FERTILE GROUND SERIES

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

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

MERCY CORPS | AGRIFIN ACCELERATE

Supported by

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List of Acronyms / Specialized Terminology

AD	Alternative Data
AFA	AgriFin Accelerate program of Mercy Corps, supported by The MasterCard Foundation
B2B	Business to business payment
B2C	Business to consumer payment
BFA	Bankable Frontiers Associates
BoZ	Bank of Zambia
CGAP	Consultative Group to Assist the Poor
Co-ops	Agricultural Cooperatives
DAPP	Development Aid from People to People
FSDZ	Financial Sector Deeping Zambia
PPI	Progress out of Poverty Index
SHF	Smallholder Farmer (s)
ZamPost	Zambia Postal Services Corporation
ZANACO	Zambia National Commercial Bank
ZAMACE	Zambia Commodity Exchange
ZICTA	Zambia Information and Communications Technology Authority
ZNFU	Zambia National Farmers Union

Key Country Statistics

Figure 1: Zambia General Indicators

Indicator	Unit	Zambia
Total Population (2016)[1]	#	16.93 million
Rural population (2016)[1]	% of population	60.3%
Population density[2]	People/km^2	21.8
Female population (2015)[2]	% of population	51.2%
Population age below 15 (2015)[2]	% of population	45.9%
Population age 15 – 64(2015)[2]	% of population	51.2%
Population age >65 (2015)[2]	% of population	2.9%
Population below poverty line ($1.25/day, 2010)[2]	% of population	74.3%
GDP per capita (2016)[2]	$	$1,231
CPI inflation (2016)[2]	%	19.1%

Figure 2: Zambia Key Financial Inclusion Indicators for Population over 16 or 18 years

Indicator	Unit	Zambia
Financial access points[3]	#	14,194
Financial access points density[4]	#/10,000 adults	17
Commercial bank branches[5]	#	370
No of bank accounts[6]	# / % age 10+	2 million / 14%
No of mobile money accounts[7]	#	3.4 million
No of non-bank financial institutions[5]	#	215[8]
Saved any money[9]	% age 16+	28.9%
Saved at a financial institution[6]	% age of savers	35.5%

Figure 3: Kenya communications indicators, 2016[10]

Indicator	Unit	Zambia
No of Mobile Phone Subscribers	#	11.3 million (71%)
No of Internet Users: mobile	#	5.7 million (35.6%)
No of internet users: fixed	#	35,960 (0.22%)
No of MNOs & MVNOs	#	3
No of registered SIM cards	#	12.1 million

[1] WorldOMeters: http://www.worldometers.info/world-population/zambia-population/ accessed 7 December, 2016
[2] Knoema: https://knoema.com/atlas/Zambia accessed 7 December, 2016
[3] http://finclusionlab.org/country-insights/zambia: Lusaka: 2,814; Copperbelt:2,148, Southern: 1,999; Central: 1,745; Muchinga: 1,690; Eastern: 1,129; Western: 905; Northern: 772; Luapula: 530; North-Western: 462
[4] MIX Zambia GIS Mapping 2016
[5] FSDP Progress Report, 2015
[6] ZICTA, 2015. ICT Survey Report
[7] Bank of Zambia (link)
[8] 146 post offices, 32 NatSave branches, 37 MFIs with over 180 access points in Zambia
[9] FinScope 2015
[10] ZICTA website

Figure 4: Mobile Network Operator Market share for Voice and Mobile Money[11]

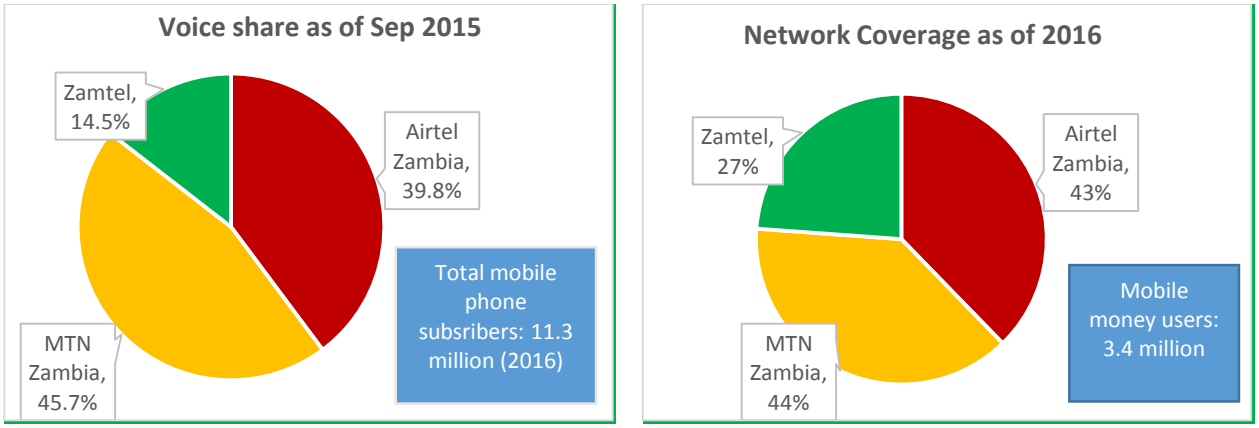
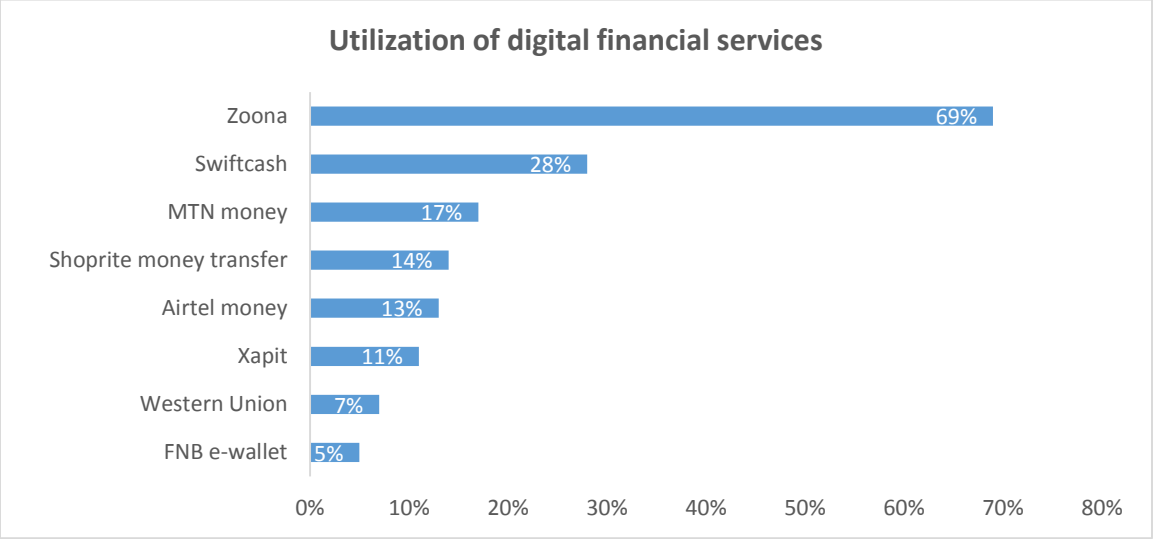
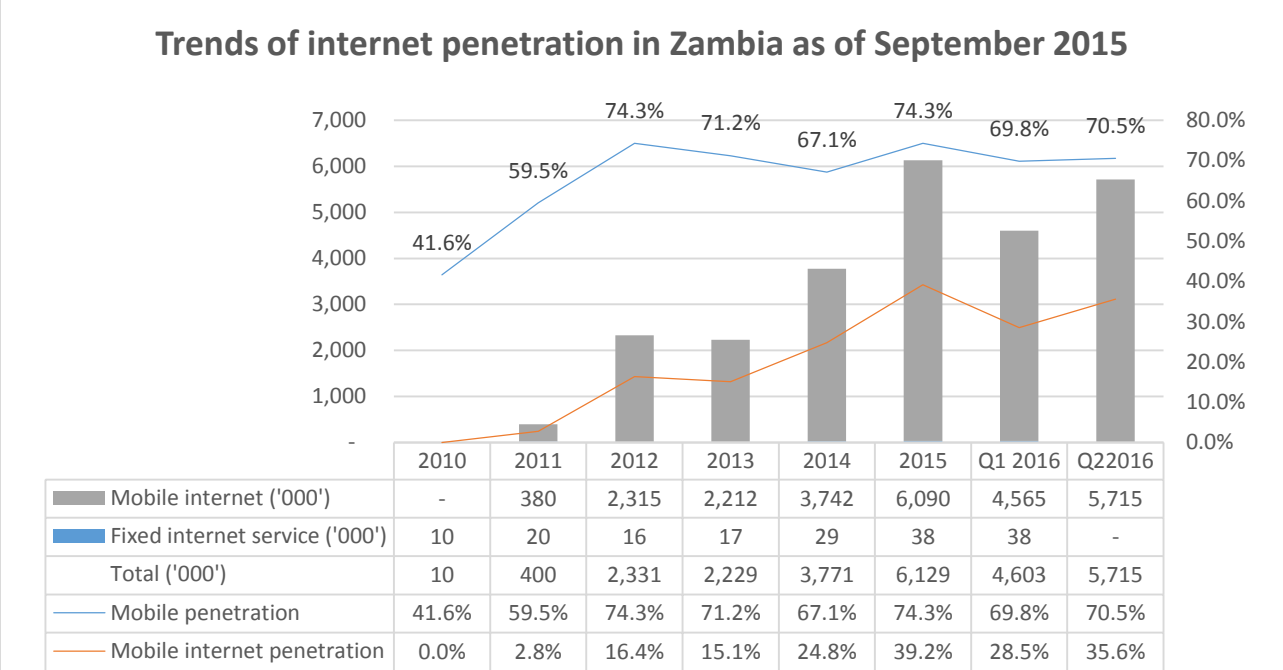


Figure 5: Utilization of Digital Financial Services by Individuals Who Have Used DFS before[12],[13]



[11] ZICTA: Information and Communications Technology & Postal Services INVESTMENT PROFILE; ZICTA website
[12] ZICTA: SURVEY ON ACCESS AND USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGY BY HOUSEHOLDS AND INDIVIDUALS IN ZAMBIA, 2015
[13] Zamtel launched a mobile money product in 2016

Figure 6: Trends of internet penetration in Zambia as of June 2016[14]



	2010	2011	2012	2013	2014	2015	Q1 2016	Q22016
Mobile internet ('000')	-	380	2,315	2,212	3,742	6,090	4,565	5,715
Fixed internet service ('000')	10	20	16	17	29	38	38	-
Total ('000')	10	400	2,331	2,229	3,771	6,129	4,603	5,715
Mobile penetration	41.6%	59.5%	74.3%	71.2%	67.1%	74.3%	69.8%	70.5%
Mobile internet penetration	0.0%	2.8%	16.4%	15.1%	24.8%	39.2%	28.5%	35.6%

[14] ZICTA website http://onlinesystems.zicta.zm:8585/statsfinal/ICT%20Indicators.html

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This publication has been prepared on behalf of The MasterCard Foundation under the leadership of Mercy Corps in its capacity as an Implementing Partner, with technical engagement from Dalberg Global Development Advisors. We would like to thank The MasterCard Foundation for its generous support, along with the team from Dalberg that conducted the initial research for the study. Special thanks to Naoko Koyama, John Kidenda, Samuel Killewo and Miriam Kilimo from Dalberg, Angela Madara and Lucy Kioko from AgriFin Accelerate, as well as our reviewers, Oswald Jumira and Sieka Gatabaki from AgriFin Accelerate, Olga Morawczynski and Anne Maftei from the MasterCard Foundation, Guy Vanmeenen and Joackim Kasonde from FSD Zambia, and John Mundy from the WFP Zambia.

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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.mercycorpsafa.org). Building on learning from Mercy Corps' AgriFin Mobile program operating in Zimbabwe, Uganda and Indonesia, as well as our ongoing work in Kenya and Tanzania, 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[15] 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 Zambia Ecosystem study conducted over a three-month period from June to August, 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 five sections: 1) Introduction to the White Paper; 2) Executive Summary; 3) Zambian 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 needs 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.

[15] AFA defines an ecosystem as a critical mass of touch points for SHF (including buyers, suppliers, farmer unions, banks, insurers, MNOs, government), relevant products (including payments, savings, credit, and insurance), a high degree of market trust and strong user experience to facilitate an efficient and sustainable market infrastructure

Executive Summary

Nearly one and a half billion poor people live on less than US$1.25 a day.[16] 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 by a large part of the developing world, contributing significantly to poverty reduction and food security[17]. 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.[18] 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.[19] 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.[20]

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 recent McKinsey study estimates that mobile and Internet technology can drive up to $3 billion in annual agricultural productivity gains by 2025.[21] 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.[22] 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

[16] IFAD, Smallholders, food security, and the environment, 2013
[17] Peck, Anderson, "Segmentation of Smallholder Households: Meeting the Range of Financial Needs in Agricultural Families", 2013.
[18] Ibid.
[19] Agriculture sector strategy 2010–2014, African Development Bank; World development report 2008: Agriculture for development, World Bank
[20] Dahlberg, "Catalyzing Smallholder Agricultural Finance", 2013
[21] McKinsey, "Lions Go Digital; The Internet's Transformative Potential in Africa", 2013.
[22] Grossman & Tarazi, "Serving Smallholder Farmers: Recent Developments in Digital Finance", CGAP Focus Note, June 2014.

them. At the same time, farmers often lack the information, trust and capacity to access and productively utilize new products and tools.

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.*

This White Paper outlines the major findings of the AFA Zambia Ecosystem Study (ZES) which was conducted from June to August 2016 with Dalberg Global Development Advisors on behalf of the program and the MasterCard Foundation. The study takes an ecosystem approach to understanding the 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. The main objective of the White Paper is share findings from the study 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. Subsequently, AFA will conduct annual representative farmer benchmark studies which will also be made public.

Key Study Findings: Fertile Ground

AFA has selected Zambia as its third country of focus given the nascent state of digital financial services (DFS). Following from Kenya which is considered a leader in DFS through the work of providers including Safaricom's M-PESA and Equity Bank, and Tanzania a vibrant, innovative and competitive market for DFS, AFA will seek to transfer lessons learnt from these two countries to accelerate DFS for smallholder farmers in Zambia.

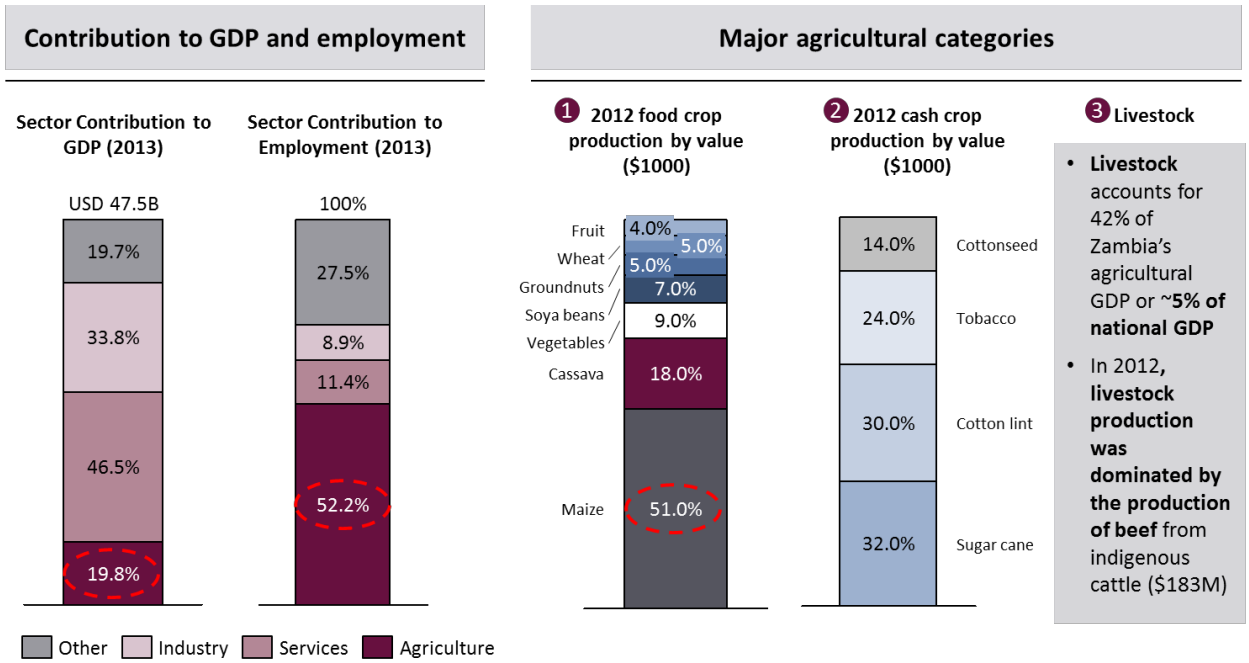
Historically, Zambia has been a relatively stable country and has shown strong economic growth, with an average annual rate of 7% between 2010 and 2014[23]. However, most recently, certain global and domestic macroeconomic factors have strained Zambian economy resulting in a decline in growth (3% in 2015, ~4% in 2016). Falling copper prices, political tensions during the 2016 elections, increasing power outages, El Nino-related poor harvests, and depreciation and instability of the kwacha have stifled the country's growth. With a Gini coefficient of 55.6, Zambia has a very unequal income distribution, with about 60% of the population living below the poverty line and 42% considered to be living in extreme poverty. This is quit alarming and much higher than the other countries in which AFA operates where 42%[24] and 36%[25] Kenya and Tanzania populations, respectively, lives below poverty line. The population configuration of Zambia is also heavily skewed towards the youth; 66% of the population is below the age of 25, similar to 60% in Kenya and 64% in Tanzania[26].

Like most African countries, agriculture plays a significant role in Zambia's economy, contributing to 20% of the country's GDP, ~10% of total export earning, and providing employment for 52% of the population. With the current economic challenges, the government is renewing its focus on agriculture. Maize is the single largest food crop by production volume, grown by majority of smallholder farmers, while cash crop production value of Zambia is fairly evenly distributed across sugar cane, cotton, and tobacco (see figure

[23] World Bank: http://www.worldbank.org/en/country/zambia/overview
[24] https://www.unicef.org/kenya/overview_4616.html
[25] http://opportunity.org/what-we-do/where-we-work/tanzania-facts-about-poverty
[26] CIA World Fact Book

below). With the dominance of maize cultivation, Zambia struggles with low crop diversity, making the country vulnerable to food insecurity should maize production fall due to disease or bad weather. Over 80% of farmers grow maize and less than 50% of farmers grow more than 2 crops on their farms. In addition, production is erratic due to dependence on rain-fed agriculture, making Zambia an unreliable producer for both domestic and export markets. Market actors such as the World Food Program, Harvest Plus, Zasaka, Amatheon, amongst other are pushing for diversification of crops and are providing a market for farmers growing crops like soya beans, cow peas among others.

Figure 7: An overview of Zambian agriculture sector: contribution to economy and major crops



The Government of Zambia has historically prioritized agriculture and provides a high level of support to the sector through input subsidization and providing guaranteed markets for major food crops such as maize. The country spends approximately 8% of its national budget on agriculture, although majority of this budget goes to maize subsidy programs through FISP and FRA.[27] This level of involvement however also creates distortion in the market characterized by inefficiencies that can ultimately lead to market failures. For example, the input subsidy program and government maize purchase puts significant pressure on private input providers and traders, respectively, limiting the development of sustainable market infrastructure.

Zambian agriculture is faced with a number of challenges such as drought, El Nino, land degradation, poor access to yield enhancing technologies, poor agronomic skills (such as mono-cropping, poor animal husbandry), unreliable markets and low agro-processing capacity. In addition, there is very weak engagement in agriculture by financial service providers therefore limiting access to finance – a key challenge that AFA is keen to address. Despite these challenges and given the abundance of resources in the country (Zambia has a large land resource base of about 42 million hectares of which only 1.5 million hectares is cultivated each year[28]), Zambia has the potential to be the food basket of the region (exporting

[27] IAPRI April 2016: An In-depth Analysis of Zambia's Agricultural Budget: Distributional Effects and Opportunity Cost
[28] Zambia Development Agency: Promoting Economic Growth and Development

to Zimbabwe, Malawi, Mozambique, and South Africa). For this to happen it will be important to ensure that farmers diversify their crops to sustain food and nutritional security of the country, adopt mechanized farming and smart agriculture, as well as digital solutions to enhance crop production.

The State of Financial Inclusion in Zambia

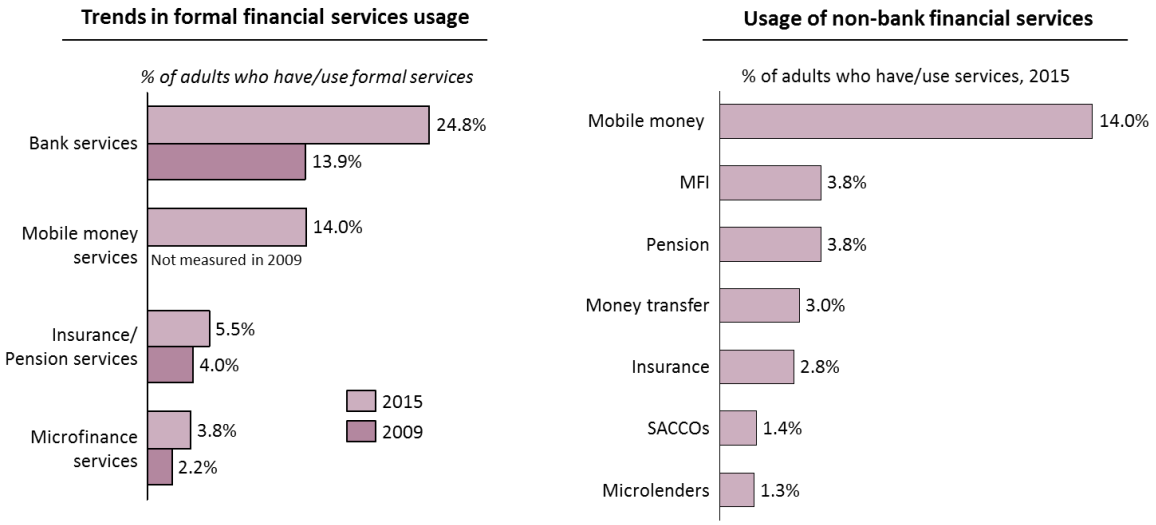
The financial sector in Zambia is relatively small, comprising of 19 commercial banks with approximately 370 branches (Zanaco, Barclays, and FBZ own about 50% of all ATMs and branch networks in Zambia)[29]. Majority of these banks are foreign-owned. The five largest banks (Barclays, Standard Chartered Bank, Zanaco, Stanbic, and Finance Bank) account for the bulk of total banking assets[30]. The non-bank financial institutions include: 8 leasing companies, 4 building societies, 1 development bank, 1 savings and credit bank, 1 Development Finance Institution, 57 bureaux de change, 1 credit reference bureau and 35 micro-finance institutions.

Over the past six years, Zambia has become increasingly financially included as financial providers increase their footprint across the country. FinScope reports that exclusion levels have dropped from 62.7% (2009) to 40.7% (2015) with financial inclusion among men being higher than among women (57.4% of adult women are financially included vs. 61.2% of adult men). This growth is driven both by formal and informal channels: formal inclusion increased from 23.1% of adults in 2009 to 38.2% in 2015, whereas informal inclusion increased from 22.2% of adults in 2009 to 37.9% in 2015. Mobile phones have played the most significant role in bringing about financial inclusion to SHFs and mobile services are the most used non-bank financial services. In fact, the most significant increase in usage of financial services has been in electronic payment / money transfer services (increased by 2.4x from 15.5% to 36.8%) and in savings services (increased by 1.9x from 17.1% to 32.5%).[31] While mobile money has led to the rise in formal FSP usage, informal FSPs (saving groups/ i.e., Chilimbas, local money lenders, money transfer through local buses, friends / family) remain the dominant FSP for rural Zambians[32]. Mobile money use is, however, still nascent at 14%, despite more than 75% of the population owning a mobile phone. The penetration rate is even smaller for women; 9.5% of women have mobile accounts vs. 14.9% of men, according to Findex 2014.

As shown in the figure below, use of banks and mobile money has significantly increased in the past six years while insurance / pension and MFI services have only seen a marginal rise.

[29] Financial Sector Development Plan (FSDP) Progress Report 2015
[30] Making finance work for Africa https://www.mfw4a.org/zambia/financial-sector-profile.html
[31] FinScope Zambia 2015
[32] FSDZ Financial Diaries 2016

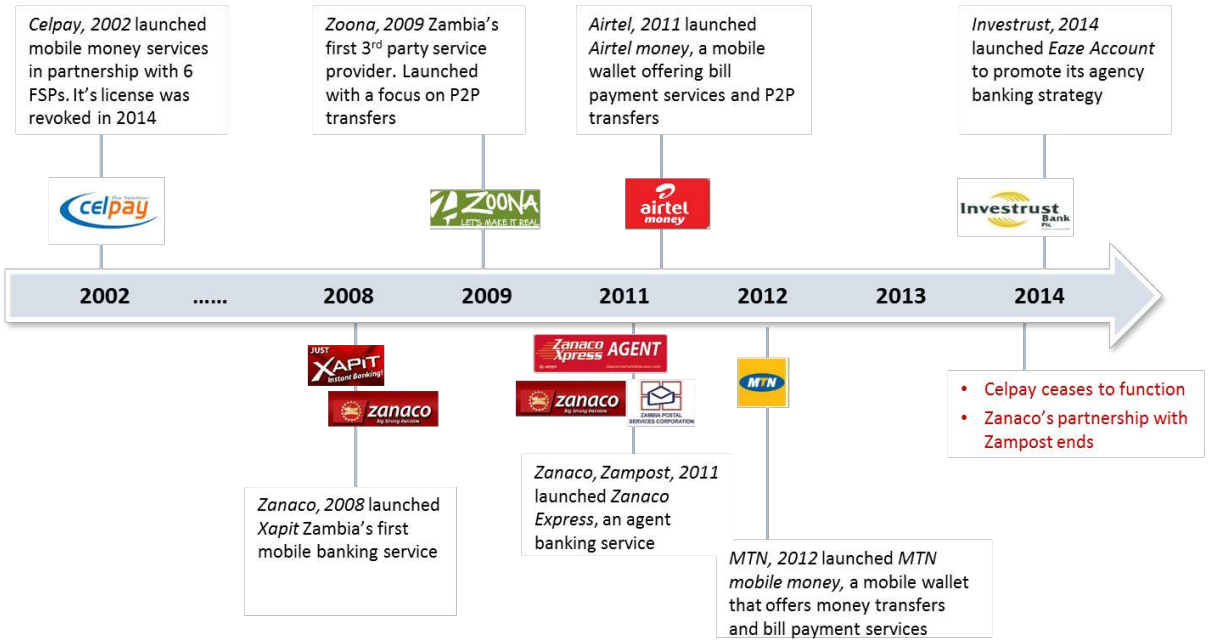
Figure 8: Levels of formal/bank and non-bank financial services[33]



Digital Financial Services (DFS) in Zambia

Zambia was the earliest user of DFS in Africa when Celpay launched in 2002. Over-the-counter (OTC) mobile money services were later introduced by Zoona in 2008, three years before wallet-based mobile money came to the country.[34] Although a pioneer in DFS, there has been very minimal traction in Zambia, compared to other markets in Africa such as Kenya and Tanzania.

Figure 9: Timeline of Digital Financial Services in Zambia[35]



[33] FinScope Zambia 2015
[34] Agent Network Accelerator Survey: Zambia Country Report 2015
[35] Helix: Agent Network Accelerator Survey: Zambia Country Report 2015

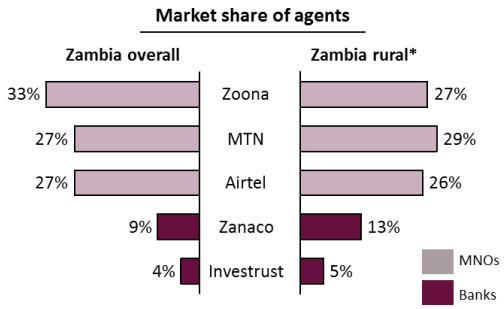
Despite the early start, Zambia still has low uptake of DFS solutions. There are three models of digital financial services that currently exist in Zambia[36]:

1. **OTC solutions – Zoona, Shoprite Money Transfer, Western Union, and SwiftCash**: offer money transfers and bill payments. Transactions are done over the counter using agents in kiosks to conduct these transactions. Zoona leads in digital transactional services with 69% of all DFS users having used Zoona. Before Zoona, SwiftCash was the leader in remittance and money transfer services. SwiftCash has a strong geographic distribution in Zambia, given ZamPost's robust post office network with at least one post office in every district.
2. **Wallet-based solutions – Airtel Money, MTN Money, and FNB e-Wallet**: offer P2P transfers, bill payments, bulk payments, and deposits through the mobile wallet. Transactions are USSD enabled, although agents report both wallet-based and OTC usage. Although mobile money subscribers have reached 6M, less than 10% of them are active on a 30-day basis. Among other things, low awareness, trust, and lack of capable agents account for the low activity
3. **Card - based solutions – Xapit, ZNFU Visa Prepaid Card (Zanaco), and Investrust (Eaze Account)**: offer P2P transfers, bill payments, and savings through an account. Transactions are both mobile and card-based, although similar to wallet-based solutions, agents report both account-based and OTC usage. There is a steady growth in bank channels including ATMs, branches and POS devices. In the past decade, ATMs and POS devices have increased at 29% CAGR. In the same period, number of MFIs has increased by 25% CAGR while insurance firms, agents and brokers have increased at 16% CAGR

OTC solutions penetration is slightly higher than wallet-based solutions. In fact, majority of adults use mobile money service to send or receive money (56.8% and 49.1%, respectively), while only 22.6% use mobile to store or save money. However, given how nascent the DFS landscape is, Zambia could mature to an OTC market (like Pakistan) or become either a wallet-led market (like Kenya) or a bank-led market (like South Africa). The dominance of OTC limits the ability of service providers to offer more products as account opening and activity remain low. For the DFS in Zambia to grow into a more mature mobile money or mobile banking market and move beyond payments, a more sophisticated ecosystem is needed. Decisions made by market stakeholders (e.g., mobile operators, regulators, the government, Bank of Zambia) could move the market in either direction. Current data suggests that DFS in Zambia, particularly in rural areas may be caught in a sub-scale trap, not having a critical mass of users, providers, nor delivery channels – this is yet to be confirmed given the lack of recent publicly available data. Zambian agents have the lowest profitability of the AFA countries (median profits are $42, $95 and $77 in Zambia, Tanzania and Kenya respectively). There is a need to concurrently attract new users and providers (resellers, retailers, and agents) in order to drive scale.

[36] Helix: Agent Network Accelerator Survey: Zambia Country Report 2015; Interviews with Stakeholder during AFA Ecosystem Study, Dalberg 2016

MNOs and commercial banks typically drive access to DFS through their networks of agents distributed throughout the country. In Zambia, agent networks are still underdeveloped, compared to other African market leaders. At 1,400, Zoona has the most number of active agents in Zambia. Agency banking has grown since 2014, with Zanaco and Investrust having a network of over 500 agents each. However, with only ~4,000 active agents, the agent network needs to be strengthened before DFS can have higher usage[37]. Kenya, for example, has over 100,000 mobile money agents resulting in about 59% or the adult population using mobile money, which translates to about 26 million mobile money accounts, and monthly mobile money transaction value of about 190 billion.[38]



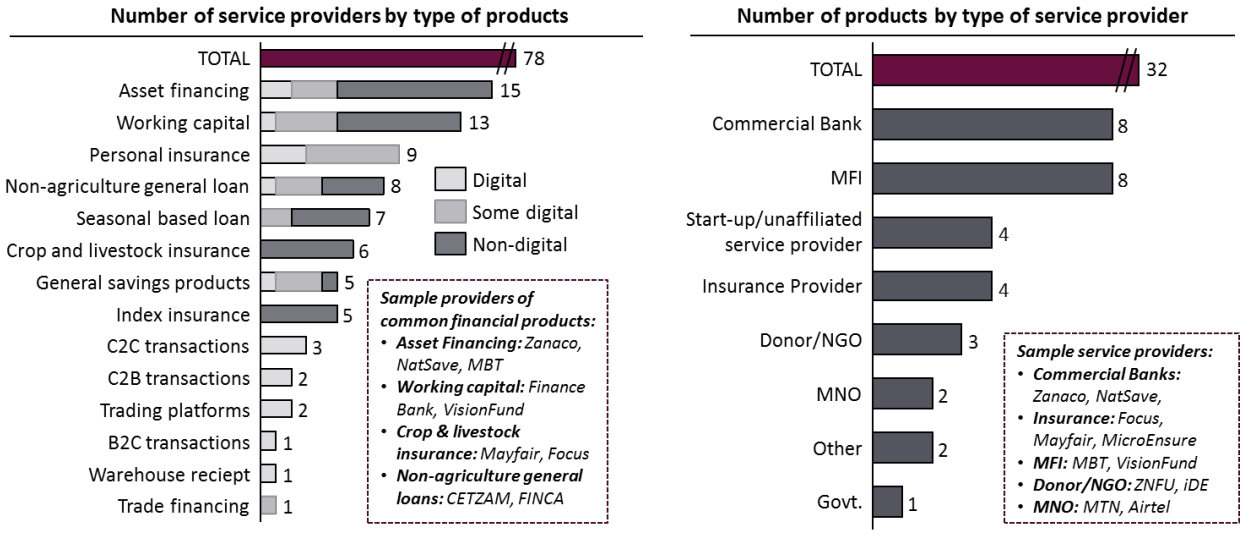
Digital Financial Services (DFS) Targeting SHF

Although there are quite a number of financial products targeting farmers, many cater to commercial and emergent farmers. The most common financial products are asset financing and working capital loans and about half of the products having some digital compatibility. As expected, commercial banks offer the highest number of number of products. However, service providers are starting to collaborate with at least one other provider to roll out products e.g., Standard Chartered has partnered with MTN and Airtel for their **Straight 2 Bank wallet** – a bulk payment platform to allow payments from the bank to mobile wallets**;** Airtel, Micro Ensure and Focus General Insurance for the **Airtel Life Insurance** – a free life insurance service for Airtel customers, based on airtime usage, and MTN with Jumo for **MTN Kongola** – a loan product where MTN mobile money and airtime usage are utilized to determine loan size eligibility. The potential for partnership and market collaboration has not yet resulted in successful or scalable models in Zambia, so this is a strong area for program focus moving forward.

[37] Helix: Agent Network Accelerator Survey: Zambia Country Report 2015; Interviews with Stakeholder during AFA Ecosystem Study, Dalberg 2016

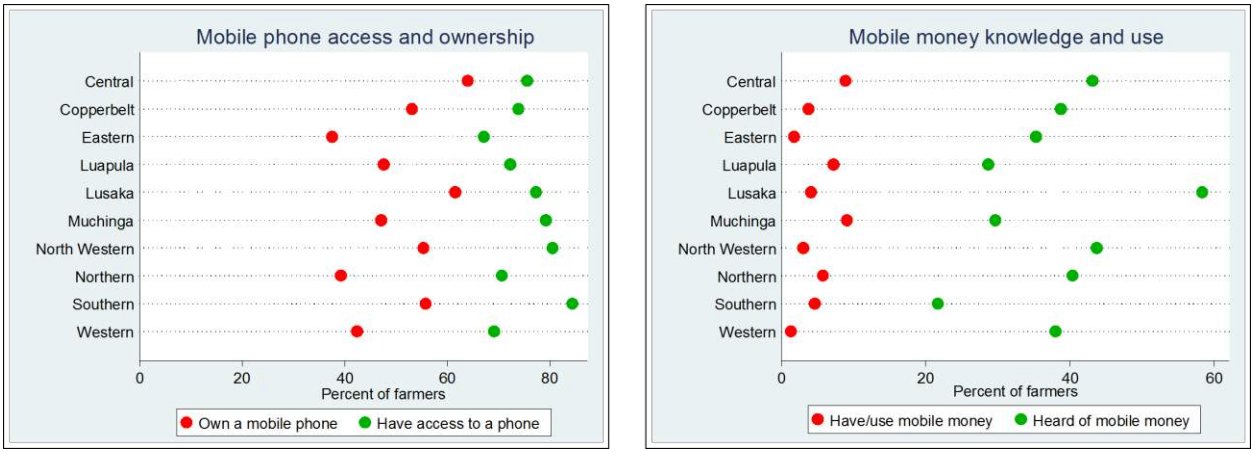
[38] GSMA, The Kenyan Journey to Digital Financial Inclusion, 2014

Figure 10: Digital Financial Services Targeting SHF



Despite this increase in innovative digital financial services, knowledge and use of DFS, and in particular mobile money, still remains low especially amongst farmers (14% vs. 5%[39]). Given the importance of digital platforms for AFA interventions, we wanted to understand how prepared the Zambian market is for DFS; to this end, we engaged Bankable Frontiers Associates (BFA) to develop a simple *mobile money readiness index* (MMRI) that would inform AFA strategy. This index was based on analyzing socio-demographic data from FinScope 2015. The table below presents sample indicators used to gauge overall preparedness for DFS in Zambia, specifically among rural / farming population.[40] The MMRI takes into account metrics such as phone access, phone ownership, awareness and use of mobile money, preference for cash, willingness to use mobile money to pay for utilities, level of education, age, etc. The full score card can be found in the Annex 1.4.

Figure 11: Key Indicators of preparedness for digital financial services, among Zambian farmers



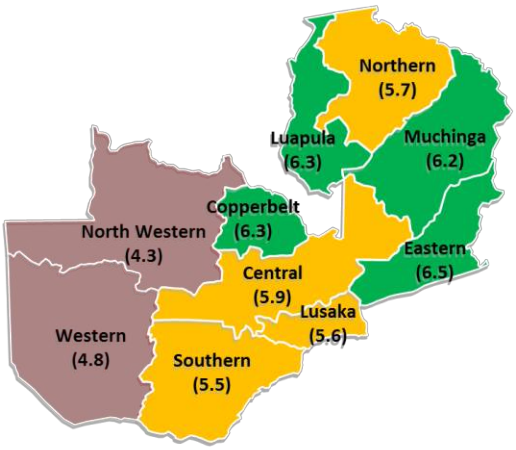
[39] FinScope Zambia 2015

[40] Bankable Frontier Associates (BFA) analysis of FinScope Zambia 2015 data

The snapshot of the analysis of these indicators demonstrates that farmers in Central and Lusaka provinces have the smallest gap between access and ownership of a mobile phone. While the majority of farmers in Lusaka have heard of mobile money, they are one of the least likely groups to have or use it. As would be expected, middle-aged, higher educated farmers are more likely to adopt mobile money. On average, women were less likely to adopt mobile money.

Further analysis aggregating these indicators shows that farmers in different provinces and districts have different likelihood to take up mobile money. Specifically, farmers in provinces like Eastern, Copperbelt, Luapula, and Muchinga have a high MMRI score and would most likely take up DFS. Districts with high MMRI tend to be clustered around major cities or towns, indicating that peri-urban farmers are more likely to take up DFS than rural farmers; this is to be expected given nearness to DFS access points and overall better infrastructure , whether roads or connectivity.

Figure 12: Mobile Money Readiness Index (MMRI) for Zambian farmers[41]



Key:	
<5	Scores between 0 – 5 | low mobile money readiness
5-6	Scores between 5-6 | medium mobile money readiness
>6	Scores greater than 6 | high mobile money readiness

Mobile Money Readiness Index (MMRI) scores for top 22 districts (> 6 out of 10)

1. Eastern	6.5
Nyimba	8.0
Mambwe	7.3
Chipata	6.5
Katete	6.2

2. Copperbelt	6.3
Kalulushi	8.4
Ndola	7.9
Luanshya	7.8
Chingola	6.5
Kalomo	6.1

3. Luapula	6.3
Kawambwa	6.9
Nchelenge	6.8
Mansa	6.5

4. Muchinga	6.2
Mpika	7.0
Isoka	6.8
Mafinga	6.5
Nakonde	6.1

5. Central	5.9
Kabwe	7.6

6. Northern	5.7
Mpulungu	6.4
Kasama	6.2
Mungwi	6.2

7. Lusaka	5.6
Chongwe	6.2

8. Southern	5.5
Siavonga	7.4

Understanding SHFs

One of the likely causes of the disconnect between a relatively robust number of providers and effective uptake of formal financial services by farmers may be weak understanding of SHF needs, preferences and behaviors and related product offerings. To address this issue, AFA embraces farmer-centric design in our work with partners. Early results from interviews with stakeholders and initial field research shows that farmers are 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.

Smallholder farmers in Zambia can be segmented into three broad categories based on the level of commercial activity:

[41] BFA analysis of FinScope Zambia 2015 data

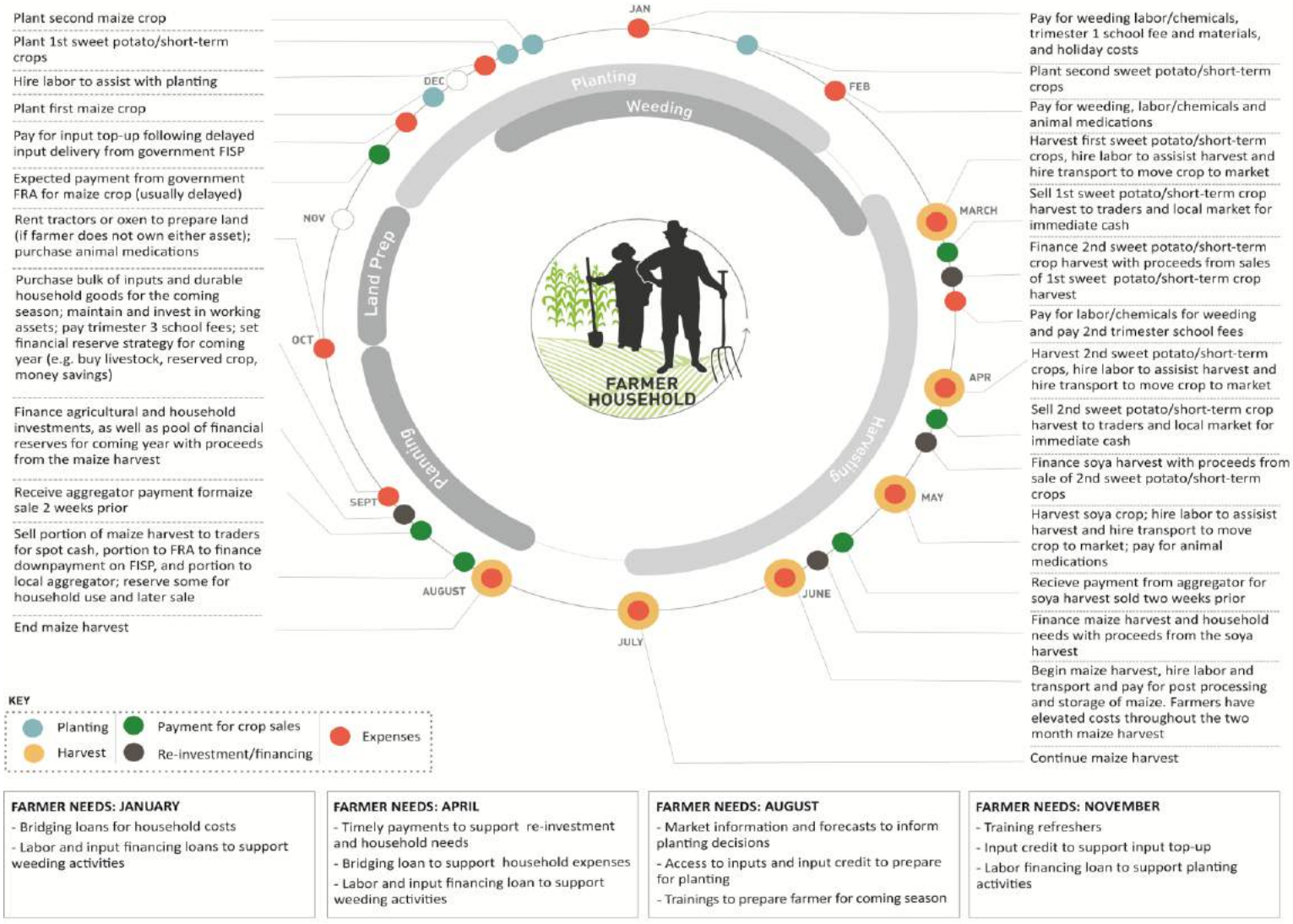
- **Subsistence farmers:** this category constitutes majority of smallholder farmers in Zambia. Subsistence farmers consume as much or more than they produce. They typically farm on less than 2 acres of land and comprise mostly of SHFs earning under $2.50 per day. Farmers in this segment are considered below the scale to service an MFI loan
- **Vulnerable-but-viable SHF:** these farmers alternate between being net buyers and net sellers of produce. They typically farm between 2 and 5 acres and these include SHF earning under $2.50 per day. Farmers in this category are considered capable of servicing an MFI loan
- **Emergent SHF:** this category constitutes of farmers who produce more than they consume and tend to farm at least 5 acres of land. It includes SHFs earning under $2.50 per day. These farmers are considered eligible to service a commercial loan

Given maize is a significant value chain in Zambia, SHFs are also often segmented based on their interaction with that value chain i.e., net buyers (27%), net sellers (42%), and non-buyers and sellers of maize (31%)[42].

Our ecosystem study conducted in June – August 2016, shows the SHFs face a myriad of challenges that cut across the entire value chain. These include: lack of access to affordable, high quality inputs; poor agronomic (farming and animal husbandry) skills; over-reliance on rain-fed agriculture; limited access to high value markets; lack of access to financial services including affordable credit, insurance, timely payment, and savings facilities. Through our work with our strategic learning partner Dalberg, we start to understand the farmers' seasonal map (figure below) which highlights the aforementioned challenges for SHF and when in the farming cycle they occur. Understanding this cycle, as well as the specific needs for the different SHF segments is important for financiers, input providers, extension workers, amongst other stakeholders in identifying the right design and timing of interventions targeting SHF. For example, from the map below we see that farmers typically start purchasing input in September. For financial institutions and input providers, this implies that any products and services offered around inputs (input credit, agro tips on what inputs to use when etc.) need to be designed and disseminated prior to August/ September in order to be useful to farmers.

[42] IAPRI facts about Zambia agriculture sector 2014

Figure 13: SHF seasonal map



Serving SHF is a complex puzzle for providers and involves specific risks that lenders typically do not confront across their product portfolios. However, market opportunities await the providers who can break through and offer 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 value chains in order to help drive scale of outreach and impact: cotton, tomatoes, soya beans, and dairy. A snapshot of the key value chains reviewed is included below.

Figure 14: Mapping to identify value chains with significant output value and smallholder participation

Value chain portfolio for AFA: of cotton, tomatoes, soya beans, and dairy

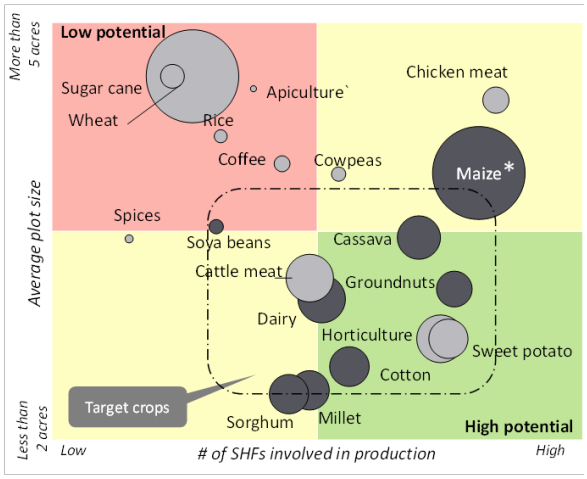
Large value chains

- **Cotton:** 600,000 SHFs with over 200,000 participating in an e-voucher subsidy program run by the ZNFU. **~350,000 contracted to members of the ZCGA†. 95% of cotton producers are small holder farmers**
- **Tomatoes:** ~500,000 SHFs cultivate tomatoes. Cultivated in every province in Zambia. 17% of tomato growers are in female headed HH**. Low capital intensity reduces entry barriers for women and youth. Opportunity to bring SHF into structured supply chain for large off-takers** (Shoprite)

Semi-structured value chains

- **Dairy**: 310,000 households** keep cattle and **produce 70% of milk** in Zambia. **Fairly structured VC** with an extensive network of milk **aggregation points and a large processor** (Parmalat). **Opportunity to transfer learnings form AFA Kenya and Tanzania**
- **Soya beans: 133,000 SHFs accounting for 15% of soya output**. Mostly sold to processors of animal feed and oil **providing AFA strong market actor partnership opportunities**. Increasing demand provides AFA with **opportunity to support increased production by SHFs** to fill market need

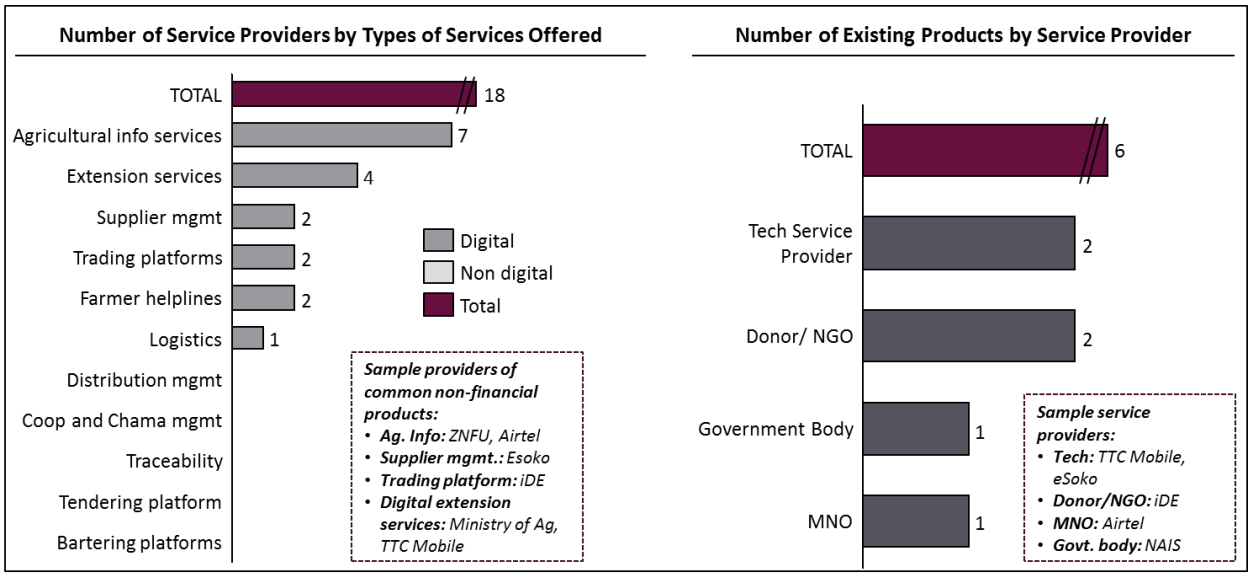
Proposed value chain portfolio represents a combination of mass market crops and more structured value chains



Value Added Services (VAS)

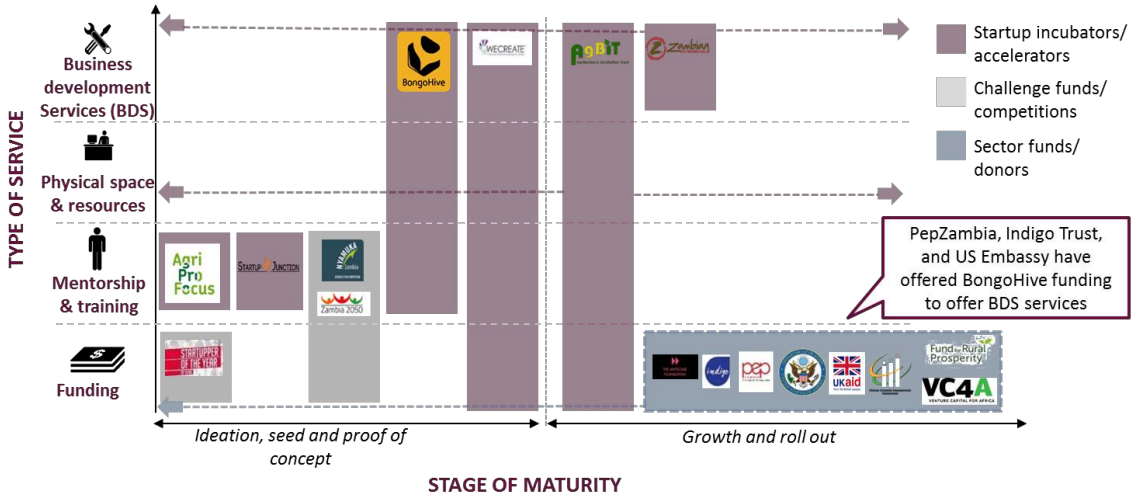
A critical driver for the innovation to transform services for SHF are emerging technology companies; these typically focus on solving the tough problems faced in agriculture, including access to markets, information, improved inputs and infrastructure. DFS in Zambia is very nascent, and so are the innovative value-added service providers (VAS) that would typically enable impactful service to SHF. Digital non-financial services or agricultural VAS are still relatively limited in Zambia compared to Kenya and Tanzania. The few that exist are struggling to reach scale and primarily focus on information and extension services. NGOs and technology service providers are the most common non-financial service providers, although government bodies are beginning to adapt traditional non-financial services to digital platforms. We also see clear interest and potential, however, for regional and international VAS to enter and serve the Zambian market.

Figure 15: Digital Non-Financial Services Targeting SHF



Reflective of the early stage DFS and VAS space, investment and support for technology innovators and VAS providers is also quite limited. Very few incubators and accelerators exist in Zambia – the first technology and innovation hub, BongoHive, opened in 2011. Other accelerators and incubators include: AgriProFocus, AgBIT, WECREATE, Startup Junction, and Zambian Entrepreneur. These generally provide business development services (BDS), networking, mentoring and linkages to external funding sources. These services are common across all the accelerators/incubators; but specifically, BongoHive and WECREATE are the only players that provide both co-working spaces and incubation programming. AgriProFocus links entrepreneurs with different agriculture networks, while AgBIT provides formal incubation for agriculture focused startups. Startup Junction and Zambian Entrepreneur bring startups together for networking, mentorship and exchange of ideas. Most funding for startups is available through participation in challenge fund competitions (Zambia 2050, Startupper of the Year, Nyamuka). Donors such as Indigo Trust, the US Embassy, DFID, and MasterCard Foundation have supported the growth of accelerators and incubators, as well as entrepreneurship and technology training in Zambia. Annex 1.6 provides more information on this landscape.

Figure 16: Incubator and funding models based on stage of maturity and type of service



Conclusions and Opportunities

Smallholder farmers in Zambia face a myriad of challenges that limit their productivity and income levels which fall into two broad categories:

Macro-level challenges that are not unique to SHF: in the Zambia context these include unfavorable weather conditions (frequent drought and only one rainy season) which result in low production levels and limited annual income; fluctuating global copper prices leading to high inflation rates; high poverty rates in Zambia, especially among rural populations and smallholder farmers. Although these challenges are to a large extent uncontrollable, with the right resources, SHF can themselves mitigate some of these challenges through crop diversification, investment in irrigation and other forms of mechanized farming to improve production levels and diversify income sources.

Challenges unique to SHF, resulting from limited access to services and products: majority of the challenges that smallholder farmers in Zambia face are however unique to them and require targeted interventions. These include lack of access to affordable and well-tailored financial products to account for seasonality in income, limited access to high quality inputs, and lack of stable and high-value markets. SHF also lack information, incentive structures, or the necessary resources to promote better agronomic practices. As such there is still an overdependence on rain-fed agriculture and mono-cropping practices, with majority of farmers growing maize partly because the government provides a guaranteed market. Lastly, SHF in Zambia are focused on primary production, there is virtually no value addition at that level.

The service providers who serve SHF also face challenges, with the biggest issue being the problem of last mile delivery. Due to the low population density in Zambia, it is very costly to deliver both financial and non-financial services to rural populations hence we see low uptake of existing services and overall poor engagement in the sector by major services providers, including banks and MNOs. In addition some government policies such as input subsidies, guaranteed market for maize, and policies banning export of maize cripple private sector actors and does not promote a sustainable market. For DFS providers, significant infrastructure constraints (roads, connectivity, agent and merchant networks etc.), low productivity levels of farmers, general preference for cash, and lack of understanding / trust of DFS slow

down the development of innovative services and products for smallholders. There is also a lack of scale "tipping point" in the agent network to provide sufficient touch points, which is essential for DFS to thrive.

Although significant, these challenges present an opportunity to support SHF and facilitate the potential of Zambia to be a bread basket in the region. There is a strong push from the government for agricultural development as part of its strategy to diversify the economy and reduce dependence on mining.

For AFA, we see the following strategic opportunities to drive meaningful change and support expansion of digital financial and non-financial services to smallholders in Zambia:

(i) Working with financial service providers to establish demand-driven and customer-centric products that meet farmers' needs and a commercially viable: with few successful financial products targeting SHF, it will be important for service providers to improve how they design and rollout products. There are behavioral and attitudinal barriers for farmers which need to be addressed during product design to ensure uptake and active use – for example lack of trust of non-bank financial service providers, preference for cash etc. Recent global trends to incorporate human centered design (HCD) into product development 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.

(ii) Providing affordable and relevant financial services: our initial HCD research in Zambia showed that asset financing to promote mechanization of agriculture, insured credit, working capital for aggregators, and non-agricultural loans were the most demanded products by SHF and considered important financial tools in increasing their productivity and income. Given there is only one planting season in Zambia, we see significant gaps in the income of farmers and rural populations. Bridging loans like M-Shwari in Kenya and M-Pawa in Tanzania, are important tools to not only mitigate these economic shocks for farmers but also important in creating a digital footprint for farmers which can eventually facilitate access to other financial products or simply larger loans. With the significant impact of the 2016 drought on farmer productivity, we see a big opportunity to push innovative insurance products including crop, livestock, index insurance

(iii) Building the capacity of smallholder farmers: Improved non-financial services, particularly given the weak extension support for farmers, can augment both the access to and impact of financial services. Farmer trainings will need to be focused on financial literacy, digital literacy, and technical skills such as diversification of crops, agro tips, and better animal husbandry.

(iv) Identifying relevant delivery channels to facilitate last mile delivery and market access for SHF: in Zambia, we see farmer organizations and cooperatives primarily serving as a means for farmers to access input subsidies, although many are inactive outside FISP season. However, they can be still be leveraged to access structured groups of farmers. Agrodealers play a significant role, providing inputs, credit, and aggregating produce. They are a trusted farmer service point and thus an important channel to engage when thinking about serving smallholder farmers. In order to promote uptake of DFS for rural populations, there is a need to build out rural agent and merchant networks which can provide farmers with touch points for financial and non-financial services.

(v) Regional integration: as we work in Zambia to prepare the ground for innovation and growth in a DFS environment that is still very nascent, we propose tapping regional innovators in East and

Southern Africa around financial and non-financial services that can help farmers' diversity, increase productivity, and access high-value markets.

(vi) ***Creating an enabling environment for Zambian agriculture and agriculture financing:*** although outside the mandate of AFA, during the ecosystem study we noted some policy changes will be imperative in order to support other efforts and strengthen the enable environment for Zambia. Specifically, it will be important to assess the government subsidies and export restrictions and consider either reducing the level of market interventions, or reducing frequent policy changes which make it difficult to plan and cause market distortions. When it comes to agriculture financing, in order to promote access to finance, service providers need to explore use of non-traditional forms of collateral to promote access to credit – these could include using a chief's title to secure loans or alternative data and e-ID initiatives to help more farmer reach services

Meaningful expansion of DFS for the country's underserved populations, including SHF, women, youth, and rural populations can start addressing some of these challenges and lower the cost of service delivery, but this is not enough. 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. A more systemic approach with different ecosystem actors tackling different challenges simultaneously is needed to grow an efficient and sustainable market infrastructure. **Ultimately, we see two important triggers to growing DFS in Zambia, particularly for smallholder farmers: (1) designing relevant products that are customer-centric, and (2) increasing the access points through which farmers and rural populations can access and utilize these products.**

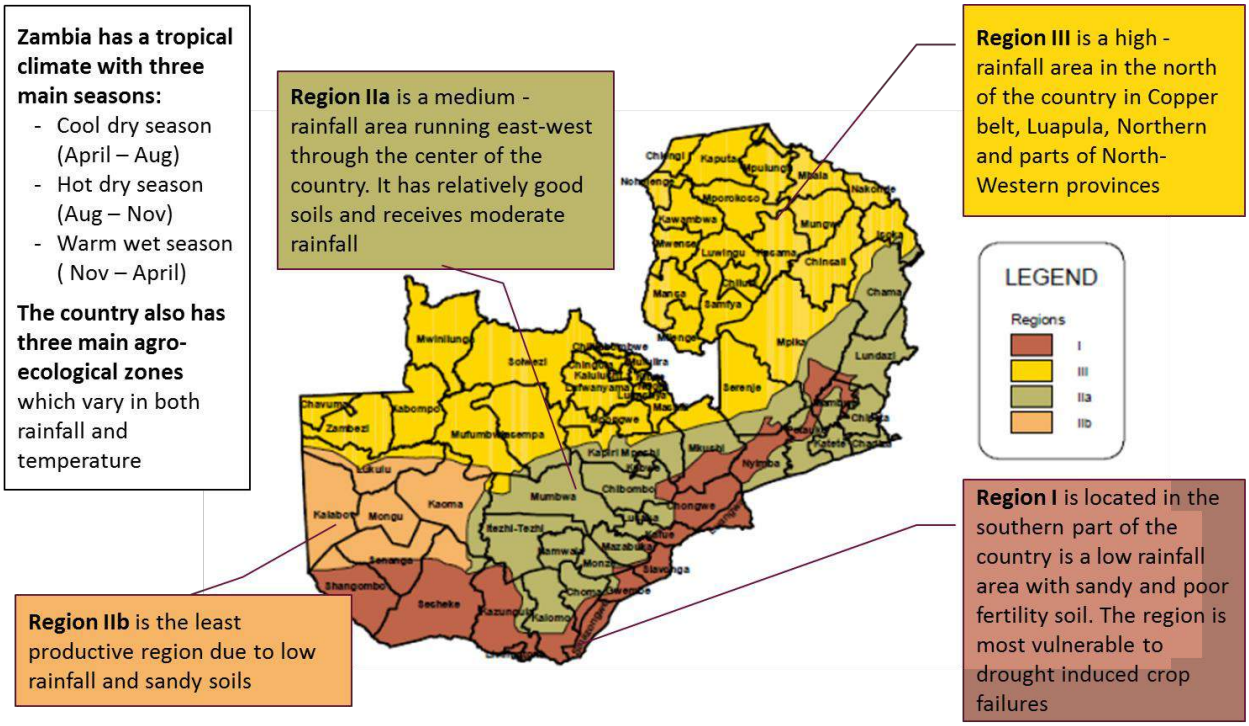
We look forward to engaging in the ecosystem moving ahead and continuing to communicate learning to ecosystem actors.

Zambian Agriculture and the Smallholder Farmer

Zambia has a population of about 16 million people and is divided into 10 provinces, with 3 main ecological zones. As of 2014, the GDP reached 27.07 billion USD and GDP per capita of USD 1,539.6. However, for the 1.5 million rural households, incomes are much lower, estimated at USD 800 earnings per person[43].

The map below shows the three agro-ecological zones in Zambia, which vary in vegetation, precipitation, soils, and altitude.[44]

Figure 17: Map of agro-ecological zones in Zambia



Smallholder farmers in Zambia grow a small set of crops (3 to 5), with majority of these being food and staple crops. Over 80% of all farming households grow maize, accounting for 51% of total food production by dollar value in 2012. This is followed by cassava (18%), vegetables (9%), soya beans (7%), groundnuts (5%), wheat (5%), and fruit (4%). Cash crop production value is limited to, and fairly evenly distributed between three crops: cotton (44% - cotton lint and seed), sugar cane (32%), and tobacco (24%).[45]

Value Chain Mapping

AFA has been designed as a deeply 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

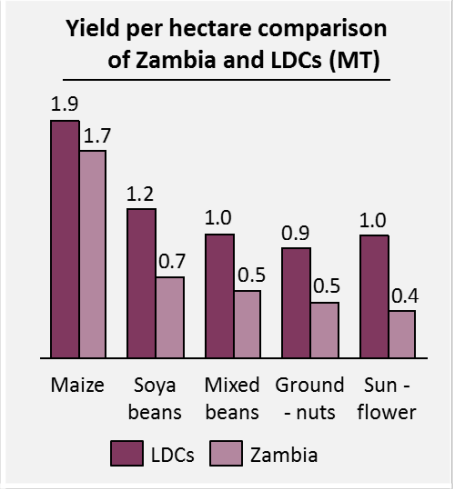
[43] Trade Economics: http://www.tradingeconomics.com/zambia/gdp-per-capita
[44] Soil Health Consortia: Integrated Soil Fertility Management in Zambia
[45] FAO Stat, 2012

understand where significant numbers of underserved SHF are engaged in order to 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 25 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.

Through our review, we found that maize and cassava are the main staple foods in Zambia, with SHF being the primary producers of both crops. Maize is grown by 82% of smallholder farmers, with production standing at ~2.9 million metric tons in 2012 and was followed closely by cassava production at ~1.1 million metric tons. At $390M, the value of maize production in 2012 was the highest of all crops followed by cassava at $135M. Sugar cane is the single largest cash crop by production volume in 2012 at 3.9 million metric tons followed by cotton at 86 thousand metric tons. Sugar cane is grown on large plantations while cotton is mostly grown by small holder farmers through outgrower schemes. The value of sugar cane production was $128M while that of cotton was $123M. On the other hand, livestock production accounts for 42% of Zambia's agriculture activity, and 5% of GDP; demand for meat is expected to triple by 2030, outpacing supply. Beef production in Zambia was worth $183M in 2012 while milk production was worth $27 million. 2012 egg production was worth $45M.

Agriculture in Zambia, like many other SSA countries is primarily rain-fed; as such, although production of most food crops has increased over time, the increase has been erratic due to high dependence on rainfall. We see lower average yields than other developing countries across all its major food crops. This includes maize despite fertilizer use in the maize value chain being over 50%. In fact, across most crops, traditional farming practices are still extensive; use of improved seed and production methods is relatively high for maize (55%) but drops off for other food crops such as sunflower (29%), groundnuts (18%) and soya bean (13%)[46]. Production fluctuations for crops also affect livestock due to the dependence on locally produced, rain fed fodder crops. In 2009 for example, poultry production dropped by 35% partly due to the high cost of feed.



Based on the following key criteria, we identified the four most promising focal value chains (VCs) for AFA to understand and support in depth over the life of the program, although program activities will not necessarily be limited to these VCs:

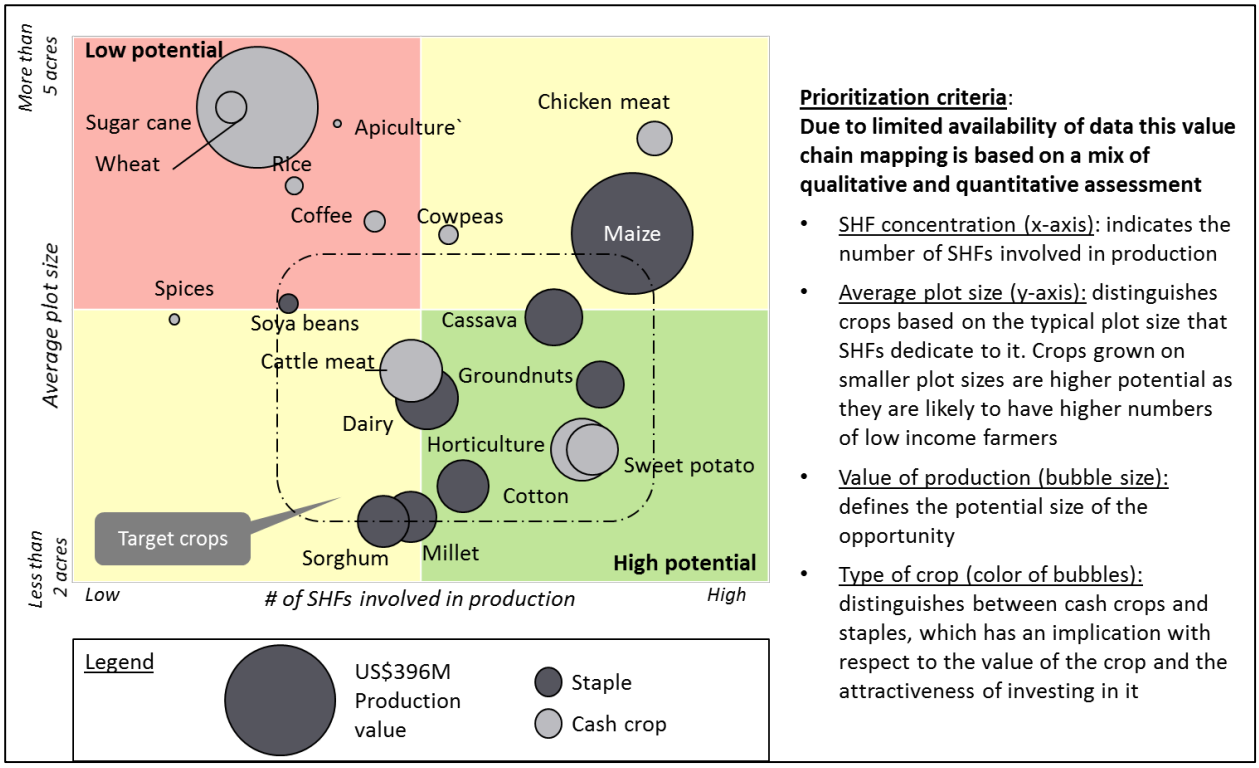
- ✓ Number of SHF, estimating populations living on less than $2.50 per day
- ✓ Role of women and youth in the value chain
- ✓ Level of aggregation in the value chain across buyers and farmer access points

[46] IAPRI Briefing on Zambian Agriculture January 14th, 2016

- ✓ Contribution to food security and nutrition
- ✓ Growth trends that would be indicative of the income potential of the VC

These criteria allowed us to shortlist from 25 initially prioritize VCs to 8, after which additional screening was done 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, the program selected cotton, tomatoes, dairy, and soya beans, with a secondary focus on orange maize and groundnuts due to the significant role played by women in these value chains.

Figure 18: Mapping to identify value chains with significant output value and smallholder participation



We found ***cotton*** to be a promising value chain for digital financial services in Zambia as it is highly structured, with large transaction volumes to the 600,000 SHFs involved in the value chain[47]. 95% of cotton producers are smallholder farmers. The Zambian cotton value chain is dominated by the out-grower model in which farmers are contracted to specific off-takers (ginneries) who provide subsidized inputs on credit in return for the farmers commitment to sell the crop at an agreed upon price. About ~350,000 are contracted to members of the Zambia Cotton Ginners' Association (ZCGA). The cotton value chain has two major outputs (cotton lint and cotton seed) and one by-product (cotton waste). More than 70% of the cotton lint that is produced in Zambia is exported to factories in South Africa and Switzerland for further processing into cloth and garments. Cotton seed is sold to oil seed processors for pressing into cotton seed oil and oil seed cake. Short fibers that are not suitable for further processing into export quality lint is sold domestically to furniture manufacturers for use as stuffing. The output of the initial lint clean-up process is resold to farmers as manure. There is virtually no direct selling of cotton crops to local or regional markets or aggregators by farmers as the out grower model effectively guarantees a market

[47] World Bank Report #124: The cotton sector in Zambia

for the farmers entire crop. Production volumes vary considerably from year to year but have been on an upward trajectory surpassing 86,000 MT in 2012.[48]

Figure 19: Summary of key findings on challenges for smallholder cotton farmers[49]

Input from field interviews

"None of us have bank accounts. We don't have enough to save plus all our money is constantly in circulation…
It is too expensive to go to a bank. It costs me 20 ZMW one way to Lusaka plus its a full day affair (6am-6pm) due to few buses coming to our village"

- Interview with a group of cotton farmers

Challenges identified	
Production	• Cotton yields are not optimal despite access to inputs provided on credit by cotton ginners. There is **significant variation in farm yields** from 0.4 MT/ha for the lowest quintile to 1.5 MT/ha for the highest quintile suggesting **heterogeneity in farmers access to and adoption of improved farming practices and sufficient inputs** • Low levels of mechanization limit the yield potential of current cotton production
Consumption smoothing	• **Lump sum payments for cotton leave farmers vulnerable to consumption shocks** during the January – March period when cotton income has been spent and staples like maize have not yet been harvested • **Lack of affordable credit mechanisms** make it difficult for farmers to borrow to finance ongoing consumption needs and mitigate income shocks
Climate change and yield	• **Changing weather patterns** are threatening crop yields and increasing the risk associated with buying inputs on credit as farmers have payouts deducted from already failing crops • **Lack of adequate access to crop insurance products** increases farmer vulnerability to income shocks
Enforcement and bargaining power	• **Lack of effective enforcement mechanisms** results in high levels of loss of input credit supplied by ginners (~20%) as farmers opt to side sell to non-subsidizing buyers that can afford to offer higher prices • **Coordination by ginners puts farmers at a disadvantage with regard to bargaining power** with the ginners as ginners can collude to depress prices offered to farmers. Previous attempts to collude have been thwarted by some ginners reneging on the commitment to offer a uniform price to all farmers

Another important value chain is ***tomatoes;*** there are ~500,000 SHFs cultivating tomatoes, covering every province in Zambia. Low capital intensity reduces entry barriers for women and youth – 17% of tomato growers are in female-headed households. Tomato is a highly unstructured value chain with over 80% of the produce being sold in open air markets. However the market is concentrated at the wholesale level with over 80% of produce passing through one of two large markets: Soweto Market in Lusaka and Main Masala Market in Ndola.[50] Major off-takers for tomatoes are the commodity buyers for large supermarket chains such as Shoprite and Spar. Food processors such as Freshpikt also off-take from aggregators and are considering developing out-grower schemes. Although a highly unstructured value chain, there is an opportunity to bring SHF into structured supply chain for large off-takers such Shoprite and Pick-n-Pay. However, this is dependent on ensuring that SHF can deliver consistently throughout the year.

[48] The Atlas of Economic Complexity
[49] AFA Zambia Ecosystem Study, Dalberg 2016; WB research paper #124
[50] Zambia agricultural census report 2000

Figure 20: Summary of key findings on challenges for smallholder tomato farmers[51]

Input from field interviews

""I have not sold any of the tomatoes I have harvested this time... The price in the market has dropped to almost half of what was being offered last month!"

"We used to have a water pump that we used to irrigate our vegetables but since the rains were short this year, the water has gone very low and the pump can't pull up the water any more... if we could pay for a pump in installments we would buy a new one"

Member of the Chikoko women's group in Kafue

Challenges identified in tomato	
Inputs	• **Lack of affordable credit mechanisms** make it difficult for farmers to borrow to finance labor saving technologies such as water pumps for irrigation • **Tomatoes are usually planted using recycled seed** which do not have as high a yield as commercial seed
Production	• **Manual cultivation limits production especially during the rainy season when labor is scarce** due to the need to cultivate other labor intensive staples such as maize and cassava • **Inability to produce consistently throughout the year** limits farmer capability to supply large off-takers like Spar and Shoprite on contract • **Lack of adequate access to crop insurance products** increases farmer vulnerability to income shocks due to poor harvests
Transport, storage & marketing	• **Infrastructure bottlenecks** due to poor road networks makes it difficult for buyers to reach smallholder farmers • **No storage option** for tomatoes, requiring immediate marketing after harvest • **Poor post-harvesting handling** and compacted transportation bruises tomatoes reducing their shelf life and market price
Price volatility	• Tomato prices vary widely through the year with **farmers often selling their produce at throw away prices to avoid spoilage** • **Lack of market information on prices in alternate markets** make it difficult for farmers to price arbitrage

Dairy has been prioritized as an important value chain for AFA in all three countries (Kenya, Tanzania, and Zambia). About 310,000 households keep cattle and produce 70% of milk in Zambia. It is a fairly structured value chain with an extensive network of milk aggregation points and a large processor (Parmalat). Dairy cooperatives manage milk collection centres for smallholder dairy producers, although a small number also provide value added services to farmers e.g. veterinary services, dairy equipment, animal feeds etc. The dairy industry in Zambia is relatively underdeveloped, and significant investment is needed to increase production and boost growth of the value chain. The dairy sector can grow through better extension services to improve animal health care, improved access to artificial insemination to rear better livestock breeds, and higher commercialization for smallholder dairy farmers.

[51] AFA Zambia Ecosystem Study, Dalberg 2016; WB research paper #124

Figure 21: Summary of key findings on challenges for smallholder dairy farmers[52]

Input from field interviews

"Inputs are very expensive – in the dry season I have to decide between feeding my cow and feeding the family"

- Interview with a dairy farmer

Challenges identified in dairy

Inputs	• **High costs of inputs** such as drugs, pasture seeds, dairy equipment • **Lack of quality feeds** and **overreliance on maize stover,** leading to poor milk production • **Unavailability of maize bran** for animal feeds due to exportation. Remaining maize bran is sold for very high prices, thus increasing production costs for farmers
Production	• **Suspicion of livestock improvement practices** among some farmers e.g. artificial insemination • **Lack of access to land** limits production of animal feed, as most of the land available is customary • **Seasonality in production** due to weather dependence for production of feeds • **Lack of high quality cattle breeds** due to high importation costs from overseas
Marketing and Processing	• **Long distances to milk collection centres** causing loss and deterioration of milk due to high temperatures • **Dominance of processers** who determine milk prices with no involvement from the Dairy Association of Zambia or farmers, and also withhold information about processing costs, • **Failure of upcoming processers** to collect milk regularly and make regular payments to SHFs
Financing	• Banks financing farmers offer h**igh interest rates or limited access to credit**

Lastly, ***soya beans,*** is a high priority value chain based its agronomic and nutritional attributes as well as income-generating potential for poorer farmers especially women: soya can be used to rejuvenate soils hence can be inter-cropped with cotton. It has high protein content (about 40%) and can improve nutritional standards of rural households. Growing demand of soya offers significant opportunity for smallholder farmers to improve their cash base. Despite the clear benefits of soya, SHF production remains low with only 15% of demand being supplied by the 133,000 SHFs in the value chain; this may be due to the perception that soybean markets are unreliable. Amongst SHFs producing soya, productivity is low due to poor farming practices and lack of access to high yielding soya seed. Zambia is a net exporter of soy, with 15% of supply coming from smallholder farmers. Soya is primarily exported to Zimbabwe (45%), Botswana (10%), and RSA (9%) – the rest of the export market is unknown.[53]

[52] AFA Zambia Ecosystem Study, Dalberg 2016; Agricultural Science Technology and Innovation System Case Study of the Zambian Dairy Industry 2009; Business Viability assessment study of smallholder dairy farming in Zambia 2014, Dalberg analysis based on value chain reports and field research

[53] TechnoServe: Southern Africa Soy Roadmap – Zambia value chain analysis

Figure 22: Summary of key findings on challenges for smallholder soya beans farmers[54]

Input from field interviews

""I keep one sack of soya beans for planting in the next season and sell the rest"

- Soya farmer (1) in Choma"

"I sell to the agro-dealer at the puma petrol station in Choma. He buys for WFP…I transport it to the road using my ox-cart and wait for a Canter (one ton truck) to pass by and take me to Choma"

– Soya farmer (2) in Choma

Challenges identified in soya beans	
Inputs	• **Limited availability of high yielding soya seed:** limited incentive for private investment in smallholder soya seed multiplication because SHFs prefer open pollinated varieties (OPVs), which can be recycled for up to five years with minimal yield loss. However, supplying recyclable seed is less profitable for suppliers • **Limited availability of commercial seed in general:** increased government maize purchases has pushed both commercial farmers and SHFs to soya production hence leading to seed shortages. Additionally, most of seed produced is sold to commercial farmers, leading to shortage of seeds for SHFs • **High cost of fertilizer** due to high cost of importation
Production	• **Low production** due to poor agronomic practices such as late planting, poor disease management, low use of yield-improving inputs (e.g., SHFs rarely use inoculum in soya bean production; ZARI is the sole producer of inoculum within Zambia), seed contamination etc. • **Low production by SHFs due to a perception that soya markets are unreliable / highly volatile**, despite offtakers indicating that there is a significant unmet need for soybean
Marketing	• **Limited access to high value markets:** farmers (due to cash flow constraints) would rather be paid immediately after harvest even though prices are low i.e., ~70% of total marketed volume are distress sales, with farmers selling during the first three months after harvest (May – July); SHFs do not produce a sufficient amount to justify transporting to potentially more remunerative markets in the district capital where buyers are willing to pay a premium on bulk purchases • **Distrust between farmers and traders:** farmer complain of rigged scales whereas traders complain that sacks are often loaded with sand and/or stones to increase weights and there's no enforced grading system in place. These systemic issues affect market prices, often to the disadvantage of the farmer • **Inadequate transport infrastructure:** poor feeder roads as well as high fuel and maintenance costs make it difficult for SHFs to sell their produce to high value markets
Govt. policies	• **Trade policy:** Zambia has tight and unpredictable controls on soy trade and issues import and export licenses very selective; as such, traders and processors are hesitant to develop export strategies. In addition, Zambia soy export are less competitive because supply cannot be guaranteed • **Palm oil import policy:** COMESA sanctioned duty-free palm oil importation to Zambia, thus driving down prices (and profit margins) of soy oil, as well as weakening demand for domestically produced soy oil • **Maize promotion policies:** the Ministry of Agriculture and Cooperatives has introduced policies such as providing subsidized fertilizer and seed, and paying above-market prices which promote maize production at the expense of soya beans and other crops
Financing	• **Farmers have difficulty securing long term loans at affordable rates** for basic mechanization which would improve productivity of SHFs • **Lack of awareness of insurance products** which would help farmers manage economic shocks in the event that the farmers loses their soya yield

In additional to the individual value chains, we also identified other opportunities, such as working with clusters of value chains with similar characteristics e.g., soya beans and cow peas often have the same offtakers. 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 would 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 other markets, as brokers often 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 HNI 3-2-1, Arifu, and Esoko.[55]

[54] AFA Zambia Ecosystem Study, Dalberg 2016; **IAPRI -** Analysis of the Soya Bean Value Chain in Zambia's Eastern Province; **IAPRI –** Challenged of Smallholder Soybean Production and Commercialization in Eastern Province of Zambia

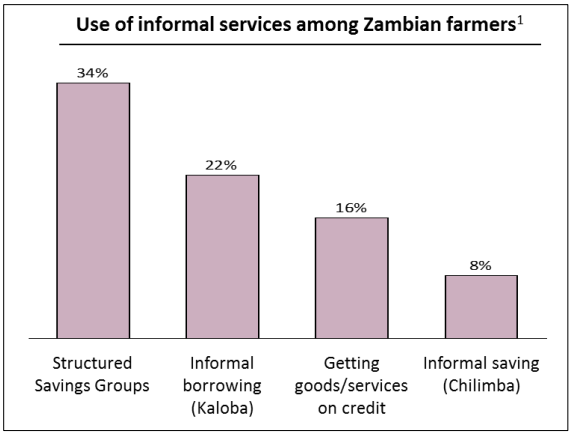
[55] HNI is an innovative mobile phone information service; Arifu is a leading African interactive learning platform for smallholder farmers, currently serving more than 150,000 SHF in Kenya and Tanzania, Esoko is a communication platform for businesses, government, NGOs and others to connect with farmers

There is an important trend toward commercialization of farming, including an increasing shift from food crops to cash crops by small scale farmers looking for better returns, and into sectors with less government regulation, such as horticulture farming (e.g., mangoes and avocadoes). In terms of farming methods, mechanization rates in agriculture are very low (10-15%), partly due to the nature of small scale holding. Farmers seeking to increase farm productivity need financing for new production methods such as irrigation and also need to address the rampant issues of fake seed and other inputs in the market.

Smallholder Profiles and Needs

In the course of our ecosystem assessment, we reviewed 15 recent studies (see Annex 1.2 for research summaries) with a range of focal areas, including SHF demographics, levels of financial inclusion etc. This review was purposed to answer 4 main questions:

1. ***What financial and non-financial services are available to farmers and how are they interacting with them?***

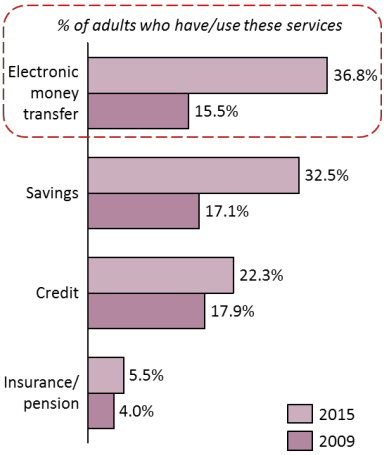


Similar to the general Zambian population, there has been an increase in farmers who are financially included. According to FinScope 2015, 51.3% of farmers are financially included, with 28.0% being formally included, and 34.4% informally included (16.9% use formal services only, 23.3% use informal services only, while 11.1% use both formal and informal services)[56]. Use of formal services comprises of both bank services and non-bank formal services such as micro-finance service providers, SACCOs, insurance companies, capital markets, mobile money services. Mobile money use is very low among farmers (5% - FinScope 2015). Majority of farmers use informal services use Chilimba (informal rotating savings schemes), structured savings groups, and/or Kaloba (informal credit providers) to access financial products. Zambian farmers interact with a network of financial services and providers. The most important financial services they utilize are electronic money transfers services and savings[57]. While mobile money had led to the rise in use of formal financial service providers (FSP), informal FSPs and friends / family still remain the dominant source of financing for rural Zambians.

[56] FinScope 2015
[57] FinScope Zambia 2015

Figure 23: Financial services used by Zambian farmers

		Financial Service Providers			
		Self	**Friends / family**	**Informal FSP**	**Formal FSP**
Financial tools	**Savings**	Home savings	Holding money for each other	Savings group / chilimba	Bank account; mobile money wallet
	Loans	N/A	Interest-free loan from friend/ family	Moneylender	Installment loan
	Insurance	Self-insurance through owns savings	Gift from social networks to cover an emergency	Burial fund from the community, informal group	Life insurance
	Transactions (remittances/ payments)	N/A	Cash gift through remittance	Money transfer through local buses	Mobile money transfer



In addition to financial services (both digital and non-digital), several sources of information are available to farmers digitally, although data on their effectiveness is unavailable. When it comes to these services, farmers primarily get agricultural information through traditional channels i.e., extension officers, radio, television and print media. However, there is increasing interest and involvement in disseminating information through mobile phones and other ICT outlets e.g., ZNFU 4455. These platforms are used to disseminate farming tips as well as information on market pricing. While farmer subscription to information services exist, few use it regularly and thus forget how to use the system nor derive meaningful utility from the services. The figure below is a summary of the platforms available in Zambia.

Figure 24: Sources of information available to Zambian farmers

	Digital Platform	Information Offered
Government & Public Sector	**National Agricultural Information Services**	Internet platform where farmers send questions on agriculture and receive answers on their mobile phones. Provided by Airtel
	Zambia Agricultural Research Institute	Improve communication between research institutions and farmers and between researchers and subject-matter experts
	AIMS	Agricultural Information Management System (AIMS) that provides storage and access to all types of agricultural information. Developed by TTC Mobile
	ZNFU 4455	Offers weekly prices for commodities obtained from over 100 traders & processors nationwide and available for all 72 districts. Provided by Airtel
	National Livestock Epidemiology and Information Centre	Digital Pen Technology (DPT) to improve real time reporting especially to veterinary camps in remote areas
NGOs	**Macha Works**	Farmers grow and market sunflower and jatropha using information from the internet
	CASPP, FISRI	Conservation Agriculture Scaling up Productivity and Production (CASPP) and the Farmer Input Support Response Initiative (FISRI) to improve efficiency in the distribution process
	iDE LimaLinks	A mobile phone point of sale (POS) and inventory control app that provides nearly 'live' horticultural market price data to farmers in Zambia
Private	**Zamace**	Certification of storage sites (warehouses), issuance of warehouse receipts, commodity exchange and oversight in the storage management and management of a market information system.

2. What are the emerging profiles of smallholder farmers in Zambia?

Through this literature review and interviews with various stakeholders, we identified, as earlier mentioned, that SHF in Zambia tend to be divided into three segments: subsistence, vulnerable-but-viable, and emergent SHFs. However, to really understand the profile of these farmers and to inform the design of our interventions, AFA engaged Bankable Frontier Associates (BFA) to further assess FinScope data to get a more nuanced look into smallholder farmers based on socio-demographics patterns within the FinScope data. The figure below is a snapshot of the four segments of smallholder farmers that we see Zambia[58].

Figure 25: Segmentation of SHF in Zambia based on data from FinScope 2015[59]

	Traditional male-headed households (n=356)	Struggling families (n=369)	Rising 30s (n=298)	Market gardeners (n=618)
Demographics	**Demographics** • 100% male headed household • Similar demographics to the struggling families, except relatively smaller family size (average of 4.9)	**Demographics:** • Very poor – PPI score of 1.1 i.e., poorest across all segments • Large households (average family size of 9)	• Youngest segment (average age of 30 years) • Largest land size (~8.4 acres) • Slightly better off than other segments – PPI score of 2.2 • Better educated	• Primarily female (72%) • Highly unlikely to keep livestock (only 2% do) • Smallest land size (~5.2 acres)
Geographic location	• Primarily found in rural areas (100%) • Majority found in Eastern Province (40%)	• Primarily found in rural areas (99%) • Evenly distributed across all provinces but less likely to be found in Lusaka and Western Provinces (11% and 16%, respectively)	• Primarily found in rural areas (89%) • Majority found in Lusaka (38%)	• Primarily found near to major cities (53% urban) • Majority found in Luapula (41%), Southern (41%), Western (49%)
Level of access to financial services	• Over half totally excluded from formal and informal financial services (51%)	• Over half totally excluded from formal and informal financial services (52%)	• ~40% are using formal financial services • Most likely to have received remittances • Most likely to be within an hour of financial access points, but still majority are more than an hour from services	• ~75% already use formal financial services • Most ikely to be within an hour of financial access points, but still majority are more than an hour from services

Development of DFS (including product design, marketing, and delivery) should be specifically targeted and adapted to the different segments in order to be relevant to farmers. For example, products and services for "rising 30s" farmers would need to be structured very differently from products for "struggling families", given different levels of education, exposure to existing financial products, proximity to financial access points etc.

3. What are the barriers to farmer uptake of financial services?

The low uptake of formal financial services among farmers is caused by both demand and supply side challenges. On the demand side, uptake is limited by several factors: (i) low income was the most cited factor for not utilizing formal financial services – farmers claimed to have insufficient funds to warrant using the service as the reason for not using formal financial services; (ii) lack of awareness: farmers also reported not knowing or understanding how the service works or the benefits of using formal financial

[58] NOTE: segment sizes may not be nationally representative due to selection bias: the total sample size for FinScope was small (n = 8,570) and only 22% of the respondents relied on farming as the main source of income. Segment sizes are directional/indicative

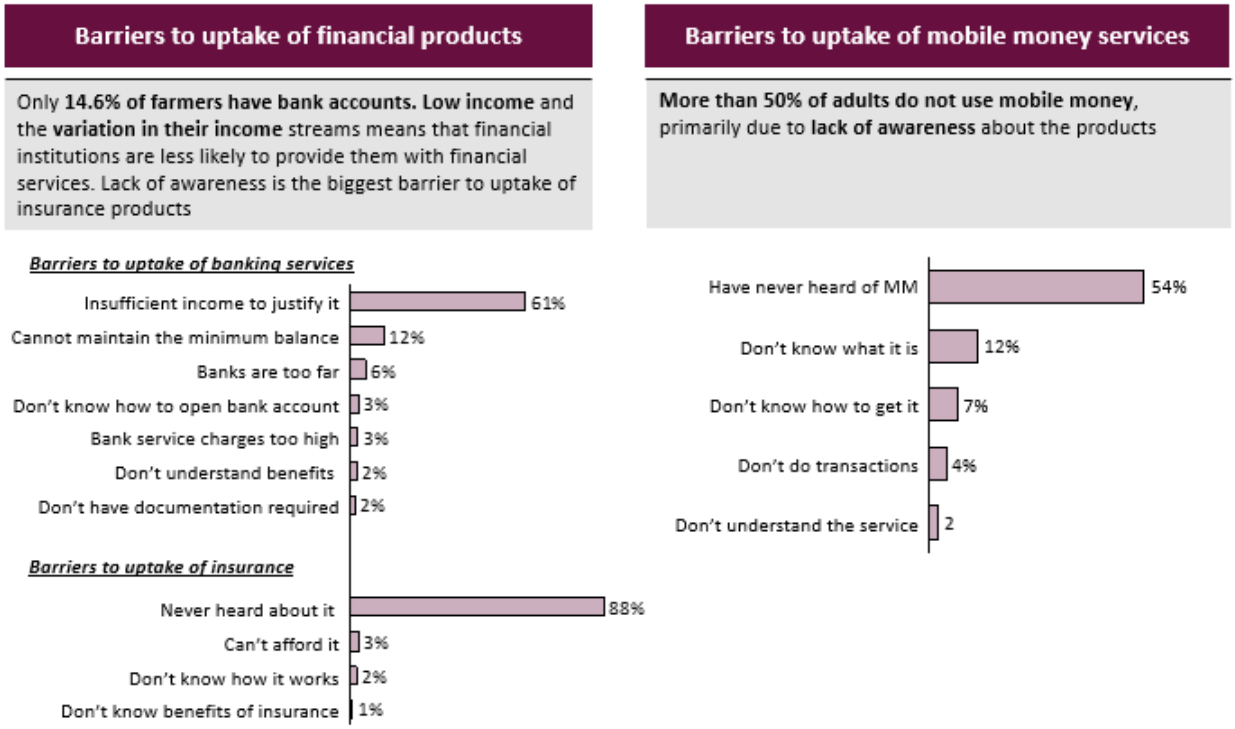
[59] Analysis done by BFA for the AgriFin Accelerate Program, November 2016

services – for example, 86.9% of men and 89.6% of women report never having heard of insurance[60]; (iii) when it comes to mobile money, farmers cite having unreliable phone models and lacking power to charge their phones as one of the reasons for not using mobile money, resulting in them easily forgetting how to access information and utilize the service; (iv) farmers also complain of information overload (too much advertisements from providers[2]), hence they have little to no interest in products offered digitally; (v) lastly, socio-cultural limitations inhibits uptake of products - apart from limited knowledge about financial services, women smallholder farmers also face additional challenges as they may have less decision-making power over finances due to sociocultural factors. More women than men also lack access to the actual handsets which may further limit their access to and use of mobile money[61]

On the supply side, two main issues emerged as limiting uptake of financial services. (i) poorly-designed products: citing high risks involved in lending to farmers, banks often do not offer products which are suitable for smallholder farmers who have variable harvest outputs and often do not have collateral. Loans offered generally have high interest rates (lending rates on personal loan facilities range from as low as 34% to as high as 48% among some commercial banks[62]); (ii) poor infrastructure: financial institutions refrain from providing services to rural areas due to high operational costs and low investment opportunities, driven by small-sized and infrequent transactions. Financial services often remain inaccessible to many due to perceptions about their availability. For example, FinScope reports 75% of adults from rural areas felt that they could not easily access financial services or did not even know their location. Although mobile penetration rates are high and digital information platforms exist, use of mobile phones for financial and non-financial services remains low, with farmers citing poor connectivity and inadequate agent networks as key factor that limits propensity to use digital financial services. In addition, the rate of smartphone penetration is low (only 13.5% of individuals with mobile phones, have smartphones[63]), thus limiting the potential to test for more sophisticated solutions as we see in other African markets like Kenya, Tanzania, Ghana etc.

[60] FinScope 2015
[61] FinScope Women Smallholder Farmers 2016
[62] http://www.manic.co.zm/banks-warn-higher-interest-rates/
[63] ZICTA: SURVEY ON ACCESS AND USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGY BY HOUSEHOLDS AND INDIVIDUALS IN ZAMBIA, 2015

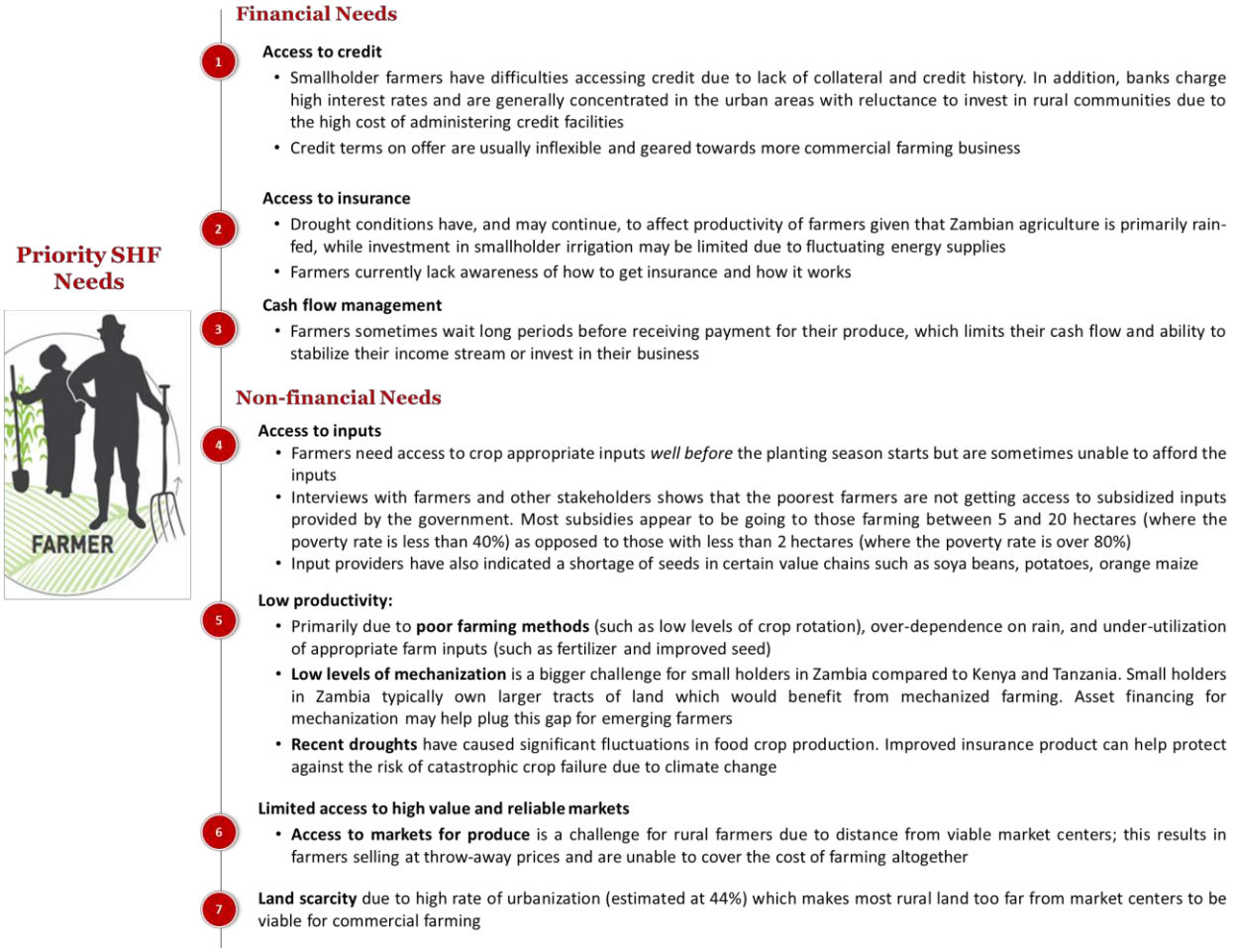
Figure 26: Barriers to uptake of financial services



4. What are farmers stated needs for financial and non-financial services?

Desk review of existing literature on SHF was complemented by a series of focus group discussions with farmers and farmer support organizations in targeted value chains. The focus group discussions revealed seven key unmet needs faced by Zambian smallholders. These challenges cut across the entire agriculture value chain and are highlighted in the figure below:

Figure 27: Smallholder farmers' needs



Women smallholders

According to IAPRI, 78% of Zambian women are engaged in agriculture compared to 69% of men[64]. Although women contribute as much as men to farming (50 -70% of labor force[65]), they earn less (about 8% less than men) and control a minority share of proceeds from agriculture and are less likely to be financially included. FinScope 2015 reports that women farmers and female-headed households have the lowest financial outcomes and financial inclusion rates. In fact, many women's financial lives are determined by their male family members, although direct control would result in better and greater investment in their families. Women farmers who access credit for their business through using land titles as collateral or otherwise and invest in their business are more successful than their counterparts who do not[66].

[64] IAPRI, Improved Agricultural Technology Adoption in Zambia: Are Women Farmers Being Left Behind?, March 2016
[65] IAPRI, Gender Control and Labor Input: Who Controls the Proceeds from Staple Crop Production among Zambian Farmers?, September 2012
[66] FinScope Focus Paper 2: Women Smallholder Farmers: Managing their Financial Lives, January 2016

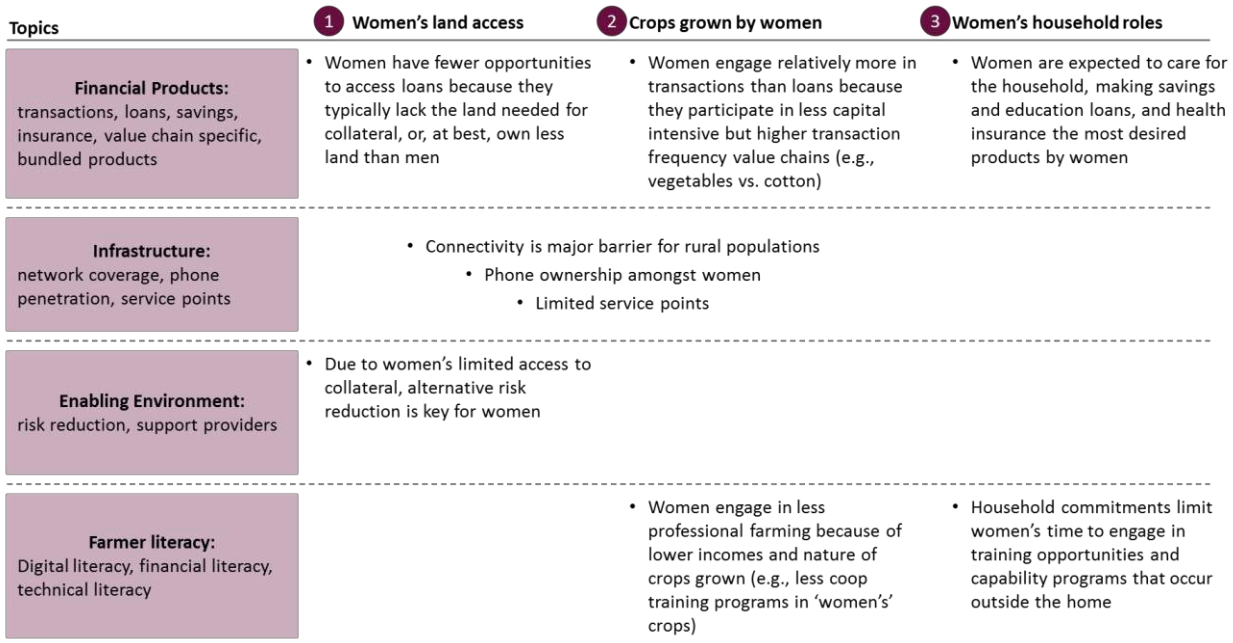
Figure 28: Key statistics on women smallholder farmers from FinScope 2015

Women smallholder farmers primarily use savings and credit, mostly from informal sources, to manage their cash flow and manage risk. Women farmers save in three ways: over one third of women save cash at home (39.2%), a lower percentage buy inputs in advance (11.5%), and about 10% of women give money to a family member for safe keeping (FinScope 2015). To mitigate risk, women farmers either purchase assets (livestock) or borrow through savings groups[67]. Use of mobile phone services is also lowest amongst women farmers (3.8% vs. male farmers at 8.7% and non-farming women at 13.2%)[68].

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.[69] 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.[70] Such cultural and behavioral issues must be addressed if women SHF are to benefit from advances in DFS in Zambia – this is also a core focus of the AFA Farmer Capability Lab. The following table sets out key challenges faced by women farmers in Zambia, linked to specific types of financial products, infrastructure barriers and the enabling, environment. Our research shows that three main factors affect how rural women access finance: Land access, crops grown by women, and household roles.

[67] FinScope Focus Paper 2: Women Smallholder Farmers: Managing their Financial Lives, January 2016
[68] FinScope Focus Paper 2: Women Smallholder Farmers: Managing their Financial Loves, January 2016
[69] GSMA, "Women in Agriculture: A Toolkit for Mobile Services Practitioners", May 2014.
[70] Ibid.

Figure 29: Challenges for women smallholders in Zambia



Youth smallholders

Like most countries in sub-Saharan Africa, Zambia has a disproportionately young population, where about 75% of the population is below the age of 30[71]. However, despite the high unemployment rate, there is very minimal participation in agriculture by this cohort: 35% of youth between the ages of 19-24 are employed with 25% of those being self-employed, mostly in the agriculture sector - 21% are involved in crop farming with another 20% being involved in livestock farming and fisheries[72]. The low participation of youth in agriculture is attributed to the strenuous labor demands and limited income given the seasonal nature of the agriculture.

Agriculture in Zambia has untapped potential to create jobs for youth. To attract young people, agriculture will need to be more dynamic and present real opportunity for income and growth. Youth currently reject agriculture due to a lack of technological advancement in farming methods, limited resources – particularly lack of access to financing to supporting farming activities, and lack of incentives to change their mindsets regarding agriculture – majority still look at farming as a rural activity primarily for the older generations. Programs such as the Climate Smart Agriculture and Entrepreneurship in Young Farmers Clubs Project try to address these issues. The program is a two and half year Technical Centre for Agricultural and Rural Co-operation (CTA) funded project being implemented by DAPP[73] in Chibombo district in the Central Province of Zambia. The overall objective of the project is to contribute to the advancement of youth involvement in agricultural entrepreneurship with the support of Information and Communication Technologies to promote climate-resilient agro-food value chains[74]. Another program targeting youth farmers in Zambia is the Zambian – German Agricultural Knowledge and Training Centre

[71] CIA World Fact Book
[72] International Youth Foundation – YouthMap Zambia: A Cross-Sector Analysis of Youth in Zambia
[73] Development Aid from People to People, a welfare organization that works with development partners and the government of Zambia to implement long term development projects
[74] http://www.dappzambia.org/projects/climate-smart-agriculture-and-entrepreneurship-in-young-farmers-clubs-project

(AKTC) which is focused on training young people in order to bolster and appreciation of the agricultural sector. These trainings are conducted targeted agricultural students from the National Resources Development College (NRDC) in Lusaka and the Zambia College of Agriculture in Mpika[75]. These programs are however few and far between.

Our ecosystem study revealed large gaps in existing data on Zambian youth farmers, particularly regarding agricultural activities. However, based on the interviews conducted through focus group discussions we identified the following key constraints for youth SHF:

Figure 30: Key constraints facing youth SHF

Constraint	Description
Education and vocational training	• 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	• 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	• 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	• There are three major barriers that youth encounter when trying to access and use formal financial services: 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	• 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	• 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

Not all constraints listed above can be overcome using technology. However, 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 in Kenya and Tanzania[76]. 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

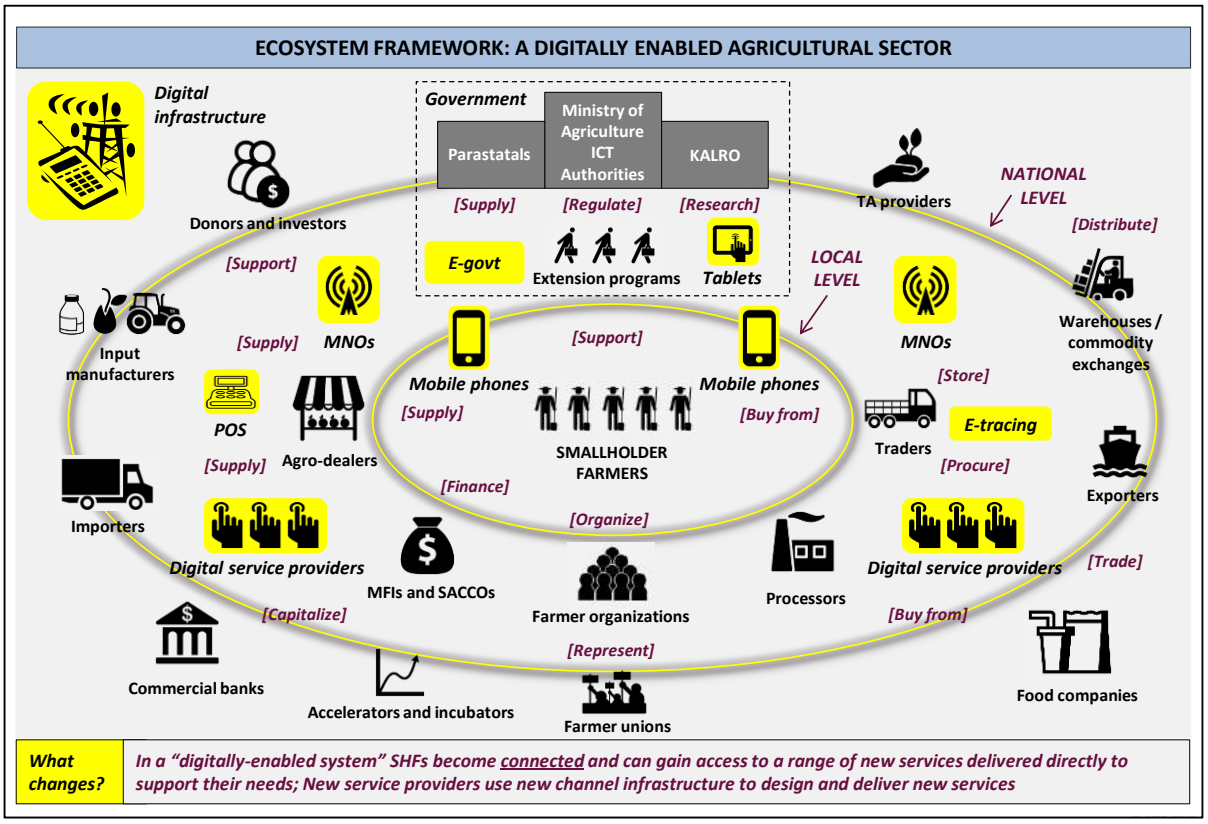
[75] http://www.aktczambia.com/wp-content/uploads/2016/12/Agricultural-Youth-Empowerment-Trainings-.pdf
[76] http://www.shambashapeup.com/

leverage technology and bring SHF, particularly tech-enabled youth, into a more productive level of farming. In addition to addressing the aforementioned issues, it will be important to increase young people's role in agri-business, agro-processing, and marketing to expand their economic opportunities and diversify their skills beyond primary production.

Ecosystem Assessment

In conducting the ecosystem assessment, AFA 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 AFA 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 31: Ecosystem Framework for a Digitally Enabled Agricultural Sector

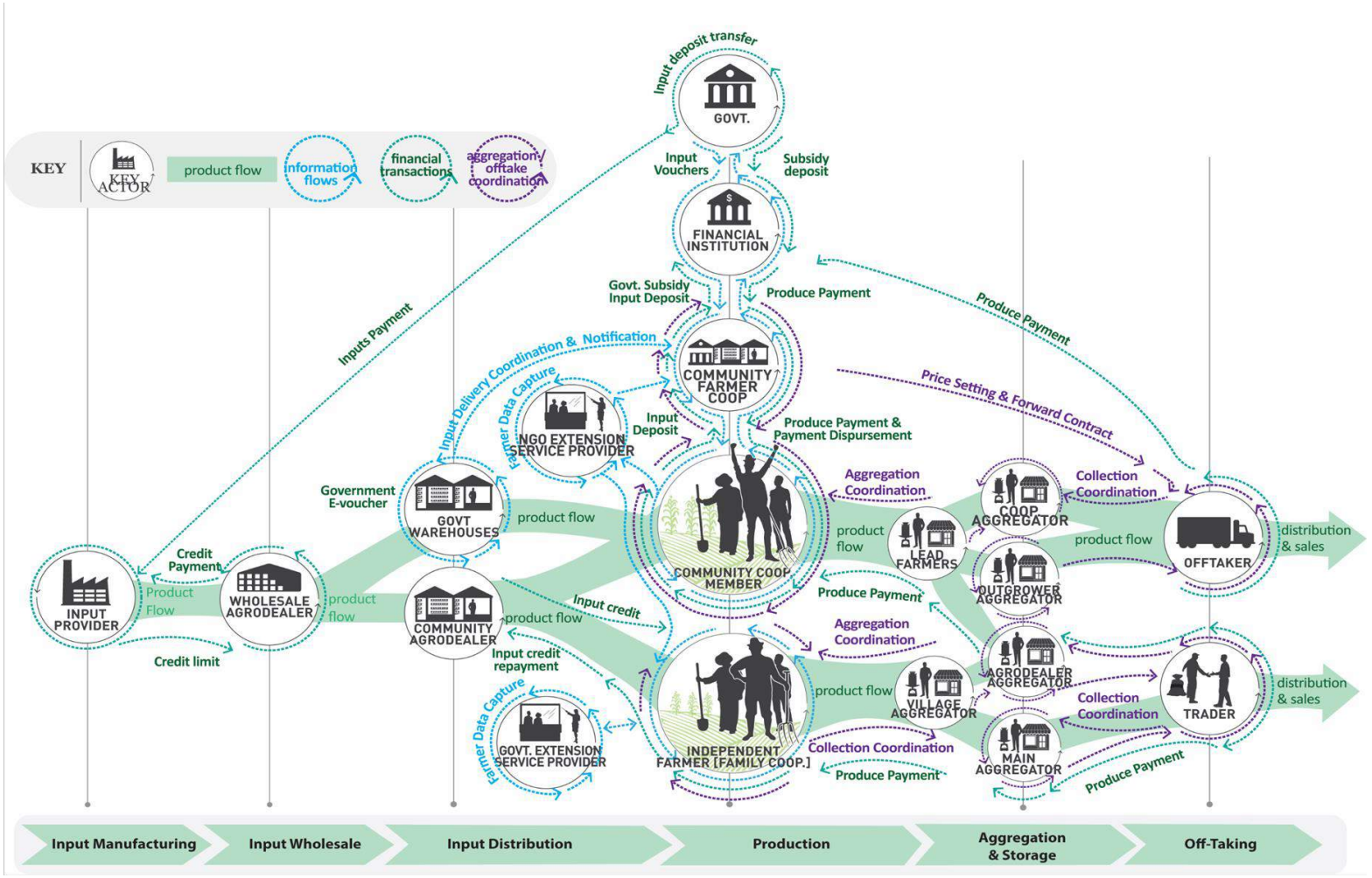


High functioning ecosystems drive efficiency and increase active use of services. For SHFs, ecosystems of providers include buyers, suppliers, farmer unions, banks, insurers, MNOs, government and a diverse range of other players. These ecosystems are often fragmented and few actors are technology enabled. 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.

Our approach as AFA is to identify and work as an innovation partner with other ecosystem actors committed to expanding delivery of services, particularly financial services, to smallholders on digital channels. To identify the right partners to work with, we mapped out the interactions smallholder farmers

in Zambia have. In addition to this mapping, the Dalberg and AFA teams also conducted 35 interviews with external stakeholders to understand the nature and maturity of the ecosystem for digitally-enabled services for SHF, 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. Our assessment showed that SHF interact with a broad range of actors, including but not limited to input providers, FCL, MNOs, offtakers, financiers, government etc. The figure below is illustrative of the smallholder farmers' ecosystem, key actors they interact with, which then can become potential partners and points of intervention to start addressing some of the challenges discussed earlier

Figure 32: SHF ecosystem



Examples:	- Yara - Syngenta - Zasaka - Zambia Fertilizers - Amiran Ltd.	- Community agrodealers	- Government, through FISP program	- Independent SHF - SHF in outgrower schemes - Contracted SHF	- Agrodealers - Traders - Cotton ginners - Zasaka	- AFGRI - CHC - Seba Foods - WFP

In addition to value chain actors, the agriculture sector in Zambia has various stakeholders engaged in policy-making, trading, financing, capacity building, and research. These include:

Figure 33: Stakeholders in the agriculture sector in Zambia

	Key Stakeholders	Role
Governance	Ministry of Agriculture and Livestock; Ministry of the Mines, Energy and Water development; Ministry of Lands, Natural Resources and Environmental protection	• Ministry of Agriculture and Livestock regulates and provides resources to, and promotes agriculture; Ministry of the Mines, Energy and Water development and the Ministry of Lands, Natural Resources and Environmental protection manages and conserves resources for socio-economic development.
Market Actors	Zambia National Farmers Union; KAMANO SEED; GRAIN TRADERS Association of Zambia; WFP	• These market actors provide the agricultural sector with inputs, access to domestic and international markets, as well as act as middle men, aggregating output for markets.
Financial Actors	THE WORLD BANK; Investrust Bank Plc; BARCLAYS; FNB First National Bank; VisionFund ZAMBIA; FINCA; zanaco	• Financial actors in Zambia's agricultural sector are varied, including local and international banks, multilateral development banks, microfinance institutions, private firms, and national financial institutions.
Capacity Building	MUSIKA; CRS CATHOLIC RELIEF SERVICES; fsdZambia Expanding Financial Inclusion; IFDC	• Various government bodies, non-profit, and private sector groups focus on capacity building. The majority of actors choose a specific region or crop to focus on. In some cases, this is advantageous; in others, it leads to a fractured and weakened landscape as different entities duplicate efforts.
Research Community	IAPRI; Central Veterinary Research Station; BU Center for Global Health & Development; Central Fisheries Research Institute	• Research organizations have operations in Zambia, many funded by international funding. Like capacity builders, research organizations tend to focus on a specific aspect of agriculture
Donors and Foundations	EUROPEAN COMMISSION; The MasterCard Foundation; IFAD; Sida; Norad	• Multiple donors and foundations are supporting the agriculture sector in Zambia. See Annex 1. 7 for full list

There are several programs in Zambia that may complement (or potentially overlap with) AFA's proposed activities. The figure below captures some of these programs but the list is not exhaustive – see Annex 1.8 for a broader list.

	Program	Funder	Implementing Partner	Duration	Amount (type)	Activities
MCF-Funded	Smallholder Development Unit	MCF	AgDevCo	2016 - 2021	$15.4m (grant)	• Smallholder Development Unit (SDU) – an initiative to boost the incomes of SHFs in 7 countries (Ghana, Malawi, Mozambique, Senegal, Tanzania, Uganda, and Zambia) • SDU will develop out grower schemes targeting 500,000 farmers, half being women under 35
	Mobile Money for the Poor	MCF, BMGF, DFAT, SIDA	UNCDF	2014-2019	$25m (grant)	• Funds the Mobile Money for the Poor (MM4P) program to catalyze development and use of to digital financial services in Zambia, Benin and Senegal; aims to reach 3m low-income clients in the three countries
Other	Smallholder Productivity Promotion Program	IFAD, Finland	Ministry of Ag.	2011 - 2018	$24.8 (grant & loan)	• Increase production and productivity, and sales of smallholder farmers; increase sustainable smallholder productivity, and create enabling environment for productivity growth • Targets 60,000 SHFs
	Smallholder Agribusiness Promotion Program	IFAD, Sweden	Ministry of Ag.	2011 - 2018	$20.21 (grant & loan)	• Increase diversification of production and improve market operations • Targets 24,000 SHFs
	Rural and Agriculture Finance	DFID	fsdZambia	2016 – n/a	Unknown	• In its current strategy, FSD Zambia has identified opportunities in rural and agriculture finance wants to act as a catalyst to effect market change in a sustainable way through investment in infrastructure, coordination, capacity building, advocacy, innovation and information support functions
	Production, Finance & Technology Project (PROFIT+)	USAID	ACDI/VOCA	2012 - 2016	$24m (grant)	• Increase agricultural productivity and expand markets and trade in maize, oilseeds, and legumes with special emphasis on women • Targets to reach 200,000 SHFs

Enabling Environment

The formal financial sector in Zambia is still relatively small and comprises of 19 commercial banks which are primarily foreign-owned (6 foreign owned, 2 owned by local private investors, and 1 jointly owned by the Zambian Government and the Indian Government). The regulatory environment established by the Bank of Zambia (BoZ) is seen as being neither prohibitive nor aggressively supportive of digital financial services. Given the early stage of DFS in Zambia, the BoZ is regulating the space carefully to allow innovation and has only recently started to fix more detailed sets of regulations.

Two out of the three MNOs and two independent operators are active in this space:

- **Airtel:** Airtel has 4.5m customers and 40.8% market share. At 3.1m accounts, it has the most mobile money accounts in Zambia. However, less 10% of these are active (i.e., less than 300,000 accounts)[77]
- **MTN:** with 4.8m customers (~43.6% market share), MTN is the largest MNO in Zambia. However, it only has ~800,000 registered mobile money accounts of which ~7% are active (i.e., ~56,000 accounts)[78]
- **SwiftCash:** this is ZamPost's money transfer service. Whereas it used to be the leading money transfer service, Zoona and MNOs have reduced SwiftCash's DFS market share to 28% (c. 2015). Despite its loss of market share, SwiftCash it still more popular and trusted than mobile money. SwiftCash has a strong geographic distribution in Zambia, given ZamPost's robust post office network with at least one post office in every district
- **Zoona:** an independent operator that offers traditional over-the-counter mobile money service. A money sender/receiver uses an agent's phone to facilitate the transaction. It is the most frequently used DFS in Zambia. Specifically in agriculture, Zoona has an e-voucher platform that allows farmers to receive digital vouchers in place of hard cash. These vouchers allow for digital savings as well as receiving input subsidies. Farmers can use the e-vouchers to prepay for inputs at a discounted price and receive updates on input delivery

Because this is a nascent market, aggregators such as Cellulant, Zynle, and Segovia, will play an important role in driving market growth by offering cross-network integrations and connecting customers' mobile wallets across multiple DFS providers (MNOs and banks).

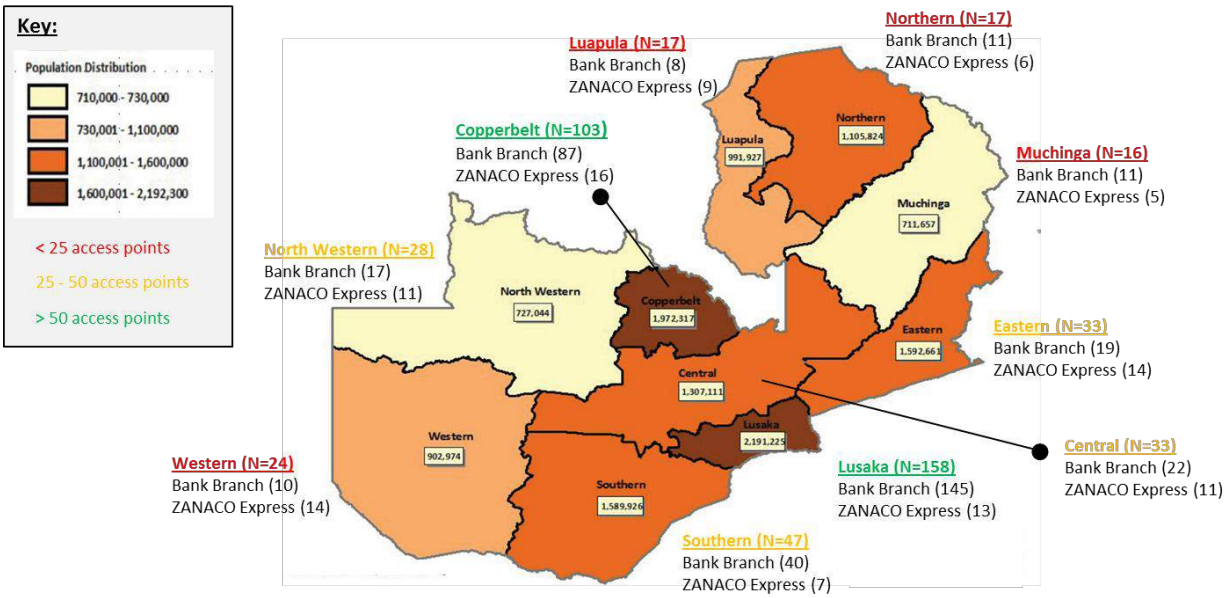
While commercial banks are slightly behind the MNOs in terms of developing DFS and relevant agent networks, several of them are engaging in this space to support rollout of their digital financial services. Out of the 19 commercial banks in Zambia, the following stand out as having an agriculture focus, relatively strong distribution networks, and products relevant to SHFs[79]:

- **BancABC** provides the eVoucher VISA cards through which 218,000 farmers got their FISP subsidies in 2016. They anticipate scaling to 500,000 farmers. Currently the bank has 25 branches and 20 ATMs
- **FNB** finances smallholder farmers through partnerships with off-takers. They also have a wallet that allows bulk payments to farmers and cardless ATM withdrawals. FNB has distributed POS devices to agro-dealers to allow farmers to use their FISP eVoucher VISA cards. Currently the bank has 22 branches and 79 ATMs

[77] Zambia Information and Communications Technology Authority; InfoDev Mobile at the Base of the Pyramid: Zambia 2014
[78] Zambia Information and Communications Technology Authority; InfoDev Mobile at the Base of the Pyramid: Zambia 2014
[79] AFA Zambia Ecosystem Study, Dalberg 2016 – Information from service provider websites

- **Indo-Zambia bank** offers agriculture financing for farm mechanization and inputs. They finance up to 80% of the asset / input invoiced amount. Currently the bank has 28 branches and 40 ATMs
- **Investrust** offers an Invest Farmer account for farmers with an opening balance of ZMW 10 and no maintenance fees. It has an agent network and an accompanying Eaze account, the cheapest bank account in the market. Investrust currently have 30 branches, 58 ATMs, and 550 agents although only 50% are active
- **Stanbic** offers agro-input financing and financing for other sections of the value chain e.g., transportation and food processing. It offers money transfer services through Shoprite (at 21 locations in Zambia) and has distributed POS devices to agro-dealers to allow farmers to use their FISP eVoucher VISA cards. Currently Stanbic has 24 branches and 82 ATMs
- **Standard Chartered** has a Commodity Traders & Agribusiness arm specializing in financing solutions for agriculture and other sectors. It has a Straight2Bank wallet that allows bulk payments to MTN and Airtel wallets. Currently the bank has 21 branches and 47 ATMs
- **Zanaco**, a pioneer of agency banking in Zambia, has a rapidly growing customer base, and also has the most robust agency network. It also has a mobile banking account (Xapit) designed for the unbanked population. The bank offers a range of financial solutions for agri-corporates, emergent, commercial and small scale farmers i.e., Loan-a-cow asset financing product bundled with insurance and Lima credit scheme, an input and asset financing product. Cultiv8 was a mobile banking account that specifically targets farmers, available through Airtel. It is no longer active. At 1M customers, it has the most customers of any bank. Zanaco currently has 66 branches, 197 ATMs, and 533 active agents

Figure 34: Distribution of bank branches in Zambia[80]



In addition to commercial banks, Zambia has a relatively robust network of non-bank institutions* that offer financial and non-financial services to Zambians. This include 37 MFIs, 27 insurance service

[80] Bank of Zambia, FSDP Progress Report, 2015; Bank of Zambia, Financial Systems Supervision Annual report, 2014; 2010 Census Zambia map

providers, 1 post office operator and 1 savings and credit bank. Below is a sample of those that have a strong agriculture focus or a significant SHF reach[81].

Figure 35: Sample of non-bank institutions with a strong agriculture focus

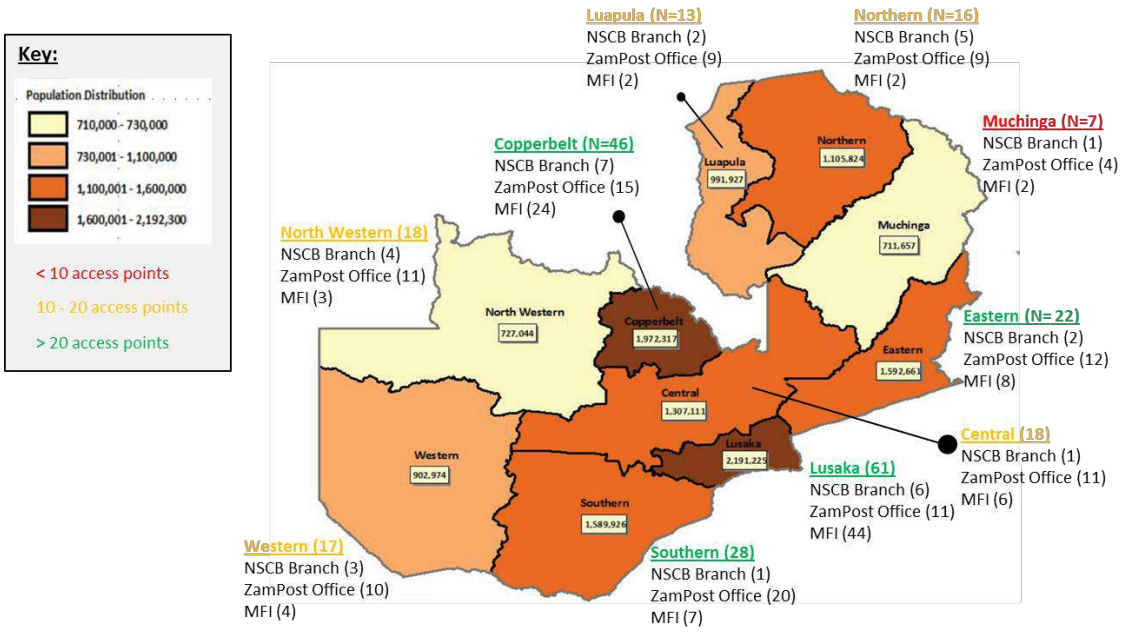
	Institution	Summary
Savings & Credit	NATSAVE NATIONAL SAVINGS AND CREDIT BANK	A government-owned entity with a mandate to reach the marginalized population. It has geographic representation in all the provinces in Zambia through a network of 32 branches. Moreover, it has financial products that target SHFs.
Postal	ZAMBIA POSTAL SERVICES CORPORATION	The government owned and operated postal service has 146 branches throughout Zambia with at least one office in every district. On top of postal services, it also offers money transfer and microfinance services
MFIs	CETZAM Financial Services PLC	It is an affiliate of Opportunity International (global MFI network). It has 8 branches in 8 districts and an additional satellite offices in 13 districts. They offer agricultural loans bundled with life insurance
	VisionFund INTERNATIONAL	As part of World Vision's network of 40 global MFIs, VFZ has a network of 12 branches in 12 districts in Zambia. They offer loans for dairy, irrigated horticulture and seasonal crops
	FINCA	A global MFI with 14 branches in Zambia. They offer individual and group loan, savings and insurance products. They have recently partnered with FirstAccess to use alternative data to credit score prospective lenders
	MBT	This is a non-bank financial institution that targets vulnerable populations, particularly women. It has 12 branches in 7 provinces and has several credit products targeting groups, women and farmers
Insurance	FOCUS	Focus has weather-indexed and livestock insurance products that target farmers throughout Zambia.
	MAYFAIR INSURANCE	Mayfair has weather-indexed and agnostic crop insurance products that target farmers throughout Zambia

CETZAM is current insolvent; MBT is also no longer operational

MFIs tend to be distributed with the population density (hence concentrated in urban areas) while the post office and NSCB branches tend to be distributed equally geographically (hence reaching the marginalized rural populations).

[81] A Market Study on Microfinance Services in Zambia, 2014; respective institution websites

Figure 36: Distribution of non-bank financial institutions in Zambia[82]



Financial Services for SHF

AFA's mandate is to enhance access to financial services to SHF; consequently, one of the most critical parts of this ecosystem 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.[83] 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.[84] In Zambia, there are over 1.5 million smallholder farmers, with about 49.7% of them lacking access to financial services (FinScope, 2015).

The opportunity for digital financial services (DFS) for smallholder farmers is still unrealized in Zambia: meaningful awareness, access, ability, and willingness to use DFS is quite low. This portion of the study identifies providers and relevant products on offer for SHF in Zambia and identifies most promising product opportunity areas given SHF needs. We completed a comprehensive landscape study of financial service providers and products across all types of digital services. The Zambian financial services sector is characterized by four major types of institutions.

[82] Bank of Zambia, FSDP Progress Report, 2015; 2010 Census; ZamPost website, 'http://www.zampost.com.zm/locate.html
[83] Agriculture sector strategy 2010–2014, African Development Bank; World development report 2008: Agriculture for development, World Bank
[84] Catalyzing Smallholder Agricultural Finance, Dalberg 2012.

Figure 37: Types of financial service providers in Zambia

	Description	Examples	Services Offered	
Formal prudential	Service providers that are prudentially regulated and supervised by independent statutory regulatory agencies (e.g., Bank of Zambia, Pension and Insurance Authority)	• **Commercial banks**: 19 commercial banks • **Deposit taking microfinance institutions**: 5 first-tier MFIs • **Insurance providers**: at least 27 insurance providers	Credit	✓
			Insurance	✓
			Saving	✓
			Transactions	✓
Formal non-prudential	Service providers that are subject to non-prudential oversight by regulatory agencies or government departments/ ministries with focused legislation	• **Mobile phone service providers:** 3 MNOs (Airtel, MTN, Zamtel) with 11 million subscribers *Alternative payment services typically use MNO platforms* • **Over-the-counter solutions:** Zoona • **Micro-insurance providers:** MicroEnsure, MNOs	Credit	✓
			Insurance	✓
			Saving	✓
			Transactions	✓
Formal registered	Service providers that are registered under a law or government direct interventions	• **Credit-only MFIs**: Over 30 second and third tier MFIs • **Cooperatives**: ~8000 registered agriculture cooperatives (c.2010) • **Non governmental organizations:** e.g., Off-takers (e.g., NWK Agri-Services), input providers, donors (e.g., USAID's PROFIT +)	Credit	✓
			Insurance	✗
			Saving	✓
			Transactions	✓
Informal	Financial services obtained through unregulated forms of structured provision	• **Informal groups:** ROSCAs and ASCAs (chilimba) • **Shopkeepers/Merchants:** Agro dealers and other shop owners can offer shop credit • **Employers** • **Money lenders**	Credit	✓
			Insurance	✗
			Saving	✓
			Transactions	✗

Through secondary research, 78 financial service products by 32 providers were evaluated targeting or clearly serving farmers and either entirely or partially digital. Although there is a quite a number of financial products targeting farmers, many cater to emergent and commercial farmers. The most common financial products are asset financing and working capital loans. About half of the products had some digital compatibility. Commercial banks and microfinance institutions are involved in the most number of products. However, many service providers collaborate with at least one other provider to roll out products e.g., Standard Chartered has partnered with MTN and Airtel for their **Straight 2 Bank wallet** – a bulk payment platform to allow payments from the bank to mobile wallets**;** Airtel with Micro Ensure and Focus General Insurance for the **Airtel Life Insurance** – a free life insurance service for Airtel customers, based on airtime usage; and MTN with Jumo for **MTN Kongola** – a loan product where MTN mobile money and airtime usage are utilized to determine loan size eligibility. Figure 10 (earlier in the report) lays out a quick review of financial services and products in Zambia.

As shown in the table below, we assessed these products to establish their level of development based on four key criteria: (i) number of products within a particular offering i.e., transactions, savings, loans, insurance; (ii) number of service providers such as MNOs, commercial banks, NGOs etc. that offer a particular type of product; (iii) the potential to reach smallholder farmers i.e., how accessible is the product and how well is it designed for SHF needs and usability; (iv) lastly, digital capability or potential i.e., to what extent is the use of digital tools to operationalize the financial products and services being provided. As can be seen in the figure below, financial products targeting farmers are still underdeveloped and have a low uptake among farmers. High interest rates and lack of collateral limit farmers from accessing loan products; while a lack of awareness limits the uptake of insurance. In our interviews with

farmers we saw a high appetite for insurance products as farmers had lost their harvest to drought in the previous year.

Figure 38: Landscape analysis of financial products focusing on agriculture / SHF

Key: ● Most developed ○ Least developed

Type of product		Level of development	Current situation
Savings	Commitment savings for Ag	○	• **There are no notable formal service providers** offering commitment savings products specifically for agriculture
	General savings products	◕	• About two-thirds of Zambians save. Of the savers, half save at home while a third save at a bank • All commercial banks offer various savings products • Over 22% of mobile money users use mobile money to save or store money through various mobile money platforms. **In partnership with Zanaco, Airtel launched Cultiv8, a bank-like savings account that is entirely targeting farmers** – however, this is currently not active
Credit	Seasonal based loan	◑	• **Several commercial banks and MFIs** (e.g., FNB, IZB, CETZAM, Agora) offer seasonal-based loans to accommodate for agricultural cycles. ZNFU has also partnered with several banks to facilitate the issuance of these loans
	Asset financing	◕	• Several banks offer asset financing. Most notably, **Zanaco's Lima credit scheme** and **Bunjimi asset plus** offer financing for mechanization inputs, irrigation material and storage facilities among others.
	Trade finance	◔	• Trade finance products are normally available to importers and exporters and less to farmers • Notable players include Barclays, Standard Chartered and FNB
	Working capital loan	◕	• **Majority of commercial banks and microfinance institutions that service famers provide this type of loan.** Farmers are also able to access working capital through both formal and informal means. • **These loans are offered to individuals, groups and societies** • Most lending institutions that offer agriculture related loan (such as season-based loans, input loans and asset financing) also offer working capital loan. Notable examples are **Micro Bankers Trust** livestock/dairy loans and **Finance Bank Zambia's** seasonal working capital loan
	Non-agriculture general loans	●	• Most formal and informal service providers offer this type of loan. A large percentage of adults in Zambia use the informal sector for loans from groups and family/ friends • **There are many notable players providing non-agriculture general loans, including most banks and MFIs.** By capitalizing on the increase in mobile subscribers and mobile money platforms, MTN in partnership with Jumo has launched Kongola, Zambia's first digital unsecured micro-credit product.
	Warehouse receipt systems	◔	• Warehouse receipt system is nascent and largely underutilized system in Zambia. The **Zambia Agricultural Commodity Exchange (ZAMACE)** is working to develop the system further
Insurance	Personal insurance	◕	• Personal insurance products, particularly health and life insurance products, are offered by multiple insurance providers in Zambia. Micro-insurance is gaining momentum: there are currently 3m micro-insurance policies in Zambia • **Both MTN and Airtel offer personal insurance products to their customers.** Airtel offers a 'free' loyalty-based life insurance while MTN charges a monthly premium from airtime • However, uptake is still low
	Crop & livestock insurance	◑	• There are **several insurance companies** that offer crop insurance for specific crops. The most prominent insurers include MicroEnsure, Madison General Insurance Company and Focus General Insurance Ltd
	Index insurance	◑	• The Global Index Insurance Facility (GIIF) assisted three insurance companies (**MicroEnsure, Mayfair Insurance Co., and Focus General Insurance Ltd**) launch index insurance products for farmers. Over 60,000 maize and cotton farmers were insured in 2016 through a partnership with ZNFU • MicroEnsure partnered with NWK Agri-services (Zambia's leading cotton company) to launch FarmerShield, a life and weather index insurance for cotton farmers.

Lastly, some FSPs and donors have products / programs that are exclusive to or heavily focus on women. However, these are still very few and women smallholders still remain underserved by formal financial institutions.

Figure 39: Financial services targeting women

	Program / Product	Provider / Donor	Activities
Donor program	**Production, Finance & Technology Project (PROFIT+)**	USAID	• PROFIT+ is a $24m grant to increase agricultural productivity and expand markets and trade in maize, oilseeds, and legumes with **special emphasis on women** • It targets to reach 200,000 SHFs • It is implemented by ACDI/VOCA and is scheduled for completion in 2016
Financial product	**TWENDE Loan**	Micro Bankers Trust	• TWENDE (Towards Women's Economic Needs Development Empowerment) loan is a loan that is disbursed to **women groups** and accessed by individual members. With groups of 5, each group is held responsible for the collateral-free loan. Loans start at 1000 ZMW at a rate of 35% p.a. and borrowers can unlock higher amounts after demonstrating good credit behavior. • In 2011, they had over 13,000 active clients with loans
	Lima Credit Scheme	zanaco	• This is a financial scheme administered by the ZNFU that offered access to input finance. It is conveniently bundles with crop insurance to make the product more appealing to farmers and reduce the bank's risk in lending to farmers • The credit scheme promotes **women participation** and a third of its 25,000 clients are women. The proportion of women clients has also been increasing since the product was launched in 2008

Non-financial Services for SHF

A critical driver for the innovation to transform services for SHF is the portfolio of emerging technology companies focused on solving the tough problems faced in agriculture, including access to markets, information, improved inputs and infrastructure Through secondary research, 18 non-financial service products by 6 providers were evaluated targeting or clearly serving farmers and either entirely or partially digital. Figure 15 (earlier in the report) lays out a quick review of non-financial services for SHF in Zambia

Similar to the financial products we assessed these products to establish their level of development based on the same four key criteria: (i) number of products within a particular offering; (ii) number of service providers that offer a particular type of product; (iii) the potential to reach smallholder; (iv) lastly, digital capability or potential. From this assessment we see that several platforms exist for farmers to get access to extension and information services – these are provided by government, private sector, and development actors. However, there is low farmer participation in the extension programs and many still remain unreached due to the high concentration of extension officers in certain areas, particularly those close to infrastructure (road and rail). Other non-financial products such as traceability, logistics management, trading platforms etc. are still highly underdeveloped in Zambia. In Annex 1.4 we provide an illustrative representation of players across the different non-financial service offerings in Zambia.

Figure 40: Landscape analysis of non-financial products focusing on agriculture / SHF

Key: ● Most developed ○ Least developed

Type of product		Level of development	Current situation
Info. services	**Agricultural information services**	●	• Several players offer price information services through mobile phones. **ZNFU**, through their ZNFU 4455 USSD app, offers up-to-date market price information. The **National Agricultural Information Services** (NAIS) has an online and mobile platform for disseminating agricultural information. **TTC Mobile's** SMS-based platform gives agriculture tips, weather updates and agricultural alerts
	Extension services	●	• The Ministry of Agriculture and Livestock offers extension services through its specialized information wing, the **National Agriculture Information Services** (NAIS). NAIS uses both mass media (radio programs, TV documentaries, etc.) as well as mobile technologies to disseminate relevant information and offer extension services to farmers. Recently, NAIS has been disseminating information via online and mobile platforms while allowing farmers to send in questions and feedback, hence offering digitally-enables extension services and farmer helpline service. **ZNFU** also offers e-extension services to farmers via mobile phones
	Farmer helplines	◑	• **TTC mobile** and **NAIS** are the noteworthy providers of farmer helpline services. Their mobile and online products allow farmers to send in questions and requests via messages and receive support via the same channel
Supply chain services	**Logistics**	◔	• There is only **one notable player** supporting agricultural logistics for SHFs in Zambia. **Transzam** puts farmers and truck drivers in touch to help them manage and organize the transport of agricultural products from fields and rural areas to urban centers. This system is equally beneficial for farmers and for drivers with available space. The platform was championed by the ZNFU
	Traceability	○	• There are no notable players offering traceability services in Zambia
	Supplier mgmt.	◔	• Supplier management services are nascent in Zambia. One notable player is **iDE Lima Links.** It provides a platform for agriculture traders and retailers to manage their suppliers (i.e. farmers) and request specific amounts of produce from different farmers. The platform is currently limited to the horticulture value chain
	Distribution mgmt.	○	• There are no notable providers of distribution management systems
	Trading platforms	◑	• There are **two notable players** that facilitate and maintain trading platforms: **ZAMACE** and **iDE Lima Links**. ZAMACE facilitates commodities exchange and warehouse receipting while iDE Lima Links connects farmers to markets and buyers to farmers.
Market access services	**Tendering platform**	○	• There are no notable tendering platforms available to farmers in Zambia
	Bartering platforms	○	• There are no notable bartering platforms available to farmers in Zambia

Policy and Regulation

Digital Financial Services (DFS) are expanding the possibilities for those who are financially excluded or underserved, allowing them to access formal financial services. With innovative DFS products being introduced in the market, new regulatory considerations arise to ensure that services are delivered in an affordable manner that protects the consumer, while being sustainable for the providers. Of equal importance is ensuring that the regulatory environment does not stifle innovation, nurtures healthy competition, and promotes collaboration among service providers.

The regulatory environment in Zambia is flexible and dynamic having been the first African country to introduce DFS. Bank of Zambia (BoZ) is keen on ensuring that regulatory processes do not impede innovations in this space. Several regulatory documents exist to govern DFS in Zambia. These include: (i) the National Payment Systems Act (2007) which permits private businesses to be designated to conduct DFS in Zambia and provides a mandate for the BoZ to oversee payment systems businesses; (ii) the Bank of Zambia Anti-Money Laundering Directives (2004) prescribes how to transact, providing necessary Customer Due Diligence and other obligations for institutions carrying out transactions; (iii) the BOZ issued the National Payment Systems Electronic Money Issuance guidelines (2015) as part of the NPS Act. These provide a guide on minimum requirements, transaction limits, unclaimed e-money and the associated accounts. The guidelines also shade light on Distributors, Agents and Outsourcing. Further, it tackles issues

of customer requirements like Know Your Customer requirements (KYC) etc.[85] Bank of Zambia has been, and continues to be, responsive to the needs of the market as they arise. For example transactional limits have been adjusted periodically in line with market demands since the DFS market began operation.

Priorities areas for DFS in Zambia should be around improving interoperability, improving competition, and supporting improved digital financial literacy. In broad terms, interoperability is the interconnection of mobile money services with external parties, with the aim to create value for both customers and commercial players. Interoperability development in Zambia is being promoted by the development of a National Financial Switch. The project which is in advanced stages and is led by the Bankers Association of Zambia and the Bank of Zambia. Interoperability will fuel the next wave of growth in mobile money service.

Figure 41: Summary of DFS regulatory environment in Zambia[86]

	Key Findings	Sources
Platform management	• **Interoperability:** Though system interoperability is a stated BOZ requirement it is yet to implemented and MNOs charge significant premiums to connect to competitor networks • **Agent exclusivity:** Zambia has very high levels of agent exclusivity (91%) compared to Kenya (87%) and Tanzania (28%). This limits the pace of agent network expansion in a competitive market • **USSD access:** Regulators grant banks and other 3rd party providers access to USSD codes; thus, unlike in Kenya, access to USSD codes is not a barrier to entry in Zambia.	Interviews with BOZ and Airtel; Company websites; Agent Network Accelerator Survey: Zambia Country Report 2015
Customer management	• **KYC:** There are no simplified "know-your-customer" guidelines presenting a challenge with regards to registration for mobile money. Registration is time consuming and not available through all agents. There has been a major push by all 3 MNOs to register all sim cards and simultaneously conduct KYC and registration for mobile money	Digital financial services in Zambia 2014 - UNCDF
Government commitment	• **Bank of Zambia** has shown commitment to mobile money growth, incorporating input from MNOs to introducing the **National Payment Systems Act** in 2007, which provides adequate space for a range of DFS providers to enter the market. • The Bank of Zambia is a champion of financial inclusion, **viewed favorably by the industry by banks and non-banks alike**, and has taken a consultative and 'watch and learn' approach to DFS • There is a **DFS working group** that addresses policy issues related to DFS. It constitutes of banks, MNOs, UNCDF and FSDZ	Digital financial services in Zambia 2014 - UNCDF

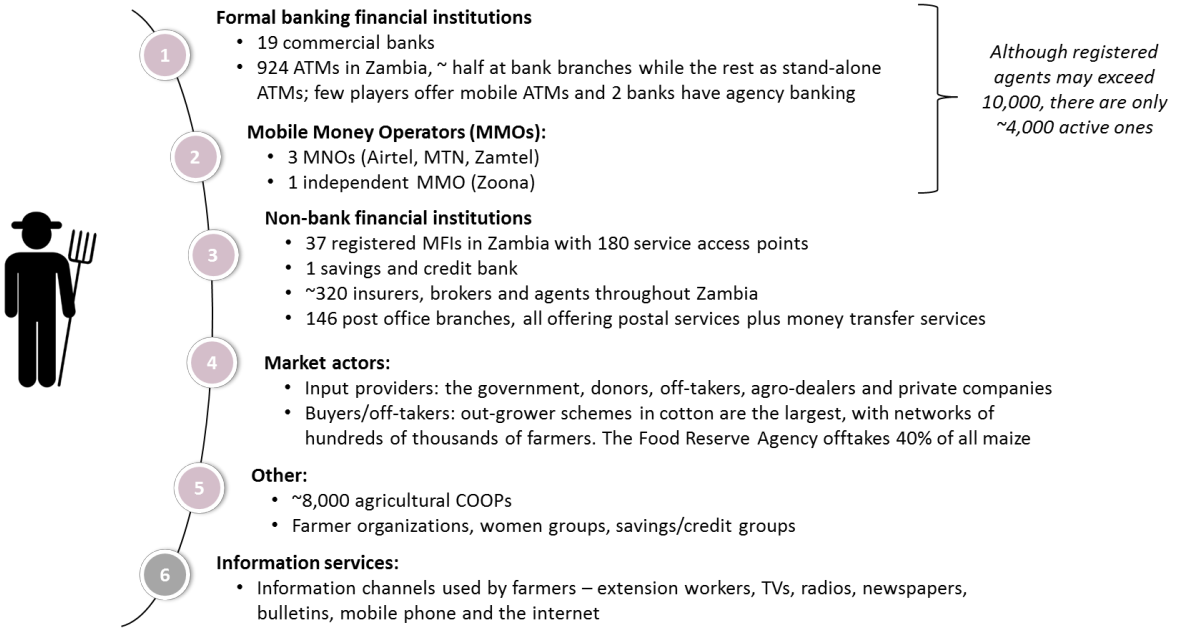
Delivery Channels

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.

Smallholder farmers in Zambia utilize a range of delivery channels to access financial and non-financial services. These include:

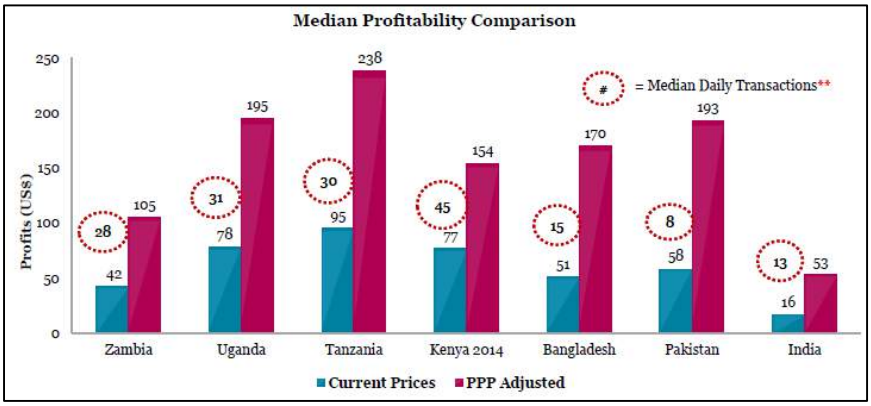
[85] Financial Sector Deepening (FSDZ) Zambia 2017: Regulation and Policy Overview for Zambia
[86] AFA Zambia Ecosystem Study, Dalberg 2016

Figure 42: Service delivery channels for smallholder farmers in Zambia



DFS providers – formal banking financial institutions and MNOs

One of the most significant constraints for access to and use of DFS in Zambia 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 being located in rural areas, only 39% of agents operate in rural areas.[87] Rural agent activity rates are low and liquidity more difficult to access. About 40% of agents depend on the business owners to manage liquidity while the rest travel to the bank to re-balance, an activity that can take long due to crowding at bank branches. Additionally, the current business models for agents in Zambia in not commercially viable; total earnings reported by Zambian agents (US$ 180, PPP adjusted) are below the Zambian GNI per capita (US$ 308, PPP adjusted)[88]. Median profits are reported at $42, compared to $95 in Tanzania, and $77 in Kenya. Due to low commissions from service providers and limited DFS use, Zambian agents make the lowest profits compared to other countries like Uganda, Tanzania, Kenya, Bangladesh, Pakistan, and India (Helix, 2015). This leaves room to restructure the current agent model and commission structure in order to increase profitability of agents and thus boost uptake of DFS in Zambia.

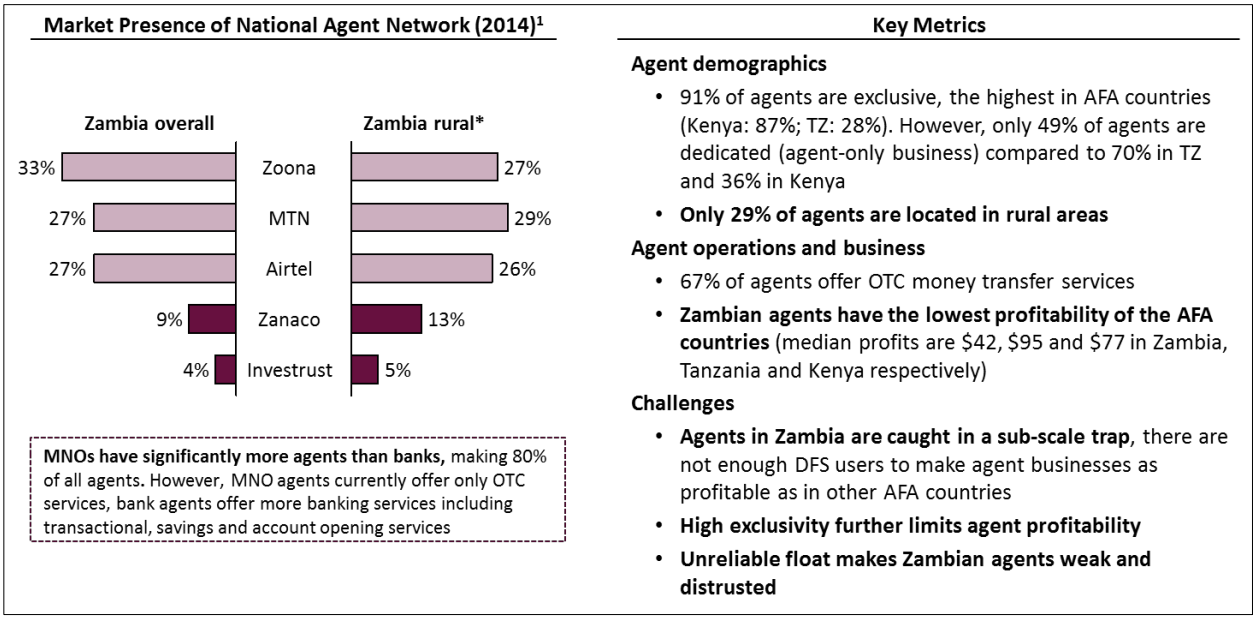


[87] GSMA "2013 Mobile Money Usage Survey"
[88] Agent Network Accelerator Survey, Zambia Country Report 2015

The AFA program seeks to support the development of 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 Zambia with digitally-enabled products and services, both financial and non-financial.

The Zambian DFS market is highly fractured with no clear leader. MNOs make up over 80% of the agent network, with Zoona having the largest market share at 33% of all agents, followed closely by MTN (27%) and Airtel (27%). Zanaco and Investrust follow, albeit distantly, with relatively greater presence in rural areas (9% and 4%, respectively)[89]. These agents are primarily exclusive and majority have only been in operation for one year or less. Although majority of the Zambian population in rural, only 29% of all agents are in rural areas. With over 67% of all agents primarily offering money transfer services, Zambia could become an OTC-led market like Pakistan. However, given DFS is still at an infancy stage in Zambia, the market could still shift to a wallet-based market like Kenya, or bank-led like South Africa.

Figure 43: Agent networks in Zambia - key metrics



Market actors –input providers, buyers, and COOPs / farmer groups

Outside of banks and MNOs, other common service delivery channels for smallholder farmers in Zambia include input providers, offtakers / buyers, cooperatives / farmer groups. However, even with these delivery channels, the challenge of last mile delivery in Zambia is very real and often the last 1 mile is the last 100 miles!

[89] Agent Network Accelerator Survey, Zambia Country Report 2015

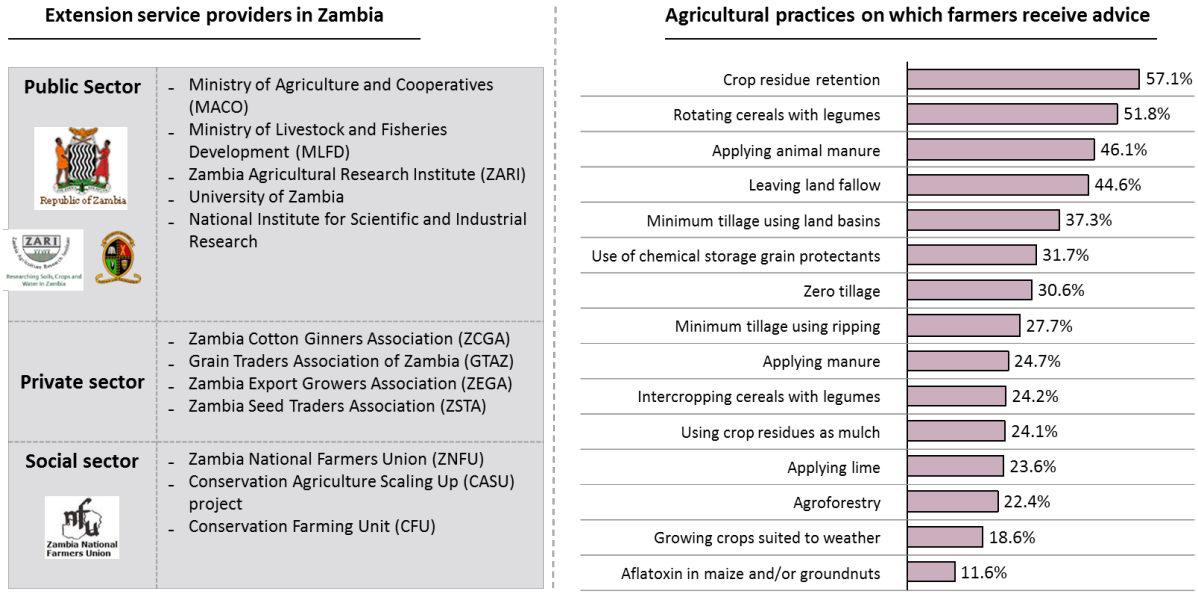
- **Input providers[90]:** the government program, Fertilizer Input Support Program (FISP) and agrodealers are the main source of inputs for SHF; about 60% of all households use FISP, while 44% use private retailers. Major input companies include Cargill, Yara, MRI Syngenta, SeedCo, Zamseed and Kamano Seed. Out-grower schemes and contract farmers receive financed inputs from off-takers. This is popular for cash crops such as cotton. A few players have started to work through agro-dealers to deliver additional services to SHFs; for example, Syngenta has set up 100 community agro-dealers (reaching 10,000 farmers) to deliver inputs and extension services to farmers while securing market access with local off-takers. FSPs such as FNB, Zanaco, and Stanbic bank have distributed POS devices to agro-dealers to allow more than 200,000 farmers to use their FISP e-vouchers.
- **Offtakers / buyers[91]:** most smallholder farmers operate in unstructured value chains and primarily sell to brokers or in nearby open air markets. In structured value chains, they sell their produce to off-takers either directly or through farmer associations. Since farmers live an average of 42km from a district town (and 26km from a local market), brokers and small buyers/truckers are the main channel for taking SHF produce to market. Cash crops (e.g., cotton, sugarcane) have ready off-takers, some who pre-finance the inputs. The Food Reserve Agency is the largest buyer for maize (40%); WFP off-takes pulses and oilseeds while Export Trading Group off-takes cereals, legumes/pulses and oilseeds for export. Supermarkets off-take fresh horticultural products. However, most horticulture retailing happens at open-air markets, grocery shops, and with street vendors.
- **Co-ops / farmer groups[92]:** the primary channels of farmer aggregation in Zambia are through farmer associations (cooperatives, primary societies), local savings and loan societies, women's groups and outgrower schemes. 44% of farmers belong to a farmer association / co-op while 19% are in women's groups. Only 5% are in local savings and loan societies. The co-op movement has 4-tiers: the Zambia co-op federation (apex), 10 provincial co-op unions, 105 district co-op unions, and over 20,000 primary co-op societies. Majority of the 20,000 co-operatives comprise of ~100 people. In 2010, there were ~8,000 co-ops directly involved in agriculture (40% of all co-ops) and 10,000 multi-purpose co-operatives. While some co-ops may offer farmer trainings, input financing, agricultural information services, and market access, a majority of the primary co-op societies were created as a means through which FISP subsidies are disbursed and are only active during FISP season. Some exceptions include VC-specific co-ops, e.g., dairy co-ops. In less structured value chains, co-ops are non-existent or play a much smaller role, with produce traded informally through agents or at open-air markets; farmers in these value chains are typically in multi-produce societies. In cash crops with contract farming schemes (e.g., cotton), farmers are aggregated around a lead farmer or a distributor. Some NGOs also do farmer aggregation; for example, COMACO has organized 89,000 farmers into 4,800 producer groups to provide input support, extension services and offtake produce

Information channels for smallholder farmers in Zambia

Among Zambian farmers, extension services and bulletins are the key delivery channels of agricultural information. Extension services are provided by public, private, and the social sectors (see the figure below).

[90] IAPRI
[91] Rural Agriculture Livelihoods Survey 2015, 2016; AFA Zambia Ecosystem Study, Dalberg 2016
[92] Status Report on the Provisional Statistics on Registered Co-operatives, 2014

Figure 44: Informational and extension channels for SHF in Zambia[93]



These services typically include a range of information on best farm management practices. However, agricultural extension services are not easily accessible given the average distance to an extension work is about 17 kilometers. In fact, out of the 1,757 agricultural camps, only 76% of them have an extension officer. In the Sixth National Development Plan, the government planned to have 4,965 agriculture and 2,611 livestock extension officers by 2015 (it is unclear if target was met)[94]. Several NGOs also provide extension services; for example, HarvestPlus works with 480 women groups to train them on orange maize farming and operating agricultural businesses. Other NGOs offering extension include COMACO (offering extension to 89,000 farmers), CFU (offering extension to 200,000 farmers), and PROFIT+ (targeting 200,000 farmers). On the private sector side, out-grower schemes and contract farmers receive training and extension services through their off-takers, e.g., Alliance Ginneries recruits lead farmers, sets up demonstration plots and invests in training farmers and offering on-going extension support to its 33,000 contract farmers[95].

Farmer training programs are primarily value chain specific (for example HarvestPlus focusing on orange maize) or focused on specific service offerings such as agronomic practices (for example use of improved seeds, use of fertilizers, better land preparation, climate smart agriculture etc.). The level of farmer capability and training programs varies significantly across value chains i.e., structured VCs like cotton have a lot of actors providing farmer training, whereas unstructured VCs like poultry and potatoes have minimal focus from extension service providers / trainers. In addition to traditional farmer training and extension services, several sources of information are available to farmers digitally, although data on their effectiveness is currently unavailable. These are highlighted in the table below:

[93] Global Forum for Rural Advisory Services (GFRAS) 2016; Rural Livelihoods Survey 2015
[94] Rural Agriculture Livelihoods Survey 2015, 2016; Feed the Future, Assessment and Recommendations for Pluralistic Agricultural Extension System in Eastern Province, Zambia, 2014;
[95] AFA Zambia Ecosystem Study, Dalberg 2016

Figure 45: Digital informational services for SHF in Zambia[96]

	Digital Platform	Information Offered
Government & Public Sector	**National Agricultural Information Services**	Internet platform where farmers send questions on agriculture and receive answers on their mobile phones. Provided by Airtel
	Zambia Agricultural Research Institute	Improve communication between research institutions and farmers and between researchers and subject-matter experts
	AIMS	Agricultural Information Management System (AIMS) that provides storage and access to all types of agricultural information. Developed by TTC Mobile
	ZNFU 4455	Offers weekly prices for commodities obtained from over 100 traders & processors nationwide and available for all 72 districts. Provided by Airtel
	National Livestock Epidemiology and Information Centre	Digital Pen Technology (DPT) to improve real time reporting especially to veterinary camps in remote areas
NGOs	**Macha Works**	Farmers grow and market sunflower and jatropha using information from the internet
	CASPP, FISRI	Conservation Agriculture Scaling up Productivity and Production (CASPP) and the Farmer Input Support Response Initiative (FISRI) to improve efficiency in the distribution process
	iDE LimaLinks	A mobile phone point of sale (POS) and inventory control app that provides nearly 'live' horticultural market price data to farmers in Zambia
Private	**Zamace**	Certification of storage sites (warehouses), issuance of warehouse receipts, commodity exchange and oversight in the storage management and management of a market information system.

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.[97] Currently, ecosystem players lack effective, financially viable tools and models to meet this need. Capacity building is required in three main areas to leverage and build on existing farmer capabilities: 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 thus requiring 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, outlined below:

[96] Infobridge 2016

[97] Tarazi, "Serving Smallholder Farmers - Recent Developments in Digital Finance", Focus Note 94, June 2014

Figure 46: Constraints to uptake of digital financial and non-financial services

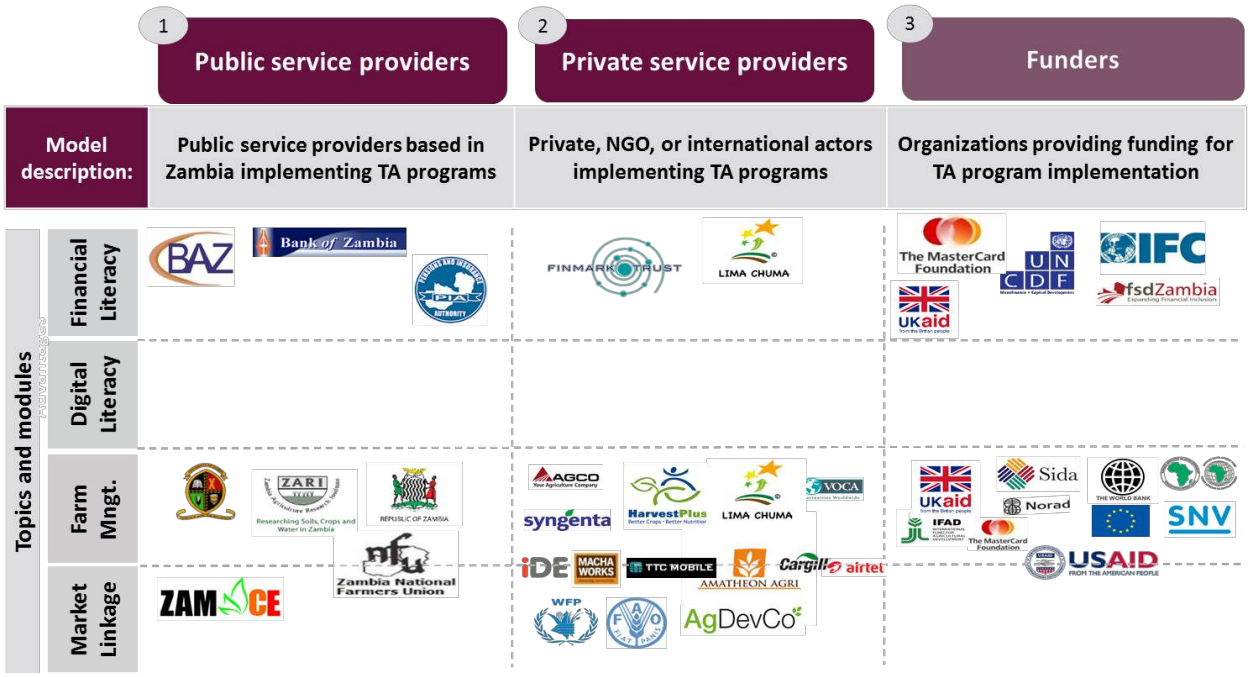
Digital Literacy	• SHFs are **not fully aware of the range of digital, financial and information services** available to them • **SHFs do not fully understand how to use the digital financial services in the market** • **Some have poor phone models that prevent them from fully accessing digital information services** • **Zambians in general have a preference for tangible cash over using digital services**
Financial Literacy	• SHFs **continue to use informal financial services**, such as VSLAs, due to financial exclusion from formal financial institutions • They **do not have required financial planning and management skills** • SHFs perceive **formal financial services as expensive** to use
Farm Management	• SHFs may be **unable to adapt to adverse climatic conditions** e.g. drought may hamper overall production Often, SHFs **do not generate enough income to purchase inputs or mechanization** • Farmers have **limited access to extension workers**, who are few in number and cannot support all farmers adequately
Market Linkages	• Farmers involved in **informal value chain**s e.g. groundnuts, do not have access to marketing organizations and major out growers • Farmers are **unable to add value to their produce**, thus limiting revenue • Farmers **do not have a choice over where and when to sell their produce**, due to cash flow constraints or long distance to market, forcing them to take low offer prices for their produce • Farmers are **unable to transport their crops to markets** due to **poor infrastructure**

For AFA, we understand that farmer capability interventions are critical to improve financial inclusion as well as overall productivity and profitability of smallholder farmers. In Zambia, low levels of digital and financial literacy limit smallholder farmers from accessing digital financial and informational services. Limited use of digital services results from lower awareness about its availability, poor development of agent networks, and distrust of mobile service providers. Lastly, technical capability for using digital services is a great challenge among women and youth, who typically have less access to training, as both demographic groups are often involved in unstructured value chains that are not linked to cooperatives and / or other farmer groups.

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.

International and local service providers are currently offering a range of approaches to support capability building to various players across value chains. The following table provides illustrative examples of large players including players in prioritized value chains, but is not exhaustive; this information is based on field analysis and public information from organization websites. In Zambia, the landscape for digital farmer capability building is still relatively weak, with most digital training programs focusing on market linkages (e.g., iDE Limalinks, TTC Mobile, Macha Works, ZNFU’s 4455 etc.).

Figure 47: Selected Providers of Farmer Capability Services



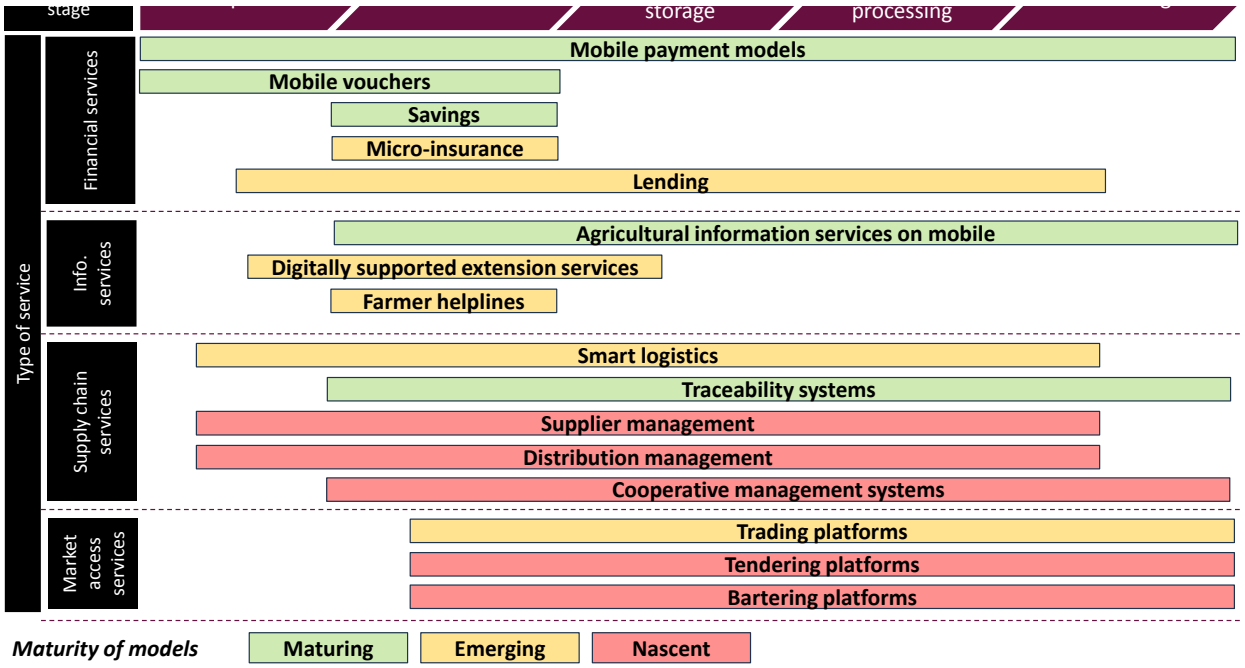
Innovative Technology Providers

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.[98] Emerging technology innovators providing services to enhance farmer productivity and access to services are 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.[99]

[98] AgriFin Facility Strategy. World Bank. 2010.
[99] GSMA, Digital Entrepreneurship Report, 2014

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 information.

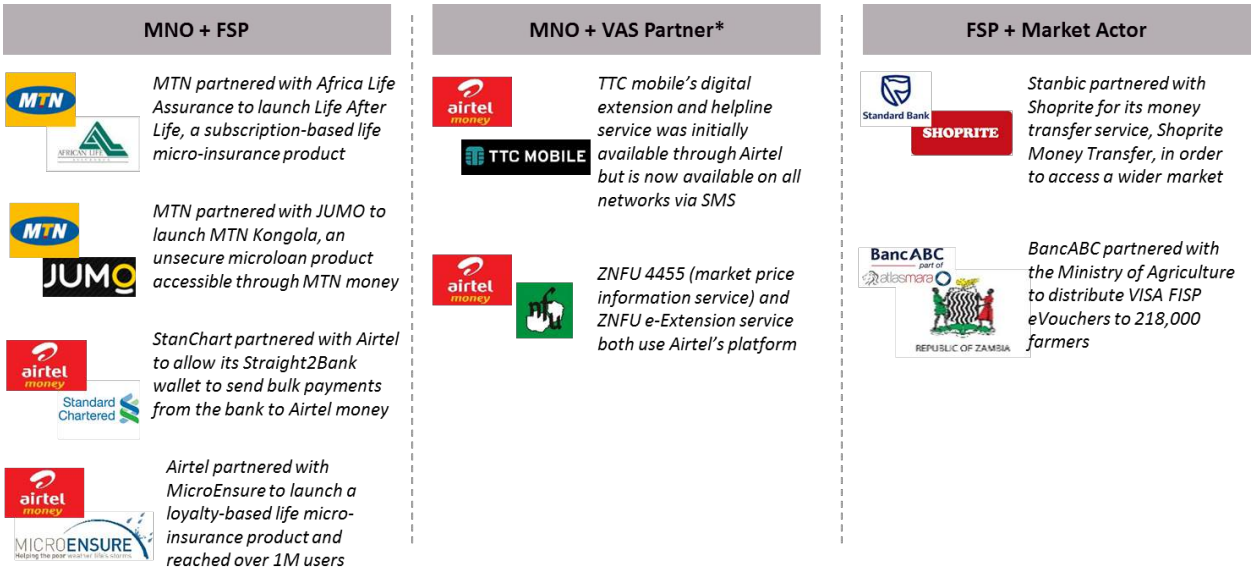
Figure 48: Opportunities for Digital Enablement in Agriculture (Vodafone Accenture)



This study provides a landscaping review of innovative solution providers in Zambia 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 Zambia, such as accelerators and incubators, which can help increase the scale and viability of their work.

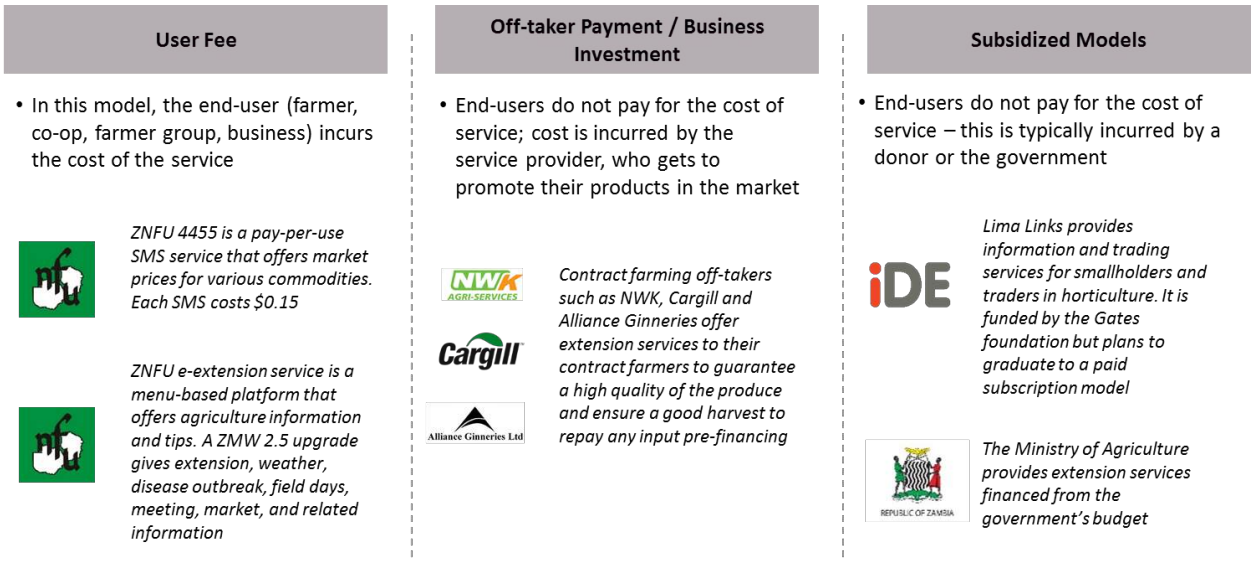
A few notable solutions are looking to reach significant scale through partnerships between banks, mobile network operators, insurance providers, the government, and/or other market actors. These partnerships are typically revenue share agreements between the partners involved. Examples of these partnerships are provided below:

Figure 49: Business models for larger scale financial products



Traditional extension services are provided by donors, the government, and off-takers. These are typically provided to farmers for free under off-taker payment or subsidized models. On the contrary, informational services delivered on digital platforms, such as ZNFU 4455, charge farmers usage fees which we speculate has an impact on adoption – with ZNFU 4455 for example, current usage is estimated at only 1000 texts per month. Some platforms like iDE Lima Links are subsidizing these costs through donor funding which has assisted in the overall ability to reach some degree of scale (pilot run from 2012 – 2016; 6,000 farmers registered and were using the system by the end of the pilot last year).[100] The following table illustrates the business model approaches used by some of the leading market providers in Zambia.

Figure 50: Business Models of Leading Digital Information Service Providers



[100] AFA Zambia Ecosystem Study, Dalberg 2016 – Interview with the organizations

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 is very nascent in Zambia, mirroring the slow adoption of mobile money and mobile technology in general. The few existing incubators and accelerators generally provide business development services (BDS), networking, mentoring and linkages to external funding sources. Most funding for startups is available through participation in challenge fund competitions. Donors such as Indigo Trust, the US Embassy and the DFID, have supported the growth of accelerators and incubators, as well as entrepreneurship and technology training in Zambia

Figure 51: Technology Innovation Support Services[101]

Category	Examples of Organizations	Services Offered
Sector funds / donors 7*	• Indigo Trust, Awesome Foundation, Pep Zambia, US Embassy, Citizens Economic Empowerment Commission (CEEC)	• Grant funding for start-ups, incubators, bootcamps, conferences, competitions • Minimal training / mentorship; 3 offer BDS through BongoHive • CEEC offers entrepreneur business loans
Startup incubators 6	• BongoHive, WECREATE, AgriProFocus, AgBits, Startup Junction, Zambian Entrepreneur	• All offer networking, BDS and some training; some offer mentorship • BongoHive and WECREATE have co-working spaces; also only ones with start-up funding
Challenge funds 3	• Nyamuka, Startupper of the Year, Zambia 2050	• All are business plan competition, offering winners up to ZMW 250,000 • Finalists receive mentorship and BDS
Co-working spaces 2	• BongoHive, WECREATE	• Provide physical space, business competition, peer-to-peer training, workshops & links with investors. BongoHive's BDS is more advanced

There are few players in the start-up space specifically targeting agriculture, youth and women; most are sector-agnostic: AgBiT and AgriProFocus are agriculture-specific, WeCREATE targets women, and BongoHive and Zambia 2050 target youth. The table below highlights these players – more details on the specific players can be found in Annex 1.5

[101] AFA Zambia Ecosystem Study, Dalberg 2016.

Figure 52: Landscape of incubators, challenge funds and sector funders / donors in Zambia

Type of Service	Description	Notable Players
Accelerators & Incubators*	• **Funding**: Provide linkages to networks and challenge fund competitions that provide seed level funding • **Mentorship and training:** Provide mentorship and training through experts in the field • **Physical space and resources:** Some provide spaces or online platforms • **Business development services:** Provide BD services as part of the program	Agri Pro Focus, AgBiT Agribusiness Incubation Trust, Zambian Entrepreneur, WECREATE, Startup Junction, BongoHive
Challenge Funds & Competitions	• **Funding**: Provide grant funding for startups at various stages of development • **Mentorship and training:** Provide minimal training and mentorship • **Physical space and resources:** None • **Business development services:** Provide minimal business development services	Nyamuka Zambia, Zambia 2050, Startupper of the Year
Sector funders/ Donors	• **Funding**: Provide grant funding for established businesses and incubators as well as startups at various stages of development. Donors channel the funds through incubators and challenge funds, who administer the funds to startups through business model competitions, bootcamps, etc. • **Mentorship and training**: Provide minimal training and mentorship • **Physical space and resources**: None • **Business development services**: Provide minimal business development services, often fund incubators to carry out the BDS	The Awesome Foundation, UKaid, indigo, VC4A, Fund for Rural Prosperity, PEP Zambia

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.[102] 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

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

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. However for Zambia, the cost of data is still high compared to the other AFA focus countries, at $10 / 1GB, compared to $5 in Kenya, and $0.89 in Tanzania[103].

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 Zambia 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 Zambia 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).

Alternative data use in Zambia is nascent, with only 7 notable players offering financial products using mobile and value chain alternative data. We see the landscape of alternative data providers as comprising mainly of MNOs, value chain actors, financial institutions, and specialist data firms:

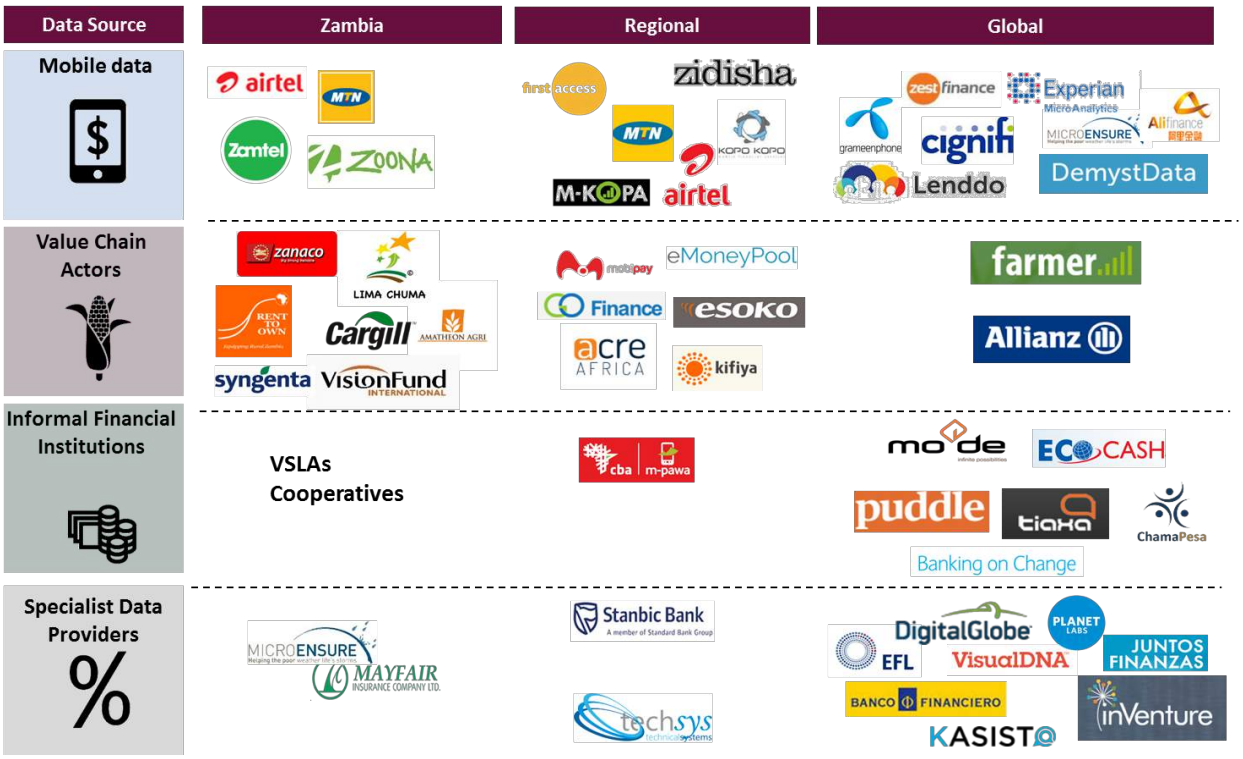
- **Mobile network operators:** MNOs collect rich information from transaction platforms that have been used to develop other digital financial products such as:
  - Loans: MTN Kongola based on MTN mobile money and airtime usage
  - Insurance products: Airtel Life Insurance based on airtime usage; MTN's Life After Life and MTN Edusure
- **Value chain actors** such as out grower schemes have farmer records that can be used as alternative data e.g. using production data to assess risk for financing and insurance premiums.
- **Formal financial institutions:** FSPs like Vision Fund and Zanaco are using history of production as alternative data to facilitate financing for smallholder farmers. Vision Fund does the assessment directly while in the Zanaco model, partners (such as ZNFU) are responsible for screening eligible recipients of the financing but credit risk is still taken on by the financial institution.
- **Informal financial institutions:** 1 in every 5 Zambians (21%) are affiliated with savings groups (Chilimbas)[104] that can be a rich source of the financial behaviors of those who are currently underserved by formal financial institutions. Banking on Change (a partnership between Barclays, Plan UK, and Care International) establishes VSLAs that provide savings options and loan services to members.
- **Specialist providers** include insurance firms that provide insurance policies based on weather data e.g. Mayfair insurance offers several agricultural policies that include weather-based index insurance and all-inclusive insurance policies i.e. covering fire, accident, theft etc. First Access uses mobile data and financial data –such as a person's utility and educational payments – to determine creditworthiness of a loan applicant. Business Partners Limited (BPL, a specialist risk finance company

[103] http://allafrica.com/stories/201610280049.html and http://www.manic.co.zm/vodafone-zambia-rates-comparison/
[104] FinScope Zambia 2015

for formal SMEs) utilized EFL psychometric analysis to complement existing data to assess financial risk across its markets in Africa – Kenya, Malawi, South Africa, Namibia, Uganda, Rwanda and Zambia.

The figure below is the landscape of alternative data providers in Zambia as well as regional and global players.

Figure 53: Alternative Data Providers Relevant for Smallholders



Alternative data use in Zambia is relatively underdeveloped, but there is opportunity to either use existing digital data such as Zoona transaction data or digitize existing data that is a by-product of some other primary business to develop algorithm for credit scoring. Specifically, input suppliers, buyers, and off-takers have detailed records on many of their farmer producers and may offer a valuable source of data, including mobile numbers. In addition, as aforementioned, many Zambians belong to savings groups (Chilimbas) that are potentially a rich mine of paper-based data. AFA is currently working with different actors in Kenya to explore use of alternative data to increase services for SHF and will be looking to support similar AD firms in Zambia as the program develops.

Summary and Conclusions:

In summary, findings from the Zambia 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 a 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 Zambian 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 54: Farmer unmet needs for financial and non-financial services

Key:
● high ◑ medium ◔ low

		Level of Need	Unmet Need
Financial Services	Transactions	●	• Transactions in Zambia are mainly performed on a **cash basis** • While mobile money is one of the easiest ways of offering digital financial services, **only 14% of the population currently uses it despite a 77% mobile penetration rate** • A **lack of awareness about MM** is one of the key reasons for limited uptake of mobile money services
	Savings	◑	• 70% of adults **save at home** • Rather than invest in their farms, most farmers **use their savings to ease cash flow** due to the seasonal nature of farming • Better savings options could allow farmers to **diversify their use of savings** beyond using it to minimize fluctuations in their income
	Credit	◕	• Current borrowing, when done, is done **via informal channels** which are very expensive to finance • **Formal financial institutions** have **strict requirements and high rates** which many farmers cannot meet
	Insurance	●	• **Drought conditions** will continue to affect Zambian agriculture that is largely rain-fed, while investment in smallholder irrigation may be limited due to fluctuating energy supplies • **Farmers currently lack awareness** of how to get insurance and how it works
Non-Financial Services	Info. Services	◑	• There are **many governmental and non-governmental agencies providing extension services to farmers** to improve livestock and crop production, but not much information about their effectiveness • **Digital information platforms may fail to be successful if farmers forget how to use the service or have poor phone models**
	Market access services	◑	• **Farmers do not have access to high value markets** • **Lack of clear government policies about import and exports** limits availability of external markets

Based on the Zambia Ecosystem Study 2016, 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 Zambian farm households engage in more than one value chain.

Figure 55: Opportunities for non-financial services and alternative data

High Priority	Medium Priority	Low Priority
• **Seasonal based loan:** seasonal-based loans respond most directly to farmers' seasonal income • **Working capital:** lack of capital limits both farmers and traders' ability to expand their businesses • **Index insurance, crop and livestock insurance, personal insurance:** SHFs in Zambia (unlike Kenya and Tanzania) consider insurance products a priority, given most at risk due to the drought challenges experience in Southern Africa • **Non-agriculture general loans:** many farmers rely on loans to pay for household expenditures as incomes are seasonal (education, health etc.) • **Trade financing:** in VCs where payments are made after farmers have sold produce (e.g. dairy), trade finance can be used to smooth farmer income • **General savings products:** formalized savings products would reduce risk of loss associated with informal saving mechanisms and be used as collateral • **B2C transactions**: digitizing bulk payments to farmers can reduce transaction costs for aggregators and ensure greater transparency	• **Asset financing:** loans are linked to incoming-generating assets, limiting diversion of funds to consumption or one-off expenses • **G2B (to C) transactions:** the Ministry of Agriculture voucher scheme presents an interesting opportunity to further develop DFS in Zambia • **C2B transactions:** services can be cost effectively used by farmers to pay other players in VC as well as repay loans and pay premiums • **C2C transactions:** still a developing market with Zoona leading in OTC transactions	• **Warehouse receipt:** currently very nascent in Zambia and would likely target maize production which is currently consider out of scope for AFA due to the need to diversify crops that SHF focus on • **Commitment savings for agriculture:** typically done through informal mechanism that create better incentives to save due to group pressure, a formal product may therefore have limited uptake • **C2G transactions:** given the informal nature of agriculture, this type of service is rarely access by SHFs

Figure 56: Opportunities for non-financial services and alternative data

High Priority	Medium Priority	Low Priority
• **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. • **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 • **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	• **Agricultural information services:** informational services complement extension services with climate and market information • **Cooperative and Chilimba management platforms:** allows group members to transparently track contributions an investments mitigating some of the risks of the service for consumers	• **Distribution management:** Given the existence of multiple service providers in the market, and a lack of expressed farmer need for these services these services are not a high priority opportunity for AFA • **Logistics, Tendering and Bartering platforms:** a lack of existing notable service providers in the market makes AFA provision of these services unfeasible

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.

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 input providers, agro dealers, and offtakers could present major impetus for improvement and is very realistic within the Zambian context. The figures below presents a number of critical questions that market actors should be thinking about as they engage with SHFs, as well as changes that would need to happen in the ecosystem to improve the income and productivity of SHF in Zambia:

Figure 57: Considerations for enabling actors in ecosystem

Donors

1. Is there a model of engagement that can support increased productivity for value chains like soya beans that have low participation amongst SHFs but are important for nutrition and food security?
2. How can donors better fund start-ups to replace the missing angel and seed capital?
3. How can donors support a better understanding of the causes of low uptake of DFS across Zambia and what SHF specific bottlenecks would have the highest impact if removed?
4. Would quantifying and comparing the cost of cash vs. investment required to drive uptake of mobile money help drive greater investment in DFS infrastructure e.g. more and better funded agent networks?

Investors

1. Which value chains are exhibiting high growth and potential for high returns i.e., ripe for commercial investment?
2. What stages of the value chain (e.g. aggregation, processing, and export market linkages) are lacking investment and show potential for sustainable investment?
3. With whom should we partner in Zambia to ensure successful interventions in the agriculture sector?

Government Bodies

1. How can government encourage more interoperability between the MNOs?
2. How does high level government involvement in the sector (e.g., controlled maize prices, pricing, export bans etc.) impact the ecosystem? How can negative externalities from these policy choices be mitigated?

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 actively share its learnings on all of these fronts as well as from all three focus countries (Kenya, Tanzania, and Zambia) with market stakeholders to help support this shift.

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

Annexes:

1.1. Stakeholders interviewed

The Dalberg and AFA teams conducted approximately 35 interviews with external stakeholders, as well as field trips and focus groups with farmers

Financial institutions	MNOs / MM Providers	Value Chain Actors
AB Bank Bank of Zambia FNB MayFair Insurance Stanbic Standard Chartered Bank Zanaco	Airtel Zoona	AGCO Alliance Ginneries Limited Amatheon Harvest Plus Snow Trading Syngenta Yuma Milling Zambia Cotton Ginners' Association (ZCGA) Zambia National Farmers' Union (ZNFU)

Other Market Actors	Tech Start-ups & Accelerators	Others
Agrotosh Mookerjee* COMESA Concern Worldwide One Acre Fund iDE Musika Rent to Own TechnoServe Vuna World Food Program (WFP) World Vision International (WVI)	Africonnect and Mezzanine BongoHive Lima Chuma	Choma Chieftancy Development Trust Program Against Malnutrition USAID

1.2. Literature reviewed to understand smallholder farmers in Zambia

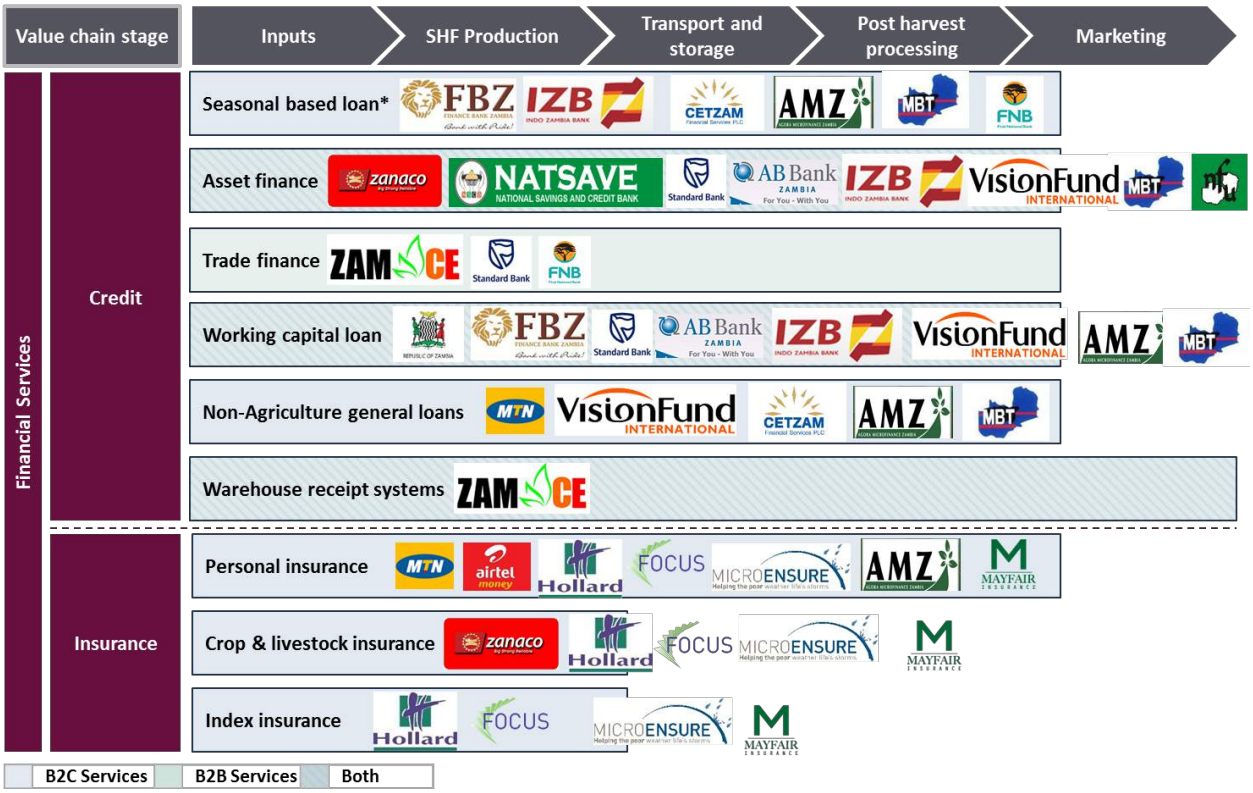
Report	Sponsors	Year	Topics covered
FinScope	FSD Zambia	2015	Survey measuring financial inclusion in Zambia, including usage of, demand for, and behavior towards financial services amongst adults in Zambia
FinScope FOCUS Paper 1: Women and Financial Inclusion in Zambia	FSD Zambia	2016	Survey of the state of women's financial inclusion in comparison to men's, including access to financial services and financial behavior and management
FinScope FOCUS Paper 2: Women Smallholder Farmers: Managing their Financial Lives	FSD Zambia	2016	Report combining qualitative and quantitative data from FinScope 2015 survey to consider the status of financial inclusion for women smallholder farmers, including challenges and opportunities for increasing their participation in agriculture and financial institutions
Zambia Financial Diaries: Interim Repot	FSD Zambia	2015	Year-long panel study of 352 individuals to tracking weekly transactions to gain deeper understanding of transaction behavior and use of financial services
Agent Network Accelerator Survey: Zambia Country Report	Helix Institute of Digital Finance	2016	A research report considering the factors leading to success in agent network management from agent demographics, business model, operations, float management and provider support
Consumer Behaviors in Zambia: Analysis and Findings	Intermedia	2016	A secondary research assessment of the FinScope 2015 study to identity the behaviors, interests and barriers to financial services access to optimize digital product adoption for banks, mobile network operators (MNO) etc.
ICTs and Agricultural Information Service Delivery	Infobridge	2016	A summary of the digital information platforms available for smallholder farmers
Profile of Zambia's Smallholders	World Bank	2008	A research paper synthesizing various qualitative and quantitative analyses on different smallholder livelihoods
Real Mobiles: Kenyan and Zambian Smallholder Farmers' Current Attitudes Towards Mobile Phones [Susan Wyche, Melissa Densmore and Brian Geyer}	World Bank and Facebook Inc.	2015	A qualitative study considering the attitudes of smallholder farmers to mobile phones include barriers that limit proper dissemination of information to farmers through mobile phones
Determinants of Smallholder Farmers' Access to Agricultural Finance [Christopher Sebatta, Mukata Wamulume, Chibamba Mwansakilwa]	University of Zambia, Makerere University and Palm Associates Ltd. Zambia	2014	A household survey of 1,326 households in 5 provinces investigating the factors that influence smallholders decision to take part in financial sectors
An Investigation into Zambia's Agriculture Development Framework and its impact on smallholder farmers	Oxfam	2013	A research study analyzing the impact of Zambia's Agricultural Framework to improve smallholders' livelihoods.
Briefing on Zambian Agriculture	Indaba Agricultural Policy Research Institute (IAPRI)	2016	An overview of the agricultural sector in Zambia, including the geography, demography of farmers, market actors and government engagement
Major Institutions Providing Extension/Advisory Services in the Country (Zambia)	Global Forum for Rural Advisory Services	2016	An overview of the agricultural landscape in Zambia including extension providers, digital platforms, and statistical information
Rural Agricultural Livelihoods Survey: 2015 Survey Report	Indaba Agricultural Policy Research Institute (IAPRI)	2016	A panel study examining the small and medium scale farming sector through the 2010 census sampling frame
Does Gender Matter When Evaluating the Economic Impacts of Land Titling in Zambia?	Indaba Agricultural Policy Research Institute (IAPRI)	2015	A policy brief drawn from a national household survey that examines how land titling impacts financial outcomes for women in male-headed vs. female headed households
ICT Survey Report – Households and Individuals	Zambia Information and Communications Technology Authority (ZICTA)	2015	A survey investigating the extent of access to ICT devices such as mobile phones, computers, etc.

1.3. Understanding smallholder farmers in Zambia

Percentage of farmers living in each province				
Province	Traditional male-headed HHs	Struggling families	Rising 30s	Market gardeners
Central	22%	22%	21%	36%
Copperbelt	25%	20%	19%	35%
Eastern	40%	25%	18%	17%
Luapula	22%	19%	18%	41%
Lusaka	22%	11%	38%	29%
Muchinga	24%	25%	16%	35%
North Western	21%	28%	20%	32%
Northern	25%	20%	20%	26%
Southern	22%	23%	15%	41%
Western	22%	16%	14%	49%

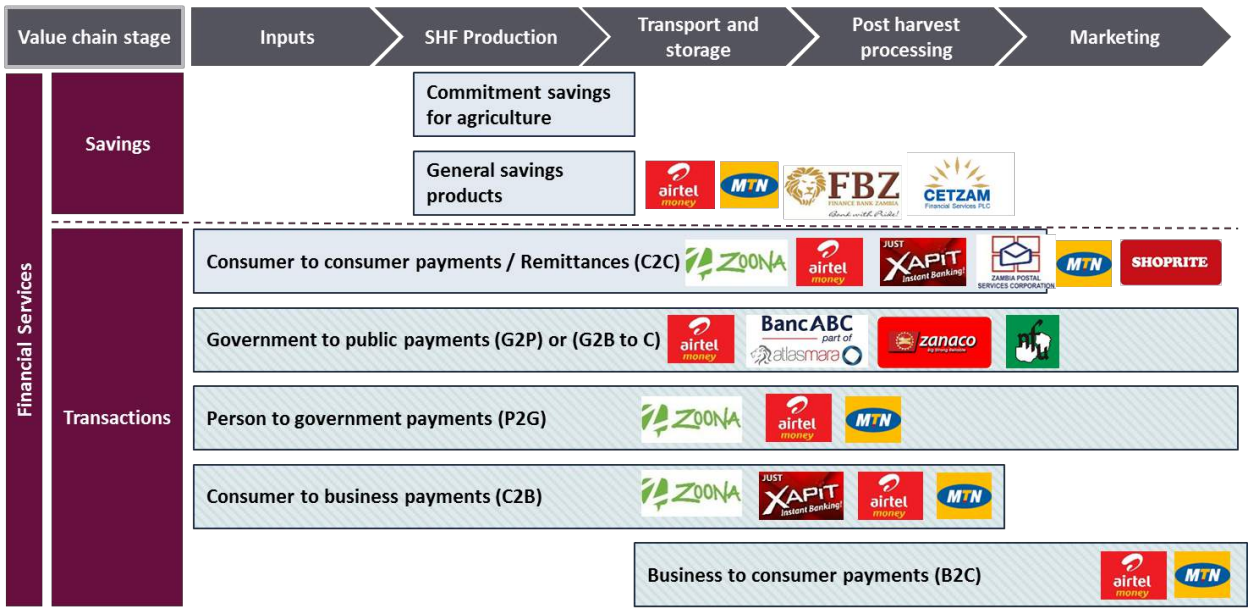
1.4. Landscape of financial and non-financial service providers in Zambia[105]

Major commercial banks, insurance providers, microfinance institutions, and MNOs dominate the credit and insurance markets

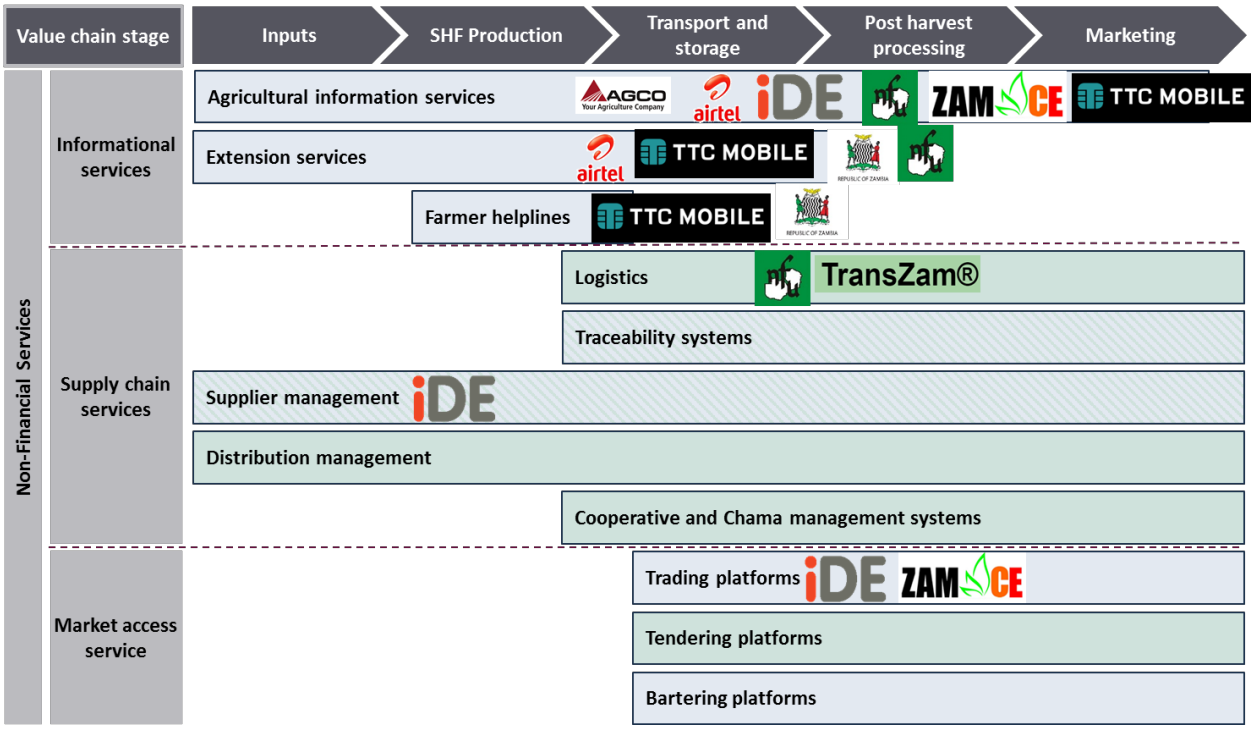


Mobile operators compete with commercial banks in the savings and transactions markets*

[105] These are only illustrative, not exhaustive of all the providers in Zambia



Non-financial services are primarily offered by MNOs, start-ups, and social enterprises*



1.5. Indicators used to calculate mobile money readiness index

The FinScope survey has a host of True/Not True questions that can be used to create a score measuring potential interest in mobile money

- Score is from 0 – 10 and based on the following questions:
    1. You do not like carrying cash
    2. You would rather deal with people face to face than with machines such as ATMs even if the machines are quicker (1 if not true)
    3. You are prepared to learn how to use new technology
    4. You prefer to pay for goods and services in cash rather than using electronic means (1 if not true)
    5. You would like to use a mobile phone to pay for goods and services
    6. You would like to use a mobile phone to put money away so you can use it later
    7. You would like to use a mobile phone to pay utility bills such as water
    8. One can easily lose money if you send/receive using a mobile phone (1 if not true)
    9. If you save money on your phone and your phone is lost you cannot get back your money (1 if not true)
    10. You have access to a mobile phone
- The score was calculated for farmers who have at least heard of mobile money

1.6. Zambia Accelerator Landscape

BongoHive and WECREATE are the only players that provide both co-working spaces and incubation programming.

Startup incubators/ accelerators		
Institution	**Description**	**Scale***
BongoHive	• **Description:** BongoHive is Zambia's first tech and innovation hub offering startup and tech programmes, workshops and events • **Funding offered:** Bongohive links startups with funding opportunities e.g. through business plan competitions, networking events, and financing after winning boot camp • **Technical assistance and business development services:** Offers a 3-stage startup programme that helps entrepreneurs build their ideas into scalable businesses. Also offers a range of masterclasses from website development to honing business skills • **Links with investors**: BongoHive has received funding to both support its operations (Indigo Trust), and to support startups through masterclasses (MTN, PepZambia), bootcamps (US Embassy) and challenge fund competitions (UNICEF)	• Data unavailable
WECREATE	• **Description:** Women's Entrepreneurial Centers of Resources, Education, Access, and Training for Economic Empowerment (WECREATE) is a center that seeks to help women initiate or grow their business • **Funding offered:** Hosts a business model competition for women entrepreneurs and offers cash prize to the winner • **Technical assistance and business development services**: WECREATE provides access to mentorship opportunities, business linkages, training, markets and other technical resources • **Links with investors**: WECREATE is a public-private partnership between the U.S. Department of State Bureau of Economic and Business Affairs (EB) and StartUp Cup	• Data unavailable

*Scale includes information on prize/funding, total funding per year or program period, number of startups supported, etc.
SOURCES: Services provider websites

AgriProFocus links entrepreneurs with different agriculture networks, while AgBIT provides formal incubation for agriculture focused startups.

Startup incubators/ accelerators		
Institution	**Description**	**Scale***
Agri Pro Focus	• **Description:** An online platform that seeks to enhance farmer entrepreneurship through facilitating linkages with agricultural professionals • **Funding offered:** None • **Technical assistance and business development services:** Provides business and network linkages for agribusinesses • **Links with investors:** Financial support is offered through SNV, MUSIKA, the Honorary Consulate of the Kingdom of the Netherlands and Agriterra	• As of 2015, Agriprofocus had 913 online members and had co-organized 21 events with a total of 1151 participants, 774 of whom were farmers • Had €290,521 revenue
AgBiT Agribusiness Incubation Trust	• **Description:** Agribusiness Incubation Trust (AgBIT) is an incubator specifically focused on developing startups and supporting the growth of SMEs in the agricultural sector • **Funding offered:** None, although AgBIT helps incubatees source for funds • **Technical assistance and business development services:** AgBIT offers business development services through business mentorship for SMEs, market linkages for smallholders, supply chain strengthening • **Links with investors**: AgBIT is funded by the Danish International Development Aid (DANIDA), Universities, Business and Research in Agriculture Innovation (UniBRAIN) and Forum for Agriculture Research in Africa (FARA)	• Has 6 incubates focused on the horticultural value chain

Zambia also has other initiatives that bring startups together for networking, mentorship and exchange of ideas

Startup incubators/ accelerators		
Institution	**Description**	**Scale***
Startup Junction	• **Description:** Startup Junction organizes entrepreneur meetups, links to entrepreneurs interested in taking Massive Open Online Courses (MOOCS) and workshops such as design thinking and business modeling • **Funding offered:** None • **Technical assistance and business development services: Individuals may gain** access to BDS through attending events and workshops on design thinking, business modelling, etc. • **Links with investors:** None, but may help connect entrepreneurs through their meet ups	• Since 2013, Startup Junction has hosted a StartUp Hour the first Wednesday of every month. The event features speakers from the startup and business spaces
Zambian Entrepreneur	• **Description:** Zambian Entrepreneur provides business development opportunities for entrepreneurs with business ideas or existing businesses through linking entrepreneurs with experts and investors • **Funding offered:** Helps entrepreneurs source for funding through various platforms e.g., crowdfunding, grants and matching with investors • **Technical assistance and business development services:** Zambian Entrepreneur provides various BDS services including strategic analysis, business structuring and valuation, transaction monitoring and investor matching • **Links with investors:** None, but may help connect entrepreneurs with various investors while sourcing for funds	• Data unavailable

For funding, Zambian startups have access to local and regional challenge funds, which are useful for fundraising and marketing.

Challenge funds and competitions		
Institution	**Description**	**Scale***
	• **Description:** Nyamuka is a business plan competition that funds up to 20 business ideas, along with providing business development opportunities and mentorship to finalists • **Funding offered:** Shortlists 20 finalists and offers ZMW 250,000 for first winner, ZMW 200,000 for second winner, ZMW 175,000 for the third winner, ZMW 150,000 for the second winner, ZMW 125,000 for the fifth winner and ZMW 75,000 for remaining finalists • **Technical assistance and business development services:** Offers all competitors business planning workshops, coaching, mentoring and networking sessions • **Links with investors:** Organized by Private Enterprise Programme – Zambia (PEPZ), funded by DFID	• Since inception in 2012, the fund has disbursed over ZMW 8 million to 60 finalists
	• **Description:** Startupper of the Year by Total is a business plan competition that aims to fund projects intent on improving social and economic welfare in Zambia • **Funding offered:** Up to 3 winners selected with ZMW 190,000 for first place, ZMW 120,000 for second place and ZMW 80,000 for third place • **Technical assistance and business development services:** Provides BDS for finalists through BongoHive • **Links with investors:** Funded by Total Zambia	• Offered a total of ZMW 780,000 to 6 winners in 2015 and 2016
	• **Description:** Zambia 2050 is a business plan competition seeking to fund a winning business idea from a Zambians under 36 years of age. Winner named Young Entrepreneur of the Year • **Funding offered:** Winning entry receives USD 6,000 or ZMW equivalent • **Technical assistance and business development services:** 10 Zambian finalists are offered 12 months mentorship from a mentor based in the UK or Zambia • **Links with investors**: Organized by Christian organization Newfrontiers	• Offered USD 6,000 to the 2015 winner

Sector funds /donors		
Institution	**Description**	**Scale***
	• **Description:** The Indigo Trust is a grant making foundation that funds technology-driven projects to bring about social change. • **Funding offered:** The Indigo Trust provides grants to launch innovation hubs across Africa. In Zambia, the Indigo Trust has invested in BongoHive operations and incubator in Zambia • **Technical assistance and business development services:** None	• Awarded USD 19,600 to BongoHive in 2011 (USD 7,700 for a mobile app competition, USD 5,500 for mobile app development training and USD 6,400 for internet subscription costs), and USD 25,500 in 2015 to support the position of a business incubation manager
	• **Description:** The Awesome Foundation is a global community with chapters across the world that gives micro-grants to support "awesome" ideas • **Funding offered:** The Lusaka chapter offers ZMW 8000 every two months to fund ideas of different types of projects ranging from those addressing a local challenge to those that need money for expansion • **Technical assistance and business development services:** None	• Started in June 2014, with a grant of ZMW 3,000. Currently disburses ZMW 48,000 annually

Donors are also funding a range of activities to support tech startup ecosystems both locally and regionally.

Sector funds /donors		
Institution	**Description**	**Scale***
	• **Description:** Pep Zambia is a GBP 14 million 5-year project funded by the DFID that aims to strengthen Zambian MSMEs and entrepreneurs through business linkages, business development services, a business plan competition and access to an accelerator fund • **Funding offered:** An open fund of a ZMW 30m (USD 5 million) to make investments in the range of ZMW 300k-1.2m ($50-200k equivalent), and a Technical Assistance facility of at least ZMW 15m ($2.5m) to provide ongoing Business Development Services (BDS) to investee companies • **Technical assistance and business development services:** Offers BDS to help address constraints to growth and competitiveness and business linkages between large firms and local suppliers	• Program started in 2014, and has implemented the Nyamuka Business Competition
	• **Description:** US Embassy Zambia has funded an entrepreneurship conference in collaboration with the WECREATE Zambia Centre and a six-month entrepreneurship boot camp in collaboration with BongoHive • **Funding offered:** Funded BongoHive and WECREATE. Offers USD 5,000 seed funding to team that successfully pitches a social venture idea after the six-month boot camp • **Technical assistance and business development services:** Grantees have organized business clinics for entrepreneurs and networking opportunities addressing challenges such as access to finance	• Funded BongoHive to host bootcamps in 2015 and 2016, awarding USD 5,000 to winning teams • Almost 400 individuals attended the entrepreneurship conference hosted in 2015

Sector funds /donors		
Institution	**Description**	**Scale***
	• **Description:** The Citizens Economic Empowerment Commission (CEEC) offers Zambian entrepreneurs business capital and finances in form of repayable business loans • **Funding offered:** Provides loans • **Technical assistance and business development services:** None	• Since 2008, the government has provided ~USD 33 million in loans[1]
	• **Description:** Venture Capital for Africa is an Africa-wide initiative that provides a platform for startups to access mentorship and funding, while allowing potential investors to access ventures they wish to engage • **Funding offered:** None, raise money from investors through the platform • **Technical assistance and business development services:** Free online tools and mentorship opportunities	• Has 54 Zambian ventures in its website
	• **Description:** A MasterCard Foundation fund, the Fund for Rural Prosperity is a Pan-African $50 million innovation challenge fund designed to improve the quality of life for 1,000,000 rural people through increased access to financial services. There are two types of competitions: innovation and scaling. The fund will have 5 more rounds (2 innovation rounds and 3 scaling rounds) until 2017 • **Funding offered:** $250,000 - $1 mil. per innovation project funded and $750,000 - $2.5 mil. for each scaling project. Scaling implementing partners provide at least 50% of the total value of the project • **Technical assistance and business development services:** None	• No Zambian grantees to date. In 2015, the fund awarded 9 winners in its innovation challenge fund and 5 winners in scaling challenge fund

*Scale includes information on prize/funding, total funding per year or program period, number of startups supported, etc.
SOURCES: (1) Figures at 2014, A Pro Poor Business Enabling Environment: The Case of Zambia, Services provider websites

Several donors and foundations are supporting the agriculture sector in Zambia.

1.7. Landscape of donors and foundation supporting Zambian agriculture

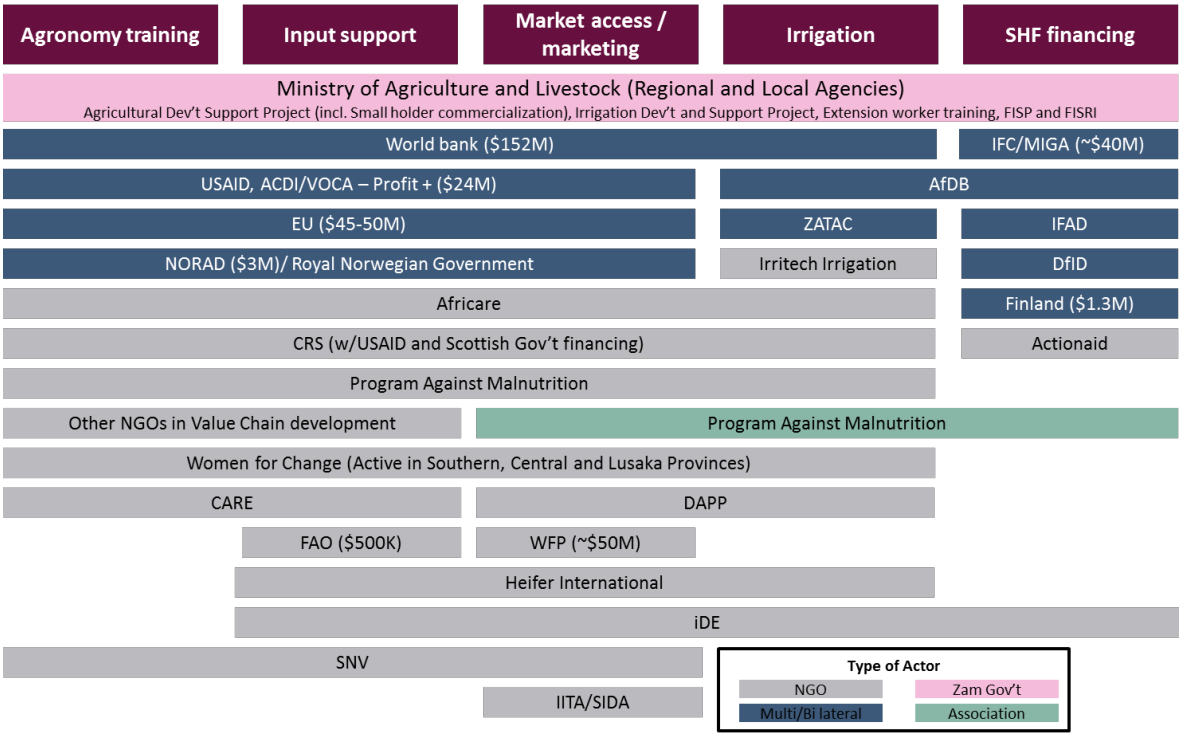
Major donors*	Engagement Description
EUROPEAN COMMISSION	• Fund the Conservation Agriculture Scaling Up (CASU) project through the FAO to increase crop production and productivity of over 300 000 small-scale farmers by promoting practices based on conservation agriculture. * EU funding commitment of $110M to support small holder farmer programs in Zambia
The MasterCard Foundation	• Disbursed over USD 300 million in agriculture and development across different African countries, including USD 50 million to fund innovate ideas for improving financial access and services for people in rural and agricultural regions
IFAD	• Currently providing USD 68.5 million funding to enhance smallholder farmer productivity and agribusiness, food safety and increased access to financial resources
Norad	• Fund the Conservation Farming Unit to to train farmers in climate-smart agriculture
SNV	• Support a range of projects to improve smallholder farmers' productivity through sustainable agricultural practices, agro-biodiversity, renewable energy technologies and improved access to input and services
USAID FROM THE AMERICAN PEOPLE	• Fund the Production, Finance, and Improved Technology Plus (PROFIT+) program and Feed the Future Mawa Project to work with smallholder farmers in Eastern province to improve smallholder productivity and diversification of agricultural practices, increase access to markets and trade, improve women involvement and private sector investment in agriculture
THE WORLD BANK	• Committed over USD 200 million to funding the Livestock Development and Animal Health Project, Community Markets for Conservation (COMACO) Landscape Management project, the Irrigation Development and Support Project, and the Zambia Water Resources Development Project
IFC	• Provided financing for large-scale commercial agriculture expansion and financing for business and management training for smallholder farmers
Sida	• Together with USAID, avail USD 8 million in private sector lending for renewable energy technologies and agricultural sector investment for farmers.
	• Granted a collective total of USD 87.12 million to support agriculture, climate change adaptation and capacity building for rural communities and livestock infrastructure development.
UKaid from the British people	• DFID has funded MUSIKA and the Financial Sector Deepening Programme Zambia (FSDZ) to leverage relationship between smallholder farmers and the private sector and improve financial inclusion respectively
	• Provide funding for sustainable agriculture, development of small-scale irrigation systems, increase in smallholder productivity and the Zambia National Farmers Union (ZNFU)

1.8. Other relevant stakeholders involved in AFA-related activities (agriculture and DFS)

Major government and parastatals bodies are involved in policy and regulation, research, information dissemination, and supply of inputs

Actor	Role
Ministry of Agriculture and Livestock	• Ministry of Agriculture, Livestock & Fisheries is tasked with regulating, providing resources to, and promoting agriculture; has overall management and governance of sector, and can cause material changes to the dynamics of the crops sub sector through legal changes, policy initiatives and regulations guiding operation and functioning of critical parastatals under the ministry's mandate
Zambia National Farmers Union	• Zambia National Farmers Union (ZNFU) is a national membership based organization, with countrywide coverage, representing the agriculture industry. Specifically ZNFU represent small and large scale farmers; and agribusinesses
ZARI Researching Soils, Crops and Water in Zambia	• The Zambia Agriculture Research Institute (ZARI) is the largest Agricultural research entity in the country. It has 10 research stations with Mt. Makulu Central Research Station Being the institutes Headquarters. The Institutes overall objectives is to develop and adapt crop, soil and plant protection technologies and to provide a high quality and cost effective service to farmers
Central Veterinary Research Station	• The Central Veterinary Research Institute (CVRI) is tasked with providing solutions to the livestock business in a changing environment through innovative veterinary services. The services provided include: The development of a quality management system and the development of a method for detection of antibiotic residues in meat
National Agricultural Information Services	• The National Agricultural Information Services (NAIS) is a specialized information wing of the Ministry of Agriculture and Livestock, whose main role is that of supporting the extension services of the ministry through the dissemination of agricultural information through the mass media
IAPRI	• The Indaba Agricultural Policy Research Institute (IAPRI) is Zambia's center of excellence in agricultural policy research and outreach in Zambia. The institute engages in applied agricultural policy analysis, capacity building and outreach to the sector

Zambia has a large number of stakeholders operating at every stage of the agriculture value chain offering opportunities for partnership



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