diverse “adjacent” firms in Tanzania are collecting

¹³⁵ AFA Tanzania Ecosystem Study. Dalberg 2016.

¹³⁶ Tanzania’s Internet users hit 9m, The Citizen (March 2014)

new forms of AD as a by-product of some other primary business, such as MKopa, which offers solar solutions and related asset financing to rural households. Some Tanzanians, especially those in rural areas, are also members of groups that sit on a potentially rich mine of paper-based data, including SACCOs and VICOBAs. Buyers, off-takers and middlemen also have detailed records on many of their farmer producers and may offer a valuable source of data, including mobile numbers. MNOs have only recently started to mine mobile usage data as AD – as such they are still working out different uses and are limited in their partners. AFA will move forward to support these types of AD firms to support increased services for SHF as the program develops.

Opportunity Identification and Conclusions

In summary, findings from the Tanzania Ecosystem Study in 2016 support the AFA technical approach around product bundling on digital platforms for farmers. Given the highly fractured and diverse nature of agricultural value chains, which each involve myriad actors, including input suppliers, buyers, mobile network operators, financial institutions, distribution companies (fast moving consumer goods), farmer unions and government, no single player can solve this problem on its own. But given the study findings and the clear potential for increased productivity across Tanzanian agriculture, there is fertile ground for digital platforms to bring these actors together to deliver value to farmers in a cost effective way.

Based on the ecosystem analysis, we focused on identifying pain points for SHFs and opportunities to address these challenges, the role of digital services in addressing these challenges and critical questions for actors within the ecosystem. Our initial focus in this paper is around understanding and meeting the needs of SHF, which are summarized in the table below across financial and non-financial services. Key unmet needs include bridging the gap between informal and formal savings, credit and insurance products to address farm productivity needs, supported by requirements and pricing that they can realistically supply. Improved non-financial services, particularly given the weak extension support for farmers, can augment both the access to and impact of financial services.

Figure 51: Famer Unmet Needs for Financial and Non-Financial Services

		Level of Need	Unmet Need
Financial Services	Transactions	●	<ul style="list-style-type: none"> • Transactions are mainly performed on a cash basis • While mobile money is one of the easiest ways of offering digital financial services, more than 50% of rural populations don't have access to it • Limited mobile penetration is one of the key reasons for limited uptake of mobile money services
	Savings	●	<ul style="list-style-type: none"> • 70% of adults save at home, where money is at risk • Famers have a significant need for savings, because their income is seasonally tied to the harvest, and for much of the year they rely on savings to smooth consumption • Saving options allow farmers to withstand shocks without affecting production
	Credit	●	<ul style="list-style-type: none"> • Current borrowing, when done, is done via informal channels which are very expensive to finance • Formal institutions have strict requirements which many agribusinesses cannot meet • Non-agricultural loans would particularly be beneficial as farmers can to meet their general household needs
	Insurance	●	<ul style="list-style-type: none"> • Unpredictable weather patterns is one of the major reasons for sharp fluctuations in the production levels of food and export crops in Tanzania • Tanzania is losing up to 50% post-harvest losses in agriculture • Agribusinesses currently lack awareness of how to get insurance and how it works
Non-Financial Services	Info. Services	●	<ul style="list-style-type: none"> • There is a major shortage of extension workers, with the ratio as high as 1 extension officer per 1,145 farmers: almost half of the ideal, established at 1:600 • Farmers therefore continue to rely on traditional farming methods, which produce low yields
	Market access services	●	<ul style="list-style-type: none"> • Agribusinesses often rely on incredible sources of information, with most receiving it from middlemen who give below market prices

Key:

Source: Dalberg Analysis (initial insights based on the data presented in this document) ● high ● medium ● low

We have identified opportunities to address these gaps which include both universal services and products tailored to value chains, given the fact that nearly all Tanzanian farm households engage in more than one value chain. Mercy Corps has learned through its pioneering AgriFin Mobile program working in Indonesia, Zimbabwe and Uganda, that farmers must be actively engaged through the design and pilot phase and in a meaningful way over full product implementation. Recent trends to incorporate human-centered design into product development, led by CGAP and others, have yielded promising results in developing more holistic solutions for farmers and farm families, while also leveraging learning

and innovation from outside the worlds of development finance. Breakthroughs of these types will need to be tried and tested through multiple iterations in order to develop successful models that can serve more marginalized farmers, including women and youth.

Figure 52: Strategic Opportunities for SHF Financial Products

Archetype	Description	Proposed prioritized services types
Universal services that address broader farmer needs	These services are not necessarily value chain specific and can be used by a large number of SHFs	<ul style="list-style-type: none"> – General savings products: One of the most important mechanisms to smooth income and enable loan provision – Extension services: An integral part of financial and non-financial service bundles – Trade platforms: An important mechanism for creating broader market opportunities for farmers
Tailor made services that address farmer seasonality and income volatility	These services aim to address challenges that farmers face as a result of unpredictable or seasonal income flows	<ul style="list-style-type: none"> – Seasonal based loans: This type of loan respond most directly to farmers seasonal income requirements
Services that facilitate linkages within value chains	These services do not necessarily target SHFs directly, rather ensure that value chain actors operate more efficiently, ultimately benefiting SHFs	<ul style="list-style-type: none"> – B2C transactions: This service significantly reduces transaction costs for aggregators and ensures greater transparency and record keeping for farmers – Traceability systems: These systems create improved food safety and quality standards, creating better opportunities for sales both domestically and for export – Supplier management: These services improve data and monitoring systems and facilitate effective of farmer outreach and interaction

Tanzania’s financial service providers and MNOs offer 90 DFS products employing various business and partnership models. Despite the large offering, additional work is needed to tailor products to farmer needs (e.g., loan terms that match crop seasonality). Agent networks present a strong opportunity to build farmer capability because they enable direct, personal interaction with farmers. Vodacom has the greatest reach among MNOs, while CRDB has a large bank agent network. The market is competitive, with regulations preventing agent exclusivity.

A critical driver for the innovation needed to transform services for low income farmers is technology focused on solving the tough problems faced in agriculture, including access to markets, reliable information, rapid access to finance to purchase improved inputs and key services, such as mechanization and irrigation. Tanzania is in the earliest stages of capitalizing on these innovations, with 27 DIS products on offer, and all currently lack a commercially viable business model. Future DIS innovation could improve market organization and effective sharing of information, e.g., weather patterns and farmer aggregation models.

However, important groundwork is laid for the expansion of digital services benefiting smallholders, from domestic, regional and international innovators. Companies providing direct digital services for farmers such as Sibesonke, eSoko, and Arifu and alternative data providers such as First Access, Juntos and Acre Africa are laying the groundwork for successful, and impactful service to SHF. The value-added services may be tapped together with financial service providers to reach full fruition.

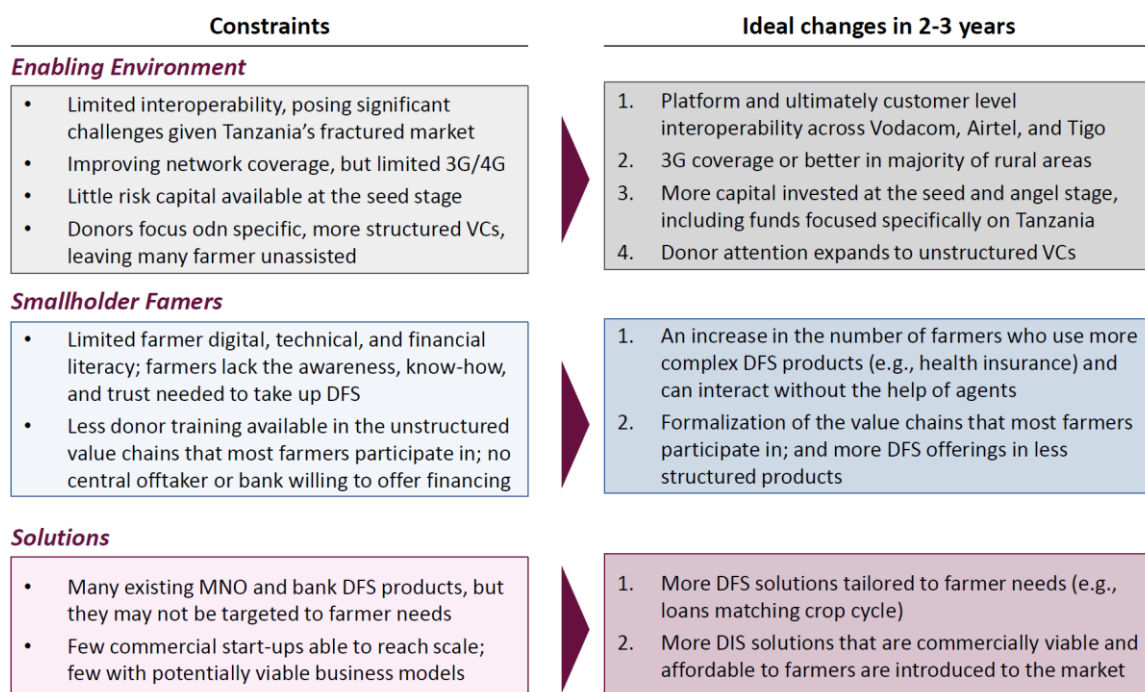
The market still lacks, however, successful business models and commercial and impact proof points to drive the scale needed to overcome the huge and complex environment for millions of African smallholders. In order to support the potential of these ICT leaders in agriculture, AFA includes specific support programming for technology firms innovating in this space, including product development support, in areas that include components listed below.

Figure 53: Opportunities Identified for Non-Financial Services and Alternative Data

- **Traceability:** effective traceability allows for improved food safety and quality standards, creating better opportunities for export sales
- **Supplier management:** improved data and monitoring can facilitate effective farmer interaction including: payments, extension, input provision, quality tracking, linkages, etc.
- **Trading platform:** provide farmers an opportunity sell their crops beyond the market gate cutting out the middle men, giving the farmers visibility over broader market prices
- **Logistics, Tendering and Bartering platforms:** emerging logistics platforms are addressing key infrastructure gaps and helping farmers access markets and improve income
- **Agricultural information services:** informational services complement extension services with climate and market information
- **Cooperative and chama management platforms:** allows group members to transparently track contributions an investments mitigating some of the risks of the service for consumers
- **Extension services:** extension services provide training on full agricultural cycle from field preparation to post harvest techniques
- **Farmer helplines:** are an effective means of communicating with farmers (particularly the illiterate) providing extension and information services
- **Transfer successful global AD models to Kenya** - by facilitating partnerships with local players and buying down risk of market entry
- **Leverage new customer data by adjacent firms** - by supporting firms (e.g. PAYG energy firms, retail) to leverage their customer data as AD and help package and market it to FSPs
- **Digitize paper sources of data** - by supporting organizations (e.g. cooperatives, SACCOs) to digitize, aggregate and leverage data
- **Facilitate partnerships with MNOs to mine mobile data**, by facilitating partnerships with specialist data firms and FSPs to utilize mobile data

In terms of overall ecosystem development, the role of market enablers, including donors, investors, buyers and government, will be vital the development of DFS for farmers. The digitization of basic payment flows through agro dealers, agrovet and other channels to farmers could present major impetus for improvement and is very realistic within the Tanzanian context. The following table presents a number of critical questions that market actors should be thinking about as they engage with SHFs:

Figure 54: Key Constraints and Opportunity Identification






Within this evolving environment, farmer utility and scale of digital services to millions of SHF must remain our goal. Large data gaps remain to be filled to help providers better understand and serve women and youth, as well as promising agricultural value chains that lack clear aggregation. There is still a critical need to understand SHF aspiration, income flows and how best to drive productivity gains, as well to






drive capability for SHF to access and actively use of different services. AFA will continue to share its learning on all of these fronts actively with market stakeholders to help support this shift. In 2016, the program will also publish findings from ecosystem surveys in Zambia, along with ongoing updates of from all three countries over the life of the program.

AFA looks forward to working with ecosystem partners to make this happen.

Annexes

Major DFS Provider Profiles

Potential partner	Reach of Network	Size of Network	Geographic coverage
	<ul style="list-style-type: none"> >12M connected users >7M-Pesa users >1.8M-Pawa users 	<ul style="list-style-type: none"> 85,000 agents 10,000 Lipa na M-PESA merchants 	<ul style="list-style-type: none"> 85% of Tanzania's population covered by 2G, 3G and fiber network
	<ul style="list-style-type: none"> 7.5M connected users >4M Airtel Money users Airtel Timiza users unknown 	<ul style="list-style-type: none"> 20,000 agents No data on Airtel chap chap 	<ul style="list-style-type: none"> 2G and 3G networks as prevalent as Vodacom
	<ul style="list-style-type: none"> >8.2M subscribers >3.4M Tigo Pesa users 100,000 Tigo Kilimo users 	<ul style="list-style-type: none"> ~41,000 agents 50,000 Lipa na Tigo-Pesa merchants 	<ul style="list-style-type: none"> 2G service nationwide 3G services only in Dar es Salaam, Morogoro, Tanga, Dodoma, Moshi, Mwanza and Arusha

Potential partner	Reach of Network	Size of Network	Geographic coverage
	<ul style="list-style-type: none"> 2M customers 500,000 m-banking users 	<ul style="list-style-type: none"> 170 branches 50% of all ATMs 	<ul style="list-style-type: none"> Tanzania
	<ul style="list-style-type: none"> No data on customers available 1.2M sim banking users 	<ul style="list-style-type: none"> 60 branches 130 ATMs 700s POS devices 2200 agents 	<ul style="list-style-type: none"> Tanzania, with 400 MFIs and 225 AMCOs
	<ul style="list-style-type: none"> 177,00 depositors 27,000 borrowers 	<ul style="list-style-type: none"> 17 branches 200 ATMs 	<ul style="list-style-type: none"> Tanzania
	<ul style="list-style-type: none"> No data on customers available 	<ul style="list-style-type: none"> 200 ATMs 	<ul style="list-style-type: none"> Tanzania – Dar es Salaam
 <p>Mwanga Rural Community Bank</p>	<ul style="list-style-type: none"> 10,000 businesses 	<ul style="list-style-type: none"> 1 branch 129 ATMs 3 service centers 	<ul style="list-style-type: none"> Tanzania – Kilimanjaro region

Application Criteria for Store of Value Accounts

The Know Your Client (KYC)/Anti Money Laundering (AML) requirements differ per the type of account a customer applies for. The table below reflects the requirements set to open a store of value account per the relevant account provider, either a Commercial Bank or MNO, website.

Application Criteria	Deposit Account		Electronic/Mobile Money			
	Traditional Deposit Account (NMB, CRDB, Akiba)	Mobile Money Account(NMB, CRDB etc.)	Vodacom M-Pesa	Airtel Money	Ezy-Pesa	Tigo-Pesa
Active Sim Card			✓	✓	✓	✓
ID - Passport, Drivers License, Voters ID card	✓	✓	✓	✓	✓	✓
Proof of address documentation	✓					
Existing account with Bank		✓				
Adult (min 18 years)	✓	✓				

The Tanzanian government now by law requires that all sim cards purchased in Tanzania should be registered to an identified and verified customer using photo identification. As Tanzania does not have a national Identity Document (ID), any form of identification with the customer's picture will be accepted. The following documentation are acceptable forms of identification namely i) a valid passport, ii) an employer ID, iii) a voter registration card, or iv) a valid driving license. This regulatory change lowers the barrier to obtain a mobile money account as the requirement to purchase a sim card is the same as that required to open a mobile money account.

For Commercial banks, the KYC/AML requirements remain stringent. In addition to a picture identity document, applicants are required to provide proof of residence. The following documentation is acceptable i) an introduction letter from ward leader/executive, ii) a certificate of occupancy, iii) signed lease agreement, iv) a utility bills (DAWASCO or TANESCO or TTCL bills) the clients own name, v) a government/local authority bill (example property tax, land rent receipt). These KYC requirements pose a challenge for Commercial banks to provide store of value accounts to smallholder farmers, as many do not possess the required documentation. Some banks have piloted accounts with lower account functionality (e.g. preset account transaction limits) as a result of the limited KYC performed on the client. The uptake of these accounts has been successful, however a lack of understanding of the account limitations has resulted in frustrated clients who are unable to transact above the preset limits without additional KYC.

Mobile Money Tariffs (Dec. 2015)

Table below reflects the tariffs payable by consumers. The tariffs calculated have been determined based on a transaction size of TZS 50,000 (USD 23)

	Electronic/Mobile Money			
Service	Vodacom M-pesa	Airtel Money	Ezy Pesa	Tigo Pesa
Cash in	Free	Free (Range: TZS 1,000 – 3 million) USD 0,5 – 1 389)	Free	Free (Range: TZS 1,000 – 3 million) (USD 0,5 – 1 389)
Cash out – TZS 50 000	TZS 2 200 (USD 1,02)	TZS 1 750 (USD 0,81)	TZS 1 400 (USD 0,65)	TZS 2 000 (USD 0,93)
Send money (TZS 50 000) to network customer/ network partner	TZS 600 (USD 0,28)	TZS 450 (USD 0,21)	TZS 350 (USD 0,16)	TZS 500 (USD 0,23)
Send money (TZS 50 000) to non network customer/ network partner	Transfer fee + withdrawal fee	TZS 2 400	TZS 1 820	Cash in + Cash out charge for amount sent
Balance Enquiry	TZS 60 (USD 0,03)	TZS 40 (USD 0,02)	TZS 50 (USD 0,02)	TZS 50 (USD 0,02)
Bills payment	Free		Free	
Government 2 Person payments	N/A	N/A	N/A	N/A

Source: Mobile Network Operator websites

Tiered Account Structures¹³⁷

Account Type	Maximum Transfer Size	Daily Transfer Limit	Maximum Account Balance	Customer Due Diligence Requirements
TIER 1	TZS 1,000,000 (US\$ 615)	TZS 1,000,000 (US\$ 615)	TZS 3,000,000 (US\$ 1,845)	Customer shows ID to the agent
TIER 2	TZS 3,000,000 (US\$ 1,845)	TZS 5,000,000 (US\$ 3,075)	TZS 5,000,000 (US\$ 3,075)	Customer shows ID to the agent, who makes a copy that the provider stores
TIER 3	TZS 12,000,000 (US\$ 7,380)	TZS 50,000,000 (US\$ 30,750)	TZS 1,000,000,000 (US\$ 615,000)	Customer shows ID, Tac Payer Identification Number (TIN) and business licence to the agent, who makes copies that the provider stores.

Relevant DFS Regulation¹³⁸

Regulatory Environment defined as the laws and regulations which govern the Tanzanian payment system. The following regulations have been reviewed for this study

- Banking of Tanzania Act, (2006)
- Electronic Payment Schemes Guidelines (*issued by BOT, May 2007*)
- Tanzania Inter-Bank Settlement System Rules and Regulations (Bank of Tanzania Act, *Section 5A and 66B, 1995 as amended in 2003*)
- Guidelines on Agent Banking for Banking Institutions (*issued by BOT, 2013*)
- National Payment Systems Act, 2015

¹³⁷ “Mobile Money for the Unbanked”, GSMA & Bill and Melinda Gates Foundation.

¹³⁸ AgriFin Accelerate Payment Study, Dalberg 2015.



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