Ethiopian ATA
Agricultural Transformation Agency
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DIGITALLY ENABLED SERVICES FOR AGRICULTURE IN ETHIOPIA

Ecosystem Study Report

Dalberg Advisors

August 2019
Addis Ababa

This document reflects the findings of an eight-week ecosystem study covering the following sources

Stakeholder Interviews

- M-Birr
- Hello Cash
- Commercial Bank of Ethiopia (CBE)
- Apposit
- Digital Green
- Mercy Corps Ethiopia
- ACSI (Amhara Credit & Savings Institute)
- Ethio Telecom
- EthioChicken
- World Bank/IFC
- Oromia Insurance
- Heineken
- AGRA
- aWhere
- Awaaz.De
- CABI
- Ministry of Innovation and Technology (MINT)
- Dimagi
- PULA
- WFP
- Kifiya
- TechnoBrain
- LIC International

Desk Review

- Results of the 2012 ATA Baseline Survey
- Microfinance and Poverty Alleviation in Ethiopia
- LSMS—Integrated Surveys on Agriculture Ethiopia Socioeconomic Survey (ESS)
- Assessment of Transaction Pools For Digital Financial Services Sector in Ethiopia
- Opportunities and challenges for microinsurance: An analysis of the supply, demand and regulatory environment
- Ethiopia: National Financial Inclusion Strategy
- Ethiopia Credit pilot deep dive study
- Global Findex Database
- Central Statistical Agency Ethiopia Socioeconomic Survey 2015-2016
- Customer Due Diligence of Banks Directives No. SBB/46/2010
- Regulation of Mobile and Agent Banking Services Directives No. FIS /01/2012

Databases Compiled

- **Supply-side mapping** of financial and non-financial digital services and products in Ethiopia's agriculture space
- **Donor mapping** of bilateral, multilateral and NGO investments and programs

Primary and secondary research for the study was conducted through March and April 2019

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Glossary of terms

ACSI	Amhara Credit & Savings Institute	**MFI**	Microfinance institution
AdSCI	Addis Savings and Credit Institution	**MCIT**	Ministry of Communication & Information Technology
AGRA	Alliance for a Green Revolution in Africa	**MINT**	Ministry of Innovation & Technology
ATA	Ethiopian Agricultural Transformation Agency	**MNO**	Mobile Network Operator
ATM	Automated Teller Machine	**MoA**	Ministry of Agriculture
B2B	Business-to-business	**NBE**	National Bank of Ethiopia
B2C	Business-to-consumer	**OCSSO**	Oromia Credit and Saving Share Company
CBE	Commercial Bank of Ethiopia	**OMFI**	Omo Microfinance Institution
DECSI	Dedebit Credit and Savings Institution	**One stop shops**	Input centres run by the Agricultural Transformation Agency
DFS	Digital financial services	**POS**	Point of sale
ETB	Ethiopian birr	**PSNP**	Productive Safety Net Programme
FI	Financial institution	**RuSACCO**	Rural Savings and Credit Cooperative
G2C	Government-to-consumer	**SACCO**	Savings and Credit Cooperative
Idir	Traditional burial associations (informal insurance mechanism)	**SHF**	Smallholder farmer
Iqub	Informal rotating savings associations		

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Agenda

- Process update
- **Summary of the ecosystem assessment**
- Supporting material on the ecosystem assessment
- Emerging technology-driven innovation
- Appendix

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We have assessed the Ethiopian ecosystem across 3 pillars: enabling environment, SHFs' needs and solutions

Enabling Environment

- **Agriculture ecosystem:** Key agriculture sector stakeholders engaged in the ecosystem, including government players
- **Digital Infrastructure**
  - Network coverage by region
  - Agent network
- **Policy environment**
  - Is there an enabling regulatory environment for developing and launching digitally-enabled solutions
  - What policies are needed?
  - How important is digital and financial inclusion on the national agenda?
- **Investment landscape**
  - Volume of commercial, donor, and government funds raised to support digital solutions providers
  - Number of donors and investors with focus on agriculture and ICT space
  - Types of partnership

Smallholder Farmers' Needs

- **Access to Finance:** # of SHFs using financial products such as savings, loans, and insurance
- **Financial Literacy:** What financial literacy programs currently exist?
- **Digital Access**
  - Percentage/# of SHFs who own a mobile phone
  - Percentage/# of SHFs who use mobile money, mobile wallet, mobile savings & loans products
- **Digital Literacy**
  - Levels of digital literacy
  - What digital literacy programs currently exist?
- **Farmer Training: # / type of programs**
- **Farmer Aggregation**
  - Percentage/# of SHFs that are members of aggregator body1
  - Number of SHFs registered with non traditional financial providers1
- **Access to markets1**
  - Access to market information
  - Proximity to collection / storage points

Solutions – Supply-Side Landscape

- **Solution scope**
  - What financial and non-financial solutions are currently offered in market?
- **Solution scale and business model**
  - Number of solutions being provided at scale
  - Cost / pricing information of these solutions
  - What is the payment models of the solutions i.e., who pays for the service?
- **Delivery Channels**
  - Platform providers: number of bank branches ATMs, and POS terminals
  - Market actors: number of agro-dealers, input providers, buyers, and distributers
- **Alternative Data:** Where do the biggest opportunities lie?

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Enabling environment: Despite rapid network growth & gradual regulatory change, digital services remain nascent

Issue Area	*Key Findings*
Ag ecosystem	The **government** is the key player in the ecosystem, primarily driving productivity gains and operating **Africa's largest extension system**. **Donors** have historically been focused on funding and technical support. **Off-takers** (e.g. Heineken reaching 30k farmers) have focused on local sourcing
Digital infrastructure	**Network coverage and the cost of infrastructure have improved as enablers, but physical infrastructure and technological capacity remain key challenges** • Network coverage has improved strongly, now at ~90% of inhabitants up from ~10% in 2012, but there remains room to improve service quality • EthioTel's pricing has been reduced but is high vs. average incomes • Physical infrastructure remains the key barrier for SHFs to access financial services, information services, and market linkages • Low digital capacity amongst agents at key ag institutions (e.g. at co-operatives, FIs, and in the large national extension network)
Policy environment	**The policy environment remains restrictive, but shows signs of change** • Ethiopia has a bank-led model, with restrictions on account balances and transaction sizes; there are signs of recent change (e.g. rural borrowers can now use moveable assets as collateral, vs. urban property only) • However, the pipeline and timings for the changing regulatory environment is unclear, and meaningful changes that can benefit SHF at scale appear far off (e.g. licensing around banking agents) • Reinforcing technological capacity of extension system and cooperatives is an ongoing priority, but progress to date appears slow
Investment landscape	**The investment landscape in Ethiopia is nascent** • Ethiopia has relatively few emerging VCs and accelerators, and relatively few investors at the early stages of product/service development • High opportunity for more coordination amongst key players, including Ministry of Innovation & Tech, and private sector incubators • Many emerging ideas are donor-backed with relatively long pilot phases

Implications

- **Private sector** players have capability to serve SHFs, but need more **incentives** to do so over urban areas and are challenged by a **restrictive –albeit improving – enabling environment**
- **Longer-term engagement of key government stakeholders**, and Ethio Tel, is required for success
- **Focus is required** as initiatives will require significant effort
- There is **high opportunity for greater coordination** within the investment / accelerator landscape

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SHFs' needs: SHFs have low access to digitally-enabled services; physical infrastructure and trust are key barriers

Issue Area	*Key Findings*
Access to financial and non-financial services	**Access to finance and market linkages is generally low for SHFs** • Access to the financial services ecosystem is very low, with farmers typically relying on informal financial mechanisms*; formal financial services are dominated by general savings and loan products • Non-financial services are more developed in terms of provision and uptake, but current networks are not used by SHFs to their full potential — Ethiopia has an extensive national extension system and government-supported information services (e.g. 8028), but 90% of farmers use informal networks as their main source of information — There is low usage of improved inputs and limited market access
Digital access	**Digital access for SHFs is also very low** • Only 0.3% of the population has a mobile money account, vs. 73% in Kenya • Most MFIs operate key products in paper-based systems • Uptake of emerging mobile money systems is focused on peri-urban and urban areas – with the exception of G2C payments such as PSNP • Provision and uptake of digital non-financial services is also low
Barriers to uptake	**A variety of challenges prevent rural populations from accessing improved inputs, financial services and market linkages – both digital and non-digital** • Physical infrastructure, including access to roads, markets and co-ops • Reliability and trust of formal services (e.g. unexpected expenses) • Low awareness of services in rural areas • Digital literacy and familiarity with digital tools (of agents as well as SHFs) • Network infrastructure, including connectivity **SHFs are willing to pay for some services**, but if the SHF trusts the service and has clear evidence of economic payoff (potentially as part of a wider service bundle, e.g. Green Agro input provision + credit + information). However, there remains a **major gap vs. capacity to pay**

Implications

- **Tech applications** need to be **relatively basic** given current technical capability amongst SHFs (as well as agents in the extension network, at cooperatives, etc.)
- **Delivery channels/ tech service providers** should ideally be players already trusted by SHFs (as well as regional bureaus)
- Further work required to understand the **right bundles of services, and the right interface** for SHFs relative to specific services (e.g. human-centred design)

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* E.g. Idir (traditional burial associations which functions as an insurance mechanism) and iqub (informal rotating savings) – 58% of the rural population holds membership in idir.

Solutions: DFS remains nascent, with non-financial services more advanced, and opportunities around delivery / data

Issue Area	*Key Findings*
Financial services	**The scale of financial services is low, and supply is dominated by general loan products and government-led input loans and transactions** • The most commonly used financial services appear to be non-agricultural general loans offered by the 5 top MFIs, agricultural input loans offered by the ATA / MFIs / cooperatives, and G2C transactions • There is a supply gap around credit, savings and loans products that meet SHF-specific needs (e.g. non-input credit, flexible repayment options, etc.) • Services such as insurances are small-scale and largely donor-backed
Non-financial services	**Non-financial services have gained more traction, particularly info services** • Information services are dominated by government-led services (national extension services, ATA's 8028 farmer helpline, the national market information system, etc.) although there is some risk of duplication • There is a clear move towards digitization of info services for SHFs, and aggregation of data into a single hub (e.g. Digital Green consortium) • Supply chain and market access services are starting to emerge and require further support to grow given structural challenges, especially around DFS and overall digital capability
Delivery channels	**Service delivery to SHFs is often constrained by the reach and capacity of delivery channels that are often fragmented or lack capacity** • Ethio Telecom currently holds a monopoly and has substantial reach • High opportunity to improve reach / capacity of cooperatives, cooperative unions, MFIs and ATA's One Stop Shops as potential 'digital touchpoints'
Alter-native Data	**There is a wealth of existing data** within FIs, Ethio Tel, government players (including MoA and ATA), donor projects, and private sector players… **…but opportunities are likely longer term** given the enabling environment (including data protocols), and current level of digital capability in rural areas

Implications

- Within financial services, key **supply gaps** are around **digitally-enabled services tailored to SHFs**
- Within non-financial services, avoiding **duplication of effort** and ensuring **bundling of value-adding services** is critical to establish sustainable offerings
- Complex questions around **private sector vs. government ownership** of key services
- High opportunity for **cooperatives, cooperative unions and RuSACCOs** as a delivery channel but **capacity building** is required

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While constraints remain, there are opportunities for players to expand digital services within an evolving ecosystem

Constraints	Opportunities & Success Factors
Enabling Environment	
• Limited **digital capacity** in key ag networks (cooperatives, extension) • **High fragmentation** and **low coordination** • **Physical and network infrastructure** has improved, but remains a barrier to digital services uptake	1. Digital services could help overcome physical barriers to **reach Ethiopia's dispersed population** 2. **Longer-term engagement of government stakeholders** is required for success 3. **Focus and coordination** is required
Smallholder Farmer Needs	
• **Low access to digitally-enabled services**, and low availability of SHF-tailored financial products • **Key barriers** to using digital services include trust, awareness and literacy, and ability for services to suit Ethiopia's wide range of languages & contexts	1. **Tech applications need to be relatively basic** given current technical capability 2. **Delivery channels / tech service providers** should ideally be players already trusted by SHFs, with high rural reach (e.g. co-op unions)
Solutions	
• DFS **relatively limited beyond G2C transactions** • **Non-financial services have grown well** – primarily information services, with no market access and supply chain services at scale • **Last-mile delivery channels** are critical to unlock	1. Solving for **last-mile delivery channels**' reach and capacity is critical 2. Better **tailoring/bundling for SHFs** is required 3. Critical to **avoid duplication of effort** especially given high cost of local tailoring

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Key questions for other market actors to think about

Donors

1. Are there partnerships at senior level that can help overcome enabling environment challenges (e.g. driving coordination across players, and improving telecoms infrastructure as an enabler)?
2. What existing programs (government or private) can benefit from financial or technical assistance?
3. What efforts can lead to building greater familiarity and trust in digital services, especially in rural areas? (e.g. digital literacy programs)
4. How can donors help overcome the bottlenecks that limit uptake of digital-enabled services?

Investors

1. What investments in digital services are best placed to drive immediate and longer-term impact within Ethiopia's current enabling environment? With whom should we partner in Ethiopia?
2. How can you ensure attractive ROI in a nascent environment where many players think digitally-enabled solutions are most attractive if focused on urban areas?
3. Which value chains are ripe for commercial investment that show high benefits for SHFs?
4. How best can impact and benefit to SHFs be measured?

Government Bodies

1. How should government bodies coordinate to ensure efforts are complementary, not duplicative – with each other and with the private sector? Which government bodies should lead in which areas (e.g. capacity building in rural organizations, vs. data sharing protocols, vs. start-up incubation, etc.)?
2. How can government involvement help ease bottlenecks in the ecosystem, especially as relates to the enabling environment?

We have taken an ecosystem view of the agricultural / digital landscape to establish where market actors can add value

Not Exhaustive

Front-end Services

Financial

Credit

ACSI

Savings

RuSACCOs

Insurance

kifiya, eic

Transactions

helloCash, M-BIRR, Birr, kifiya, PAY

Non-Financial

Information Services

Digisoft Education, FARM RADIO INTERNATIONAL, yazmi, Intelligence

Supply Chain

Enveritas, apposit Terra Platform

Market Access

GebeyaNet, ECX, DEAMAT

Agricultural Market Actors

Buyers / Off-takers

Heineken

Input providers Cooperatives

SNV, Pure Planet, ethio chicken, care

Innovation Support & Accelerators

blueMoon, iceaddis, dot. ETHIOPIA, ANTLER, Startup Factory ETHIOPIA, iCog Labs, growthafrica, HUB ADDIS

Donors, Investors & NGOs

Donors & Investors

USAID, THE WORLD BANK, AGRA Growing Africa's Agriculture

Implementing NGOs

Digital Green, Precision Agriculture for Development, CABI

MNO

ethio telecom

Back-end Tech

apposit, TECHNO BRAIN, aWhere, kifiya, awaaz.de

Government Actors

MInT, የኢትዮጵያ ብሔራዊ ባንክ NATIONAL BANK OF ETHIOPIA, Jobs Creation Commission ETHIOPIA

Sources: Dalberg analysis, BriterBridges Tech Ecosystem Map (Q1 2019)

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The government is the key player in Ethiopia's agriculture ecosystem, although there are many other actors

Key Stakeholders	Role
Governance and Policy Ministry of Agriculture and Natural Resource Agricultural Transformation Agency Regional Governments	• Ministry of Agriculture and Natural Resources regulates and develops policy, provides training and promotes agriculture; Agricultural Transformation Agency is focused on improving the livelihoods of smallholder farmers; Regional Bureaus focus on policy implementation at a Regional level.
Market Actors Heineken, Fair Planet, ECX, SNV, ethio chicken, care	• These market actors provide the agricultural sector with inputs, access to domestic and international markets, as well as act as off-takers and middle men, aggregating output for markets.
Financial Actors ACSI, National Bank of Ethiopia, PAY, M-BIRR, helloCash, kifiya, Birr	• Financial actors in Ethiopia's agricultural sector are varied, including the National Bank of Ethiopia, government owned banks, sixteen private banks, microfinance institutions, insurance providers, mobile/agent banking providers, multilateral development banks and private firms.
Capacity Building Synergos, CABI, Digital Green, aWhere, FARM RADIO INTERNATIONAL, Precision Agriculture for Development, Intelligence, MInT	• Various government bodies, non-profit, and private sector groups focus on capacity building. The majority of actors work on bolstering access to markets and increasing access to extension and information services - mostly in specific regions and for specific value chains.
Research Community Ethiopian Institute of Agricultural Research (EIAR), International Food Policy Research Institute (IFPRI), IFAD	• Research organizations have operations in Ethiopia, many funded by international donors/NGOs. Like capacity building, research tends to be value chain or region specific.

Source: Dalberg analysis; Bitter Bridges Tech Ecosystem Map (Q1 2019); Financial Inclusion Strategy (2017)

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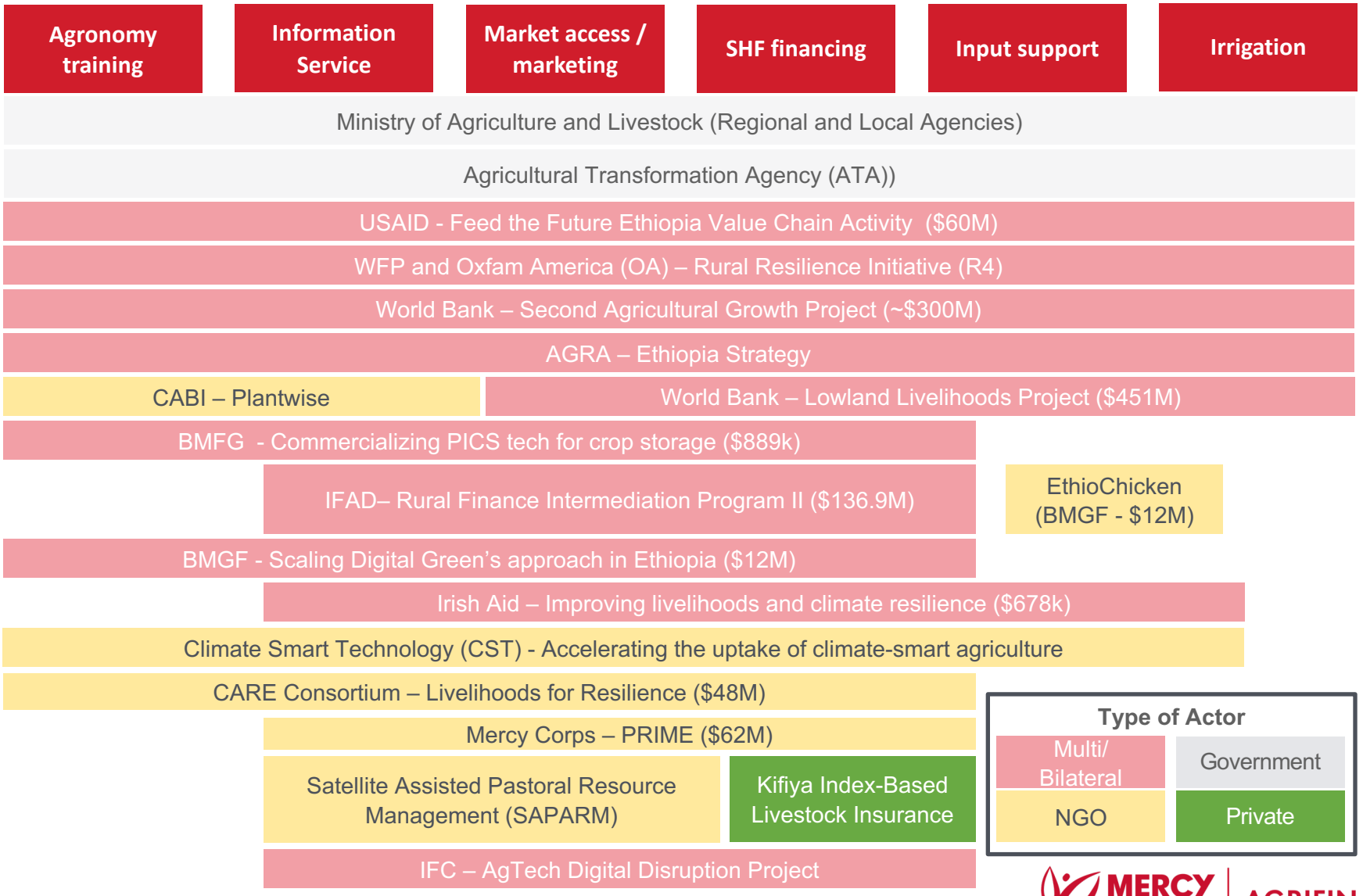
Much of the support in Ethiopia's agriculture ecosystem is from government players as well as donors



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**Non-exhaustive

Sources: Dalberg desk review; ATA agricultural investment mapping tool.

The government, donors and other players have typically focused on different activity areas within the ag ecosystem

Illustrative1

Donors (e.g. BMGF, UN WFP)

Example Areas	Selected Activities
Fund existing initiatives	e.g. AGRA funding of Second Growth & Transformation Plan
Pilot emerging innovations	e.g. WFP R4 index insurance for pastoralists
Provide technical assistance to partners	e.g. World Bank's Second Agricultural Growth Project (AGP2)

Government (e.g. MoA, ATA)

Example Areas	Selected Activities
Implement national strategy to increase productivity	e.g. MoA operating the national extension network
Manage access to inputs	e.g. Regional bureaus managing demand and supply of fertilizers
Drive commercialization of smallholder farmers	e.g. ATA Agricultural Commercialization Clusters for high-value commodities
Coordinate partners & projects	e.g. MoA running workshops linking private sector players in ICT for Ag Extension

Off-takers & other private sector players (e.g. Heineken)

Example Areas	Selected Activities
Digitize key systems for payment, supply chain mgmt. etc.	e.g. Heineken + Hello Cash payments trial
Provide technological systems to serve SHFs	e.g. Apposit tech for ATA's e-Vouchers and input tracking projects
Conduct projects to assess program impacts	e.g. Precision Agriculture for Development evaluation of 8028 hotline

1. The view provided is illustrative – areas listed are not exhaustive, and in fact there is significant overlap in activities between players (e.g. donors may also help coordinate partners and projects, but gov't players will typically take the lead).

Source: Government and donor websites; stakeholder interviews.

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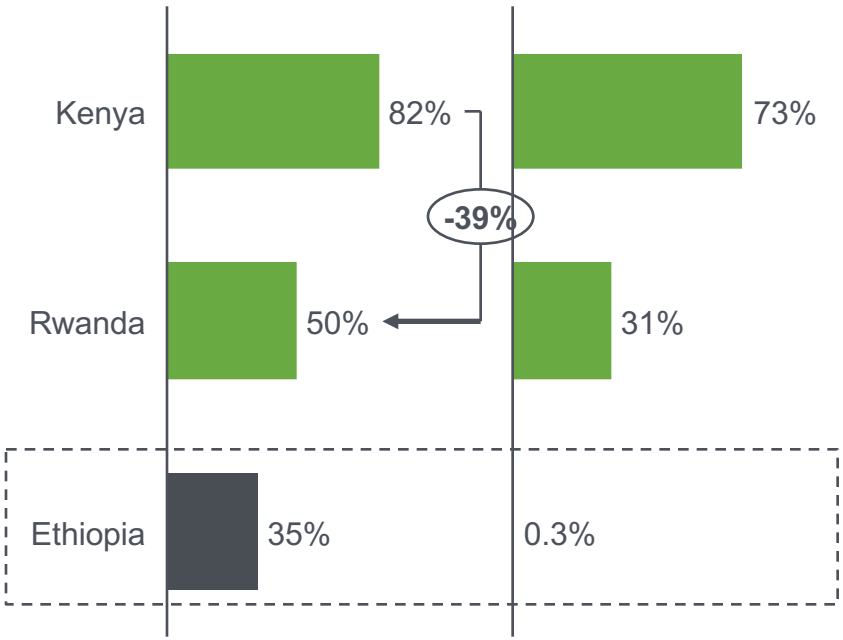
In Ethiopia, provision and uptake of financial / digital services remains nascent vs. other countries

Financial inclusion metrics by country
(% of population over 15)



Usage of digitally enabled services more generally is also low, given limited digital capacity at key farmer groups including co-operatives

Drivers of uptake of digitally enabled services

The following pages cover more detail on these drivers

1. **Infrastructure:** Network coverage in Ethiopia has improved, but remains a challenge alongside physical infrastructure and the cost of telecommunication services

2. **Policy Environment:** A relatively restrictive policy environment, with a bank-led system; some signs of recent change but key policy issues are unlikely to be resolved

3. **Investment Landscape:** Currently nascent, with some emerging start-ups but relatively limited in scale

Source: FINDEX report 2017.

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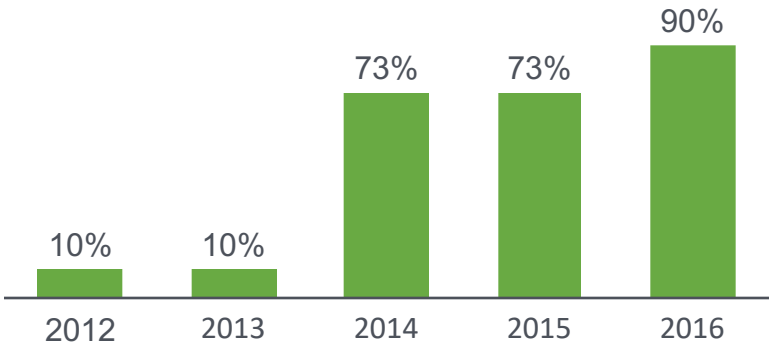
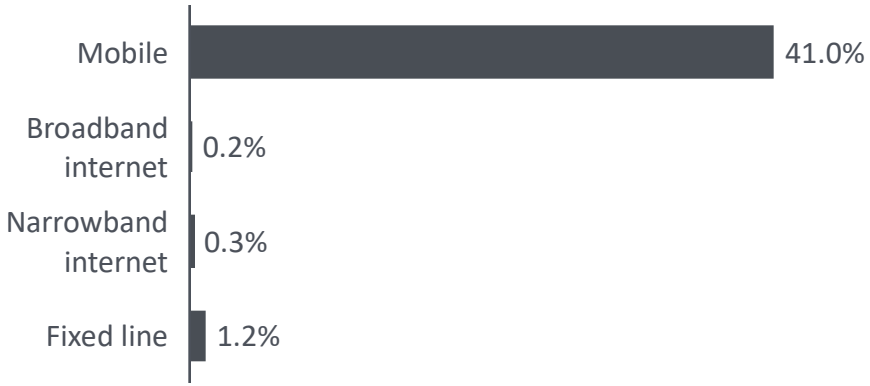
Despite strong improvement, digital infrastructure remains a challenge for development of services

Mobile network coverage
(% of inhabitants within range of a mobile cellular signal)



Telecommunication penetration rate
(% of inhabitants with subscription)



Structural challenges

- Ethio Telecom is a **state telecoms monopoly** with over 39.5 million mobile subscriptions (41% of inhabitants), and a **total of 41.1 million subscriptions**
- In recent years, Ethio Telecom has made substantial progress in network expansion and replacement projects
- This has led to **significant improvements in network coverage** across the country
- However, **quality of service** (including reliability and speed of connections) remains a challenge for developing digital services that benefit SHFs

Sources: International Telecommunication Union; Ethio Telecom; Stakeholder interviews; Dalberg analysis

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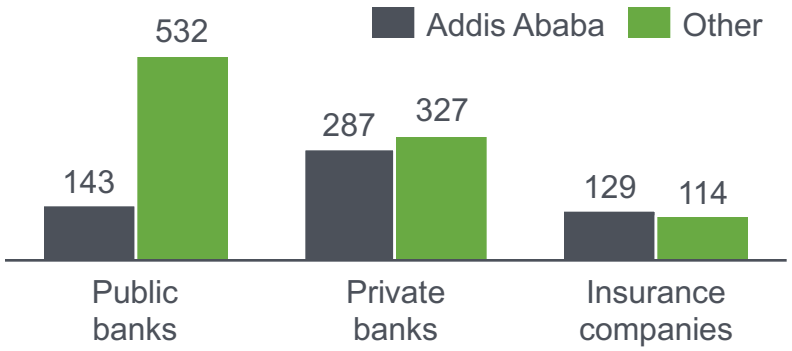
Physical infrastructure remains the biggest barrier for rural populations to access finance, information and markets

Physical access to financial services

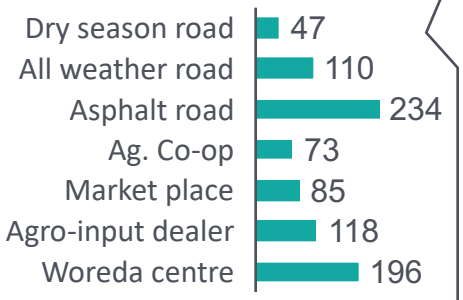
Distribution of financial institutions, 2011/2
(Number of branches)



- Low reach of FIs in rural areas is **one of the biggest barriers to SHFs' financial inclusion**
  - Although 97% of Ethiopia's population lives outside the capital, **Addis Ababa alone** has almost 50% of all private bank branches, 79% of public bank branches and over 50% of insurance branches
  - **~20%** of the financially excluded population mentioned the distance to FI branches / agents as their main barrier

Physical access to information & markets

Travel time from SHF house to roads & markets, 2012
(Minutes, n=3,000)



Caution – outdated data: Road infrastructure has improved dramatically (the proportion of rural people living within 2km of an all-season road improved from 32% to 57% from 2012 to 2016) – however, physical access remains a barrier

- Only **21% of smallholder production is marketed surplus**, partly due to physical infrastructure barriers
- **Long distances and limited physical infrastructure** limit access to markets
- As a result, 75% of transactions are conducted via **traders and brokers** – limiting SHFs' pricing power and access to information

Sources: World Bank data; Atlas world data; FINDEX report 2017; 2012 ATA baseline survey; Ethiopian Roads Authority Road Sector Development Program: 19 Years Assessment.

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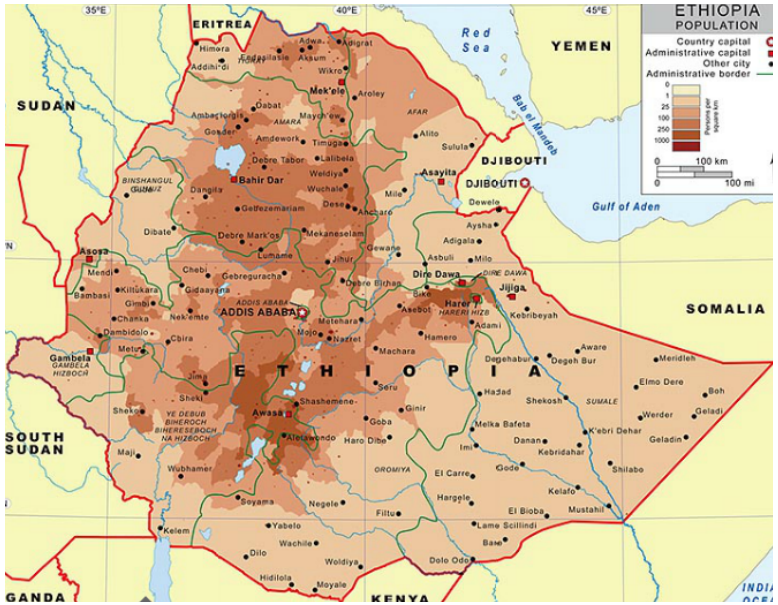
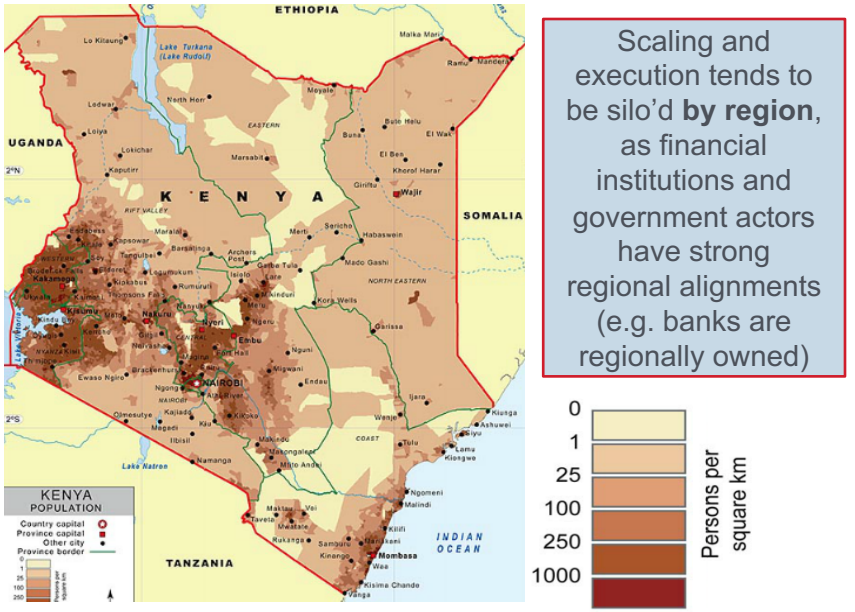
Digital services could bring substantial value to reach a population of Ethiopian smallholders that is relatively dispersed

Illustrative – data from 2007

Population density map for Ethiopia (2007)



Population density map for Kenya (2007)



Scaling and execution tends to be silo'd **by region**, as financial institutions and government actors have strong regional alignments (e.g. banks are regionally owned)

- Ethiopia's population is highly dispersed, with areas with 100-250 people per square km covering a relatively large percentage of the country's landmass
- This contrasts with Kenya, where the population is mostly concentrated in the western part of the country as well as peri-urban areas around Nairobi
- In addition, Ethiopia has a lower urbanization rate (~20%) than other countries in the region, such as Kenya (27%) and Tanzania (33%)
- Aa result, rural populations in Ethiopia are more difficult to reach through traditional physical sales points – **there is therefore high potential for digitally-enabled services to add value by helping to overcome physical and geographical challenges**

Sources: World Trade Press (Kenya; Ethiopia); World Bank data; Dalberg analysis

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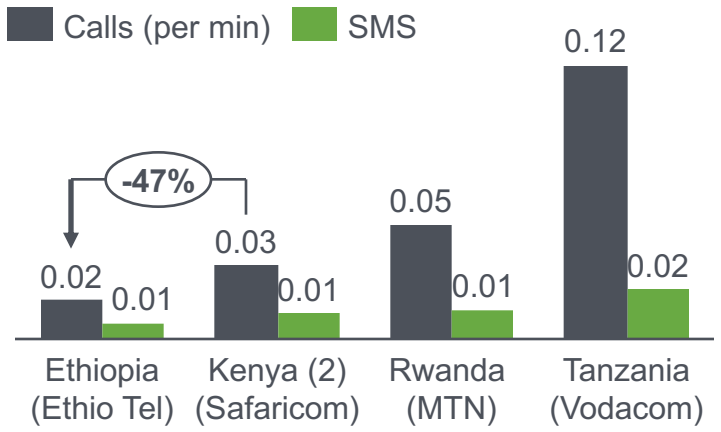
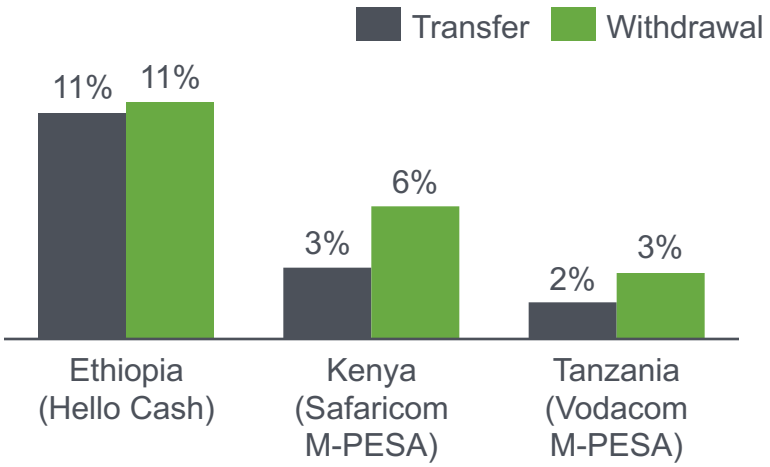
The cost of telecommunication services is competitive, however, the cost of digital financial services is relatively high

Cost of telecommunication services (1)
(USD/ min, USD/ SMS)



- In absolute terms, Ethio Telecom's services are **priced competitively** compared to other telecommunication service providers in the region
  - Call rates are 47% cheaper than Safaricom's rates and SMS rates are in line with other countries in the region
- In September 2018, Ethio Telecom **lowered tariffs** (40% for voice calls and 43% for SMS)

Cost of digital transactions for 10 USD
(USD per transaction as % of GDP per capita per day)



- Only 5% of unbanked people stated that the cost of services is one of their barriers
- However, the cost of DFS is high in the region. For example, transferring 10 USD with **Hello Cash costs 50% more than M-PESA** in Kenya
- This cost is even higher if we consider incomes per capita. The cost of a digital transfer of 10 USD (Hello Cash) is the equivalent of 10.9% of the GDP per capita per day, compared to 3.4% in Kenya and 1.8% in Tanzania (M-PESA)

(1) The rates for Rwanda, Tanzania and Kenya are rates within the network, off-network rates are generally higher. The exchange rates used are from April 8th 2019. The call tariff is an average of the day & night tariffs

Sources: Ethio Telecom, Safaricom Kenya, MTN Rwanda, Vodacom Tanzania, Cooperative Bank of Oromia

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Ethio Telecom is undergoing a transformation process that could drastically alter the digital landscape

Ethio Telecom transformation process

1. **Creation of a separate and independent regulatory body:**
   - Mandated to license new entrants, regulate competition and manage tariffs

2. **Asset valuation:**
   - Ethio Telcom is undergoing an asset valuation process that could lead to divestment of up to 49%

3. **Split of Ethio Telecom into separate companies for infrastructure and service provision:**
   - Ethio Tel will split into two units to spur competition
   - There are indications that that the restructuring could lead to the introduction of new financial service offerings

4. **Spectrum Sale:**
   - Shares of between 30-40% will be sold to both domestic and foreign investors, but no market entry of separate players (with players like Kenya's Safaricom, South Africa's MTN and France's Orange showing)

At time of writing, stages 1 and 2 are complete and stages 3 and 4 are in progress

Sources: Dalberg Analysis, Stakeholder Interviews

The policy environment for DFS relatively restrictive: a bank-led model with constraints on transactions & agent onboarding

Bank-led model

- Only NBE-licensed financial institutions (banks and MFIs) can offer mobile banking services
- The Banking sector is extremely concentrated, with the Commercial Bank of Ethiopia (CBE) holding half of bank deposits and more than half of loans

Banking restrictions

- There are limits on transaction and account balances (ex. maximum balance in mobile account of 25,000 ETB, maximum daily debit of 6,000 ETB). While this might not be a significant barrier for smallholder farmers, it potentially constrains larger market players from switching to digital financial services (ex. bulk payments)
- Remittances have to go through financial institutions and cannot be transferred via mobile money
- Debates within government could see the bank-led model open up to fin-techs and other financial providers in the next few months

Agent recruitment

- The NBE sets strict restrictions on the recruitment of banking agents, which limits mobile money and agent banking networks: agents must have an established business/commercial entity prior to becoming an agent and must show evidence of a valid permit, police certificate of good conduct, and evidence of prior commercial activity/funds to cover agent operations.

National ID system

- Ethiopia still does not have a digital national identification card (ID) system, and many people in rural areas lack the necessary documentation to open accounts or use financial services

Sources: Stakeholder interviews; Dalberg analysis; Regulation of Mobile and Agent Banking Services Directives No. FIS /01/2012

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Despite some recent changes, it is unlikely that key policy issues (for FS) will be resolved in the near future

There have been recent positive changes to the policy environment

- Increasing access to financial services is a **priority for the Ethiopian government**
- The government launched a **National Financial Inclusion Strategy (NFIS)** in 2017. One of the key goals of this strategy is to increase account ownership to 60% in 2020
- Simultaneously, a new **Financial Inclusion Secretariat** was formed to deliver on this strategy, and is housed within the supervisory National Bank of Ethiopia (NBE)
- Some policy changes have already been implemented – fintech players have mentioned potential changes such as:
  - Allowing **moveable assets to be used as collateral** (e.g livestock)
  - Allowing a wider range of players beyond banks and MFIs to enter the fintech space

However, key policy issues are unlikely to be resolved in the short term

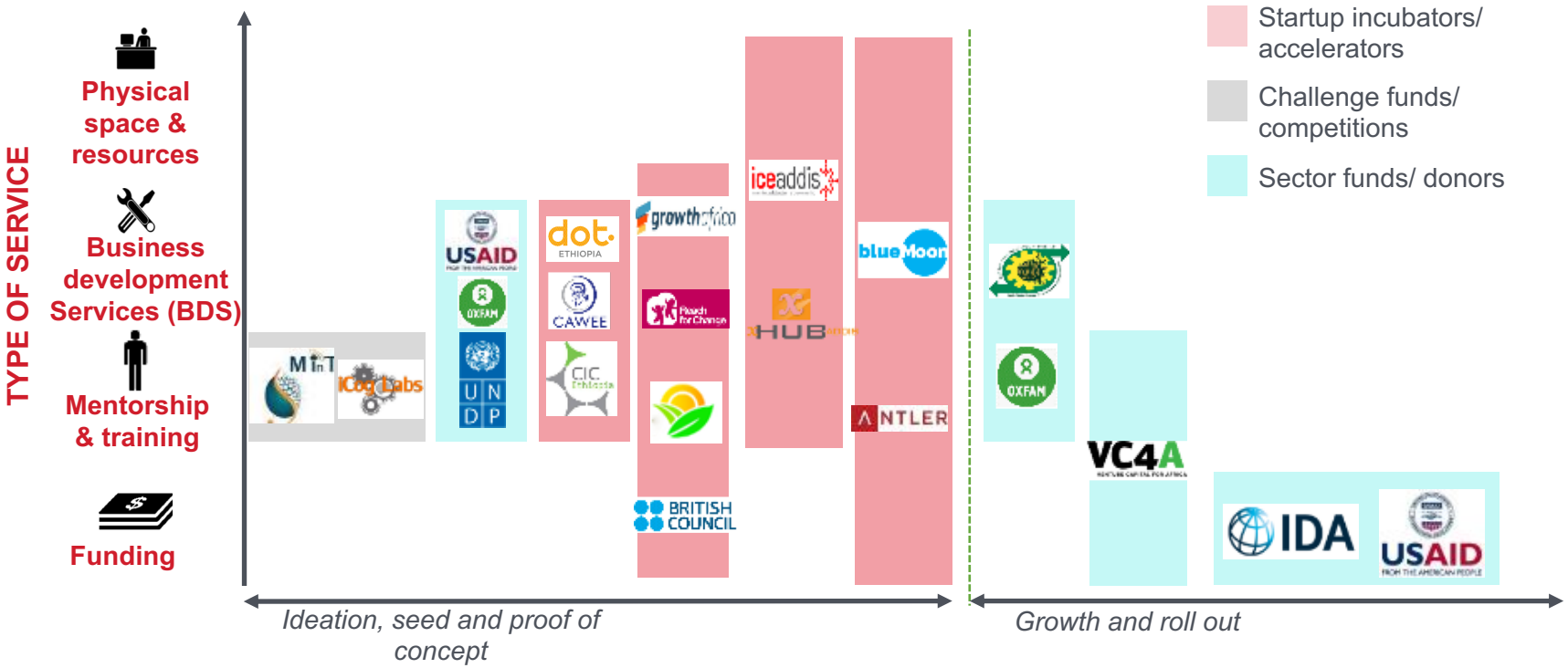
- Despite the progress that has been achieved, and the government's willingness to address financial exclusion, several issues remain unsolved
- For example, the financial inclusion secretariat embodies both the role of enabler and regulator which creates some tensions
- There are also strict restrictions for hiring mobile banking agents (e.g. requirement to be a business owner, restrictions on marketing activities, number of documents required), which limits the reach of financial institutions
- In addition, the scaling of digital services is still limited by the absence of a national digital ID. In fact, ~15% of the financially excluded population mentioned the lack of required documentation as their main barrier

Source: Stakeholder interviews; Regulation of Mobile and Agent Banking Services Directives No. FIS /01/2012.

The investment landscape in Ethiopia is nascent

- Most incubators, accelerators and challenge funds within Ethiopia **focus on the seed, proof of concept stage**
- Most sources of **funding for start-ups are available through business model competitions**, **while incubators and accelerators source their funding from donors**

Incubator and funding models based on stage of maturity and type of service*



* Non-exhaustive

Sources: Stakeholder interviews; service provider websites; British Council

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The number of service providers supporting start-ups and emerging businesses is relatively limited

Type of Service	Description	Notable Players
Accelerators & Incubators	• **Funding**: Provide seed level funding for early stage high potential technology startups • **Mentorship and training:** Provide mentorship and training through experts in the field • **Physical space and resources:** Startups are housed in the accelerator space • **Business development services:** Provide BDS services as part of the program	blueMoon, iceaddis, xHUB ADDIS, ANTLER
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	MInT, iCog Labs
Sector Donors	• **Funding**: Provide grant funding for established businesses as well as 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	USAID, IDA

* Non-exhaustive

Sources: Stakeholder interviews; service provider websites; British Council

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We have assessed the Ethiopian ecosystem across 3 pillars: enabling environment, SHFs' needs and solutions

Enabling Environment

- **Agriculture ecosystem:** Key agriculture sector stakeholders engaged in the ecosystem, including government players
- **Digital Infrastructure**
  - Network coverage by region
  - Agent network
- **Policy environment**
  - Is there an enabling regulatory environment for developing and launching digitally-enabled solutions
  - What policies are needed?
  - How important is digital and financial inclusion on the national agenda?
- **Investment landscape**
  - Volume of commercial, donor, and government funds raised to support digital solutions providers
  - Number of donors and investors with focus on agriculture and ICT space
  - Types of partnership

Smallholder Farmers' Needs

- **Access to Finance:** # of SHFs using financial products such as savings, loans, and insurance
- **Financial Literacy:** What financial literacy programs currently exist?
- **Digital Access**
  - Percentage/# of SHFs who own a mobile phone
  - Percentage/# of SHFs who use mobile money, mobile wallet, mobile savings & loans products
- **Digital Literacy**
  - Levels of digital literacy
  - What digital literacy programs currently exist?
- **Farmer Training: # / type of programs**
- **Farmer Aggregation**
  - Percentage/# of SHFs that are members of aggregator body1
  - Number of SHFs registered with non-traditional financial providers1
- **Access to markets1**
  - Access to market information
  - Proximity to collection / storage points

Solutions – Supply-Side Landscape

- **Solution scope**
  - What financial and non-financial solutions are currently offered in market?
- **Solution scale and business model**
  - Number of solutions being provided at scale
  - Cost / pricing information of these solutions
  - What is the payment models of the solutions i.e., who pays for the service?
- **Delivery Channels**
  - Platform providers: number of bank branches ATMs, and POS terminals
  - Market actors: number of agro-dealers, input providers, buyers, and distributers
- **Alternative Data:** Where do the biggest opportunities lie?

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SHFs' needs: SHFs have low access to digitally-enabled services; physical infrastructure and trust are key barriers

Issue Area	*Key Findings*
Access to financial and non-financial services	**Access to finance and market linkages is generally low for SHFs** • Access to the financial services ecosystem is very low, with farmers typically relying on informal financial mechanisms*; formal financial services are dominated by general savings and loan products • Non-financial services are more developed in terms of provision and uptake, but current networks are not used by SHFs to their full potential — Ethiopia has an extensive national extension system and government-supported information services (e.g. 8028), but 90% of farmers use informal networks as their main source of information — There is low usage of improved inputs and limited market access
Digital access	**Digital access for SHFs is also very low** • Only 0.3% of the population has a mobile money account, vs. 73% in Kenya • Most MFIs operate key products in paper-based systems • Uptake of emerging mobile money systems is focused on peri-urban and urban areas – with the exception of G2C payments such as PSNP • Provision and uptake of digital non-financial services is also low
Barriers to uptake	**A variety of challenges prevent rural populations from accessing improved inputs, financial services and market linkages – both digital and non-digital** • Physical infrastructure, including access to roads, markets and co-ops • Reliability and trust of formal services (e.g. unexpected expenses) • Low awareness of services in rural areas • Digital literacy and familiarity with digital tools (of agents as well as SHFs) • Network infrastructure, including connectivity **SHFs are willing to pay for some services**, but if the SHF trusts the service and has clear evidence of economic payoff (potentially as part of a wider service bundle, e.g. Green Agro input provision + credit + information). However, there remains a **major gap vs. capacity to pay**

Implications

- **Tech applications** need to be **relatively basic** given current technical capability amongst SHFs (as well as agents in the extension network, at cooperatives, etc.)
- **Delivery channels / tech service providers** should ideally be players already trusted by SHFs (as well as regional bureaus)
- Further work required to understand the **right bundles of services, and the right interface** for SHFs relative to specific services (e.g. human-centred design)

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* E.g. Idir (traditional burial associations which functions as an insurance mechanism) and iqub (informal rotating savings) – 58% of the rural population holds membership in idir.

Smallholder farmers make up the majority of farmers and total production, and farm primarily for subsistence

Smallholder Farms	Commercial Farms
SHFs make up 95% of the total farmers (13m SHFs) **and produce 90% of output**	**Commercial farms make up 5%** of the total farmers in Ethiopia
62% of income from crop production	**74% of income from crop production**
12 million Ha of cultivated land	461,000 Ha Cultivated land
0.78 Ha of average landholding	**3.23 Ha of average landholding**
Mostly traditional practices (labor intensive, low input)	Mostly modern agricultural practices (improved inputs and mechanization)
Marketed Surplus – 21%	**Marketed Surplus – 100%**

Less than 8% of SHF income is generated from non-agricultural wages or self-employment

SHFs generate a gross annual average income of about USD 1246

3.5 percent of smallholder farm income is supplemented by PSNP

2% of the arable land of a smallholder is irrigated

Average annual credit borrowed is USD 58 which only covers 2% of value of production

3.7% of SHFs have access to agricultural machinery

** Based on FAO definition of Ethiopian SHFs: average farm size of less than one hectare and 2 Tropical Livestock Units (FAO 2015)

Sources: FAO (2015); UNDP ETHIOPIA, An assessment of Operation and performance of commercial farmers in Ethiopia, 2013; IFPRI, Crop Production in Ethiopia: Regional Patterns and Trends, 2012; Central Statistical Agency.

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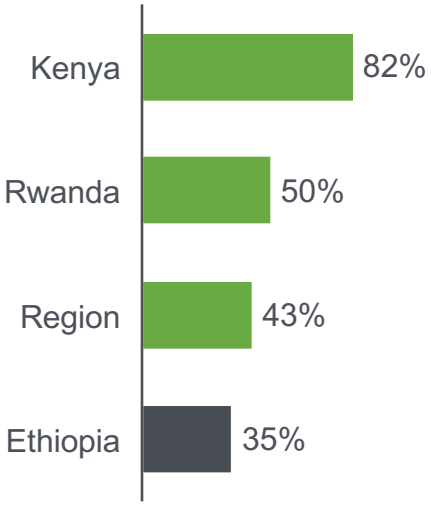
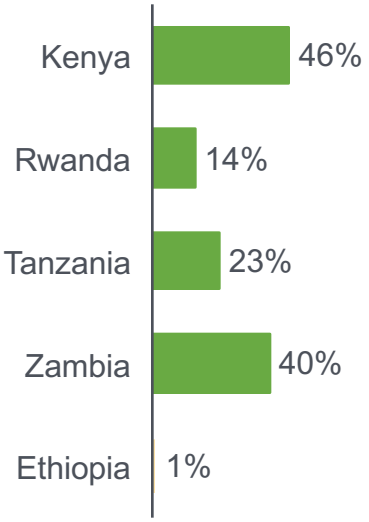
Access to financial services lags behind the region, and is especially low for the rural population and women

Financial inclusion metrics by country, 2017 (Findex)

Account ownership (% of population over 15)



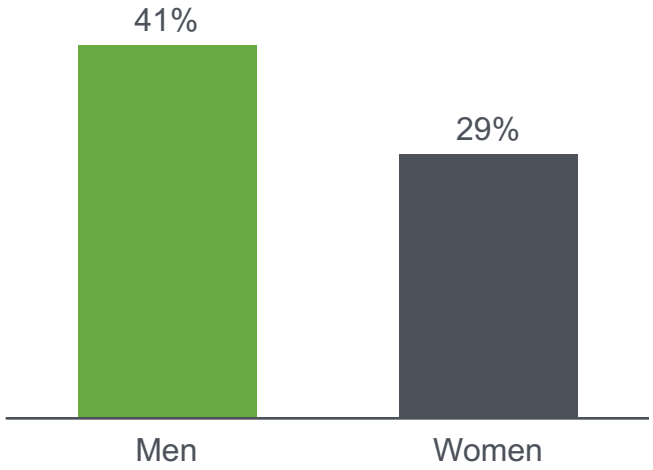
Use of accounts for agricultural payments (% of recipients)



Although Ethiopia has achieved **considerable progress** in financial inclusion, it still **lags behind other countries in the region**. The percentage of Ethiopians who have bank accounts has increased from 22% to 35% from 2014 to 2017, but this rate is still below the regional average

Financial inclusion by gender, 2017 (Findex)

Account ownership (% of population over 15)



Women have lower rates of financial inclusion than men and have seen slower progress: from 2014 to 2017, account ownership increased from 23% to 41% for men, vs. only 21% to 29% for women.

In addition, government sources (CSA) show significant **disparity between urban and rural populations**. In 2015, 11% of the rural population had an account, vs. 21% of urban people *(NB: CSA data used rather than Findex)*

Sources: FINDEX 2017 report; CSA 2015.

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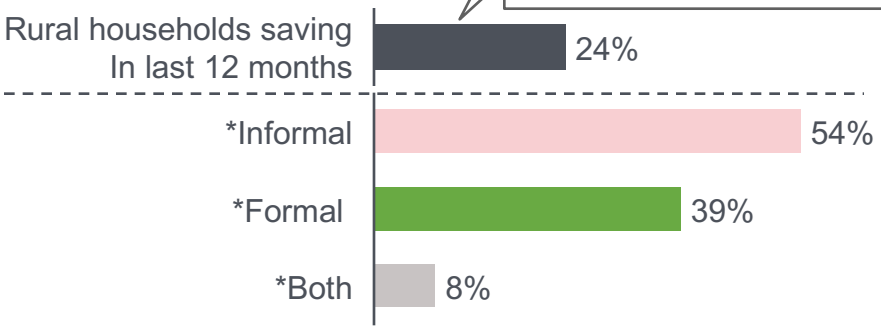
As a result, farmers meet their financial needs largely through informal mechanisms

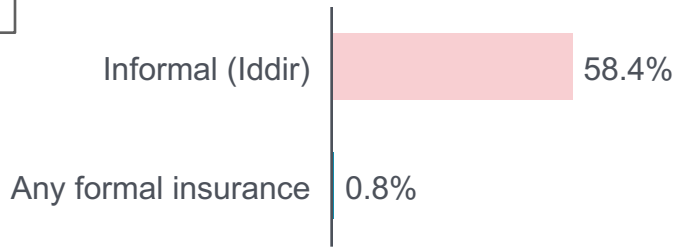
Preference of methods of saving
(% of population over 18)

Savings overwhelmingly for emergencies (82% of rural population who are saving) – next most common reason is asset building (9%)

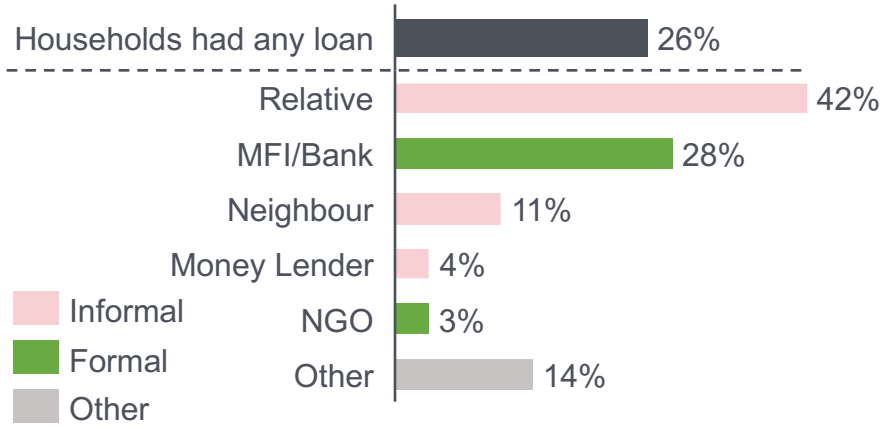


*Percentage of total rural savings

Main methods of insurance in rural population
(of rural population over 18)



Main methods of borrowing by loan source
(of rural population over 18)



Key takeaways

The uptake of formal financial services in rural areas is low compared to informal services across savings, credit and insurance.

- Total percentage of **rural savings is particularly low (24%) when compared to 67% who save in Addis Ababa.**
- The main reason cited for **not using formal insurance was lack of understanding (49%)**
- The most frequently cited reason for taking out a **loan in rural areas was to purchase agricultural inputs.**

* Of national population who are saving, rather than rural only

Source: Central Statistical Agency Integrated Surveys on Agriculture Ethiopia Socioeconomic Survey (2015-2016).

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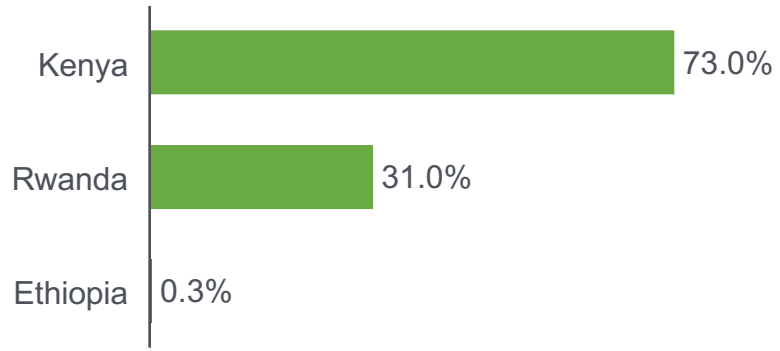
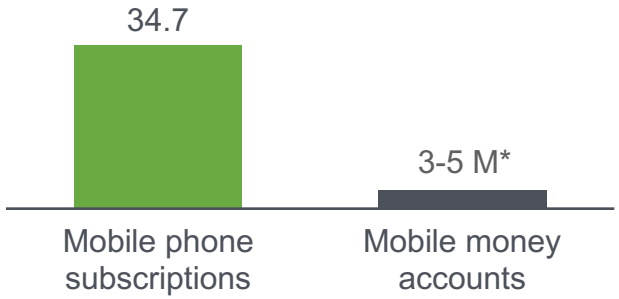
Digital access for smallholder farmers is also very low, and typically associated with government-led programs (e.g. PSNP)

Prevalence of mobile money accounts (Findex)
(% of population over 15)



Phone subscriptions vs. mobile money accounts

(Number of accounts in millions)



Overview of digital access

- Ethiopia lags behind other countries in the region in terms of mobile money usage and mobile money account ownership, in both urban and rural areas
- **Ethiopia remains an overwhelmingly cash-based economy.** Almost all (99%) adults pay utility bills with cash, compared to 12% of people in Kenya and 59% in the region
- **Usage of digital services remains low despite improvements in mobile phone ownership** and network coverage. Out of 34.7 million mobile subscribers, about 13 million mobile phone owners are unbanked
- While the supply of digital services to rural areas is limited, **uptake is also constrained by demand-side factors**. Usage of digital financial services in rural areas is dominated by PSNP e-payments. However, most recipients do not use their accounts for other services beyond receiving payments (with some exceptions e.g. in Somali region which sees high levels of remittance)

* Estimate based on bottom-up methodology from datapoints in stakeholder interviews; does not align with Findex statistic of 0.3% of population which are based on survey results
Sources: FINDEX 2017 report; stakeholder interviews.

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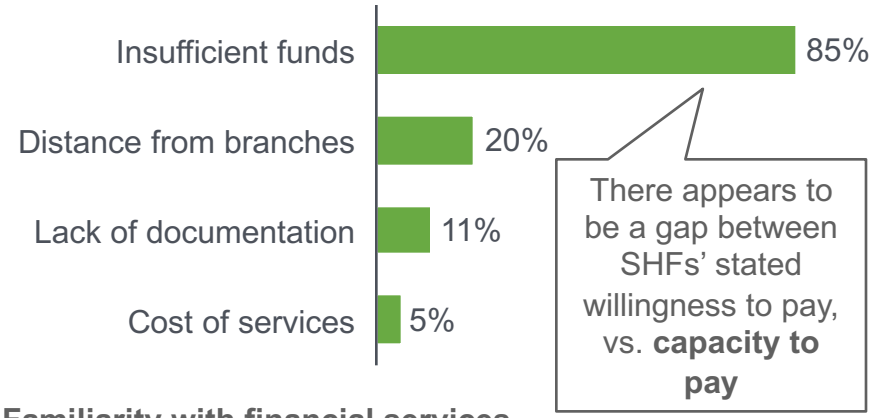
The main barriers to uptake of formal financial products are insufficient funds, accessibility, familiarity and trust

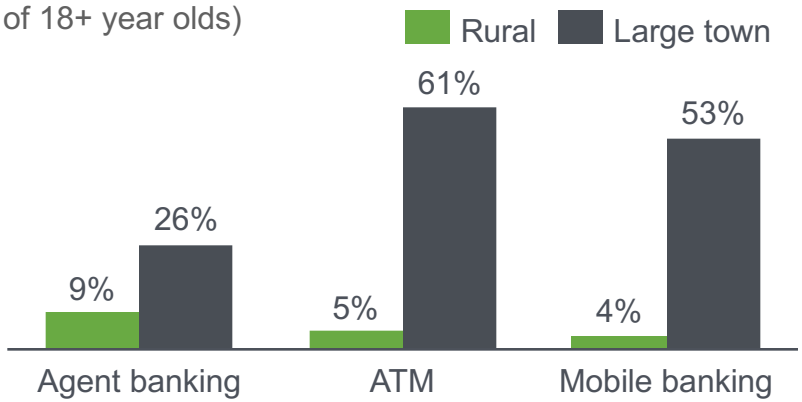
Stated barriers to uptake of financial services

(% of unbanked adults)



Familiarity with financial services

(% of 18+ year olds)



Overview of the key barriers

- The key barriers for financial inclusion include the **perception of having insufficient funds** (distinct from unwillingness to pay), **distance from financial institution branches** and agents (due to low penetration in rural areas), and lack of required **documentation**.
- Rural populations are also significantly less likely to be **familiar with financial services** than urban populations. For instance, only 4% of rural people are familiar with mobile banking, compared of 53% of urban people
- In addition, many people **lack trust in financial services** and perceive them as unreliable
  - 62% of rural people reported being worried about **unexpected expenses** linked to their accounts
- Other challenges include low literacy and digital literacy, whilst the **cost of services** is a much less significant barrier

Sources: FINDEX 2017 report; Central Statistical Agency Integrated Surveys on Agriculture Ethiopia Socioeconomic Survey (2015-2016).

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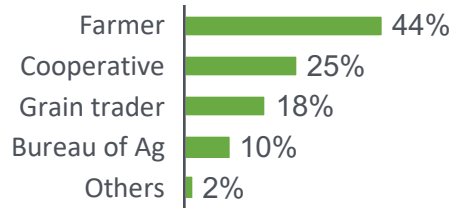
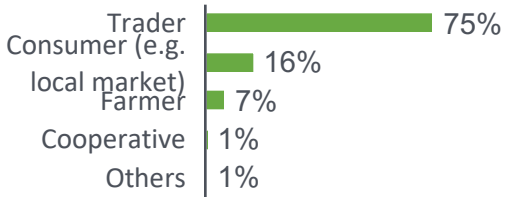
Farmers access inputs, information and markets via a range of sources; physical barriers and personnel gaps remain key

	Input Purchase	Information Access	Market Access
Current Needs & Access	• **Improved seeds** usage is relatively low (~31% of fields with maize, ~8% of wheat ~3% of teff, as of 2015/16) while **fertilizer** application is well below other countries (~20kg per hectare vs. ~80 per hectare in Kenya) • **Other farmers** and **cooperatives** are the primary sources of seed purchase: **Sources of purchased seed in Ethiopia, 2012** (% of sales. n=2,087) 	• **90%** of farmers rely primarily on **informal social learning** (from other farmers, friends and relatives) as opposed to public extension services • Formal access to ag information is primarily through the **national extension system** –the largest in Africa with over 50k extension agents (~3 per kebele, or ~21 per 10k farmers) • **Participatory extension system** introduced by MoA in 2010 – underpinned by farmer groups (e.g model farmers showing techniques to groups of five other farmers) • Other sources include supplementary services e.g. 8028 hotline	• Only 21% of SHF production is **marketed surplus** (vs. ~23% in Kenya, ~38% in Vietnam) • Market transactions are primarily **via traders**, given long travel times to markets and cooperatives (~1 hour avg.) • Amongst farmers overall, <2% of sales transactions are **under contract** (2012) **Main buyers of crop, 2012** (% of sales. n=5,451) 
Key Barriers	• Limited **distribution networks** – all planning & supply via government and co-op networks • **High tariffs** on improved inputs • SHFs' ability to afford inputs at the times they are needed given **seasonal incomes**, compounded by **limited access to finance**	• **Low ICT** capacity and usage • **Insufficient consideration for SHFs' needs** in extension design – **complex stakeholder environment** • Low motivation and high churn of **development agents** (given low pay, high workload) limiting ability to **improve training**	• **Physical infrastructure** – long distances to travel to roads, marketplaces or agricultural co-ops • **Limited pricing power**, due to power imbalance vs. **brokers and aggregators** as well as **limited information**

Source: 2012 ATA Baseline Survey; Central Statistical Agency 2015/16 Socio-Economic Survey; Gerba Leta, "The Ethiopian Agricultural Extension System", 2018.; FAO Smallholder Farmers' DataPortrait; MoA Agricultural Extension Strategy, 2017.

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SHFs are willing to pay for some digital services, including information services, if financial value-add is clear

Key drivers of willingness to pay for digital services

Service type	• Higher willingness to pay for information or market linkage services that **show a direct linkage to income uplift and/or are in value-adding bundles** — 90% of SHFs who aren't currently willing to pay for services would pay, if guaranteed an income increase — SHFs show willingness to pay for financial services (e.g. credit, insurance), and information bundled with finance (e.g. Green Agro / Techno Brain input finance + information) — Farmers are willing to pay for Apposit's market information service as income trade-offs are very clear (cost of calls vs. higher pricing and savings on travel)
Quality and trust of providers	• Findings show that there is often a **willingness to pay** yet farmers often lack the **capacity to pay** • Farmers often show initial unwillingness to pay when services are not yet **trusted** – as shown by ATA 8028 experience, and Techno Brain experience in other countries with info services • Services need to be in **local languages and vernacular** and **easy to understand** – high variation across regions in Ethiopia creates an additional challenge
Crop type	• Farmers are more willing to pay for services that increase value from **cash crops**
Payment modality	• Over 90% of farmers prefer to **pay for services in farmer groups or cooperatives**

There is evidence that **value-adding** bundles, as well as **group payment**, can substantially drive willingness to pay. However, given SHF income levels, capacity to pay and impact objectives, it may be preferable to keep services **free at point of use** and drive sustainability via other value chain players (cf. DigiFarm)

Sources: Stakeholder interviews; "Determinates of SHF WTP for extension services" African Journal of Agricultural Research; Enterprise Partners "Assessment of Transaction Pools For DFS Sector in Ethiopia"; Dalberg analysis.

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We have assessed the Ethiopian ecosystem across 3 pillars: enabling environment, SHFs' needs and solutions

Enabling Environment

- **Agriculture ecosystem:** Key agriculture sector stakeholders engaged in the ecosystem, including government players
- **Digital Infrastructure**
  - Network coverage by region
  - Agent network
- **Policy environment**
  - Is there an enabling regulatory environment for developing and launching digitally-enabled solutions
  - What policies are needed?
  - How important is digital and financial inclusion on the national agenda?
- **Investment landscape**
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  - What digital literacy programs currently exist?
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  - Market actors: number of agro-dealers, input providers, buyers, and distributers
- **Alternative Data:** Where do the biggest opportunities lie?

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Solutions: DFS remains nascent, with non-financial services more advanced, and opportunities around delivery / data

Issue Area	*Key Findings*
Financial services	**The scale of financial services is low, and supply is dominated by general loan products and government-led input loans and transactions** • The most commonly used financial services appear to be non-agricultural general loans offered by the 5 top MFIs, agricultural input loans offered by the ATA / MFIs / cooperatives, and G2C transactions • There is a supply gap around credit, savings and loans products that meet SHF-specific needs (e.g. non-input credit, flexible repayment options, etc.) • Services such as insurances are small-scale and largely donor-backed
Non-financial services	**Non-financial services have gained more traction, particularly info services** • Information services are dominated by government-led services (national extension services, ATA's 8028 farmer helpline, the national market information system, etc.) although there is some risk of duplication • There is a clear move towards digitization of info services for SHFs, and aggregation of data into a single hub (e.g. Digital Green consortium) • Supply chain and market access services are starting to emerge and require further support to grow given structural challenges, especially around DFS and overall digital capability
Delivery channels	**Service delivery to SHFs is often constrained by the reach and capacity of delivery channels that are often fragmented or lack capacity** • Ethio Telecom currently holds a monopoly and has substantial reach • High opportunity to improve reach / capacity of cooperatives, cooperative unions, MFIs and ATA's One Stop Shops as potential 'digital touchpoints'
Alter-native Data	**There is a wealth of existing data** within FIs, Ethio Tel, government players (including MoA and ATA), donor projects, and private sector players… **…but opportunities are likely longer term** given the enabling environment (including data protocols), and current level of digital capability in rural areas

Implications

- Within financial services, key **supply gaps** are around **digitally-enabled services tailored to SHFs**
- Within non-financial services, avoiding **duplication of effort** and ensuring **bundling of value-adding services** is critical to establish sustainable offerings
- Complex questions around **private sector vs. government ownership** of key services
- High opportunity for **cooperatives, cooperative unions and RuSACCOs** as a delivery channel but **capacity building** is required

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We have evaluated products on level of development, based on the following indicators

Indicator	*Description*
Number of products / service providers	• This indicator considers the number of digital and non-digital financial products (e.g. credit, insurance) / service providers (e.g. commercial banks, NGOs) • A higher number of products / service providers indicates a higher level of accessibility and availability of the product to individuals and businesses
Appropriate product / service design for SHFs	• This indicator considers the suitability of the financial product or service for a smallholder farmer – does the product or service have features that are well-tailored to smallholder farmers' need? Does it provide the flexibility smallholder farmers need?
Delivery channel feasibility of reaching SHFs	• This indicator considers the accessibility of the financial product or service for a smallholder farmer, in terms of the provider / delivery channel's footprint and economics. How easily will the product reach smallholder farmers and is it easily accessible (distance, technology)? How do the provider economics impact the ability, and sustainability, of reaching smallholder farmers?
Digital capability or potential	• This indicator considers the use of digital platforms to operationalize the financial products and services provided. This influences mass accessibility of products • Products with digital capability would be ranked higher on level of development

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Summary of our emerging view by product type

Level of Development

Financial Products	Credit	Well-developed relative to other categories, but dominated by input credit products. Gaps remain in terms of product diversity (non-input credit), with barriers to scaling including limited reach of branches / agents, shortages of personnel, suitable collateral, and low levels of liquidity
	Savings	Primarily traditional products from RuSACCOs and MFIs and limited offer of ag-specific products. Some emerging mobile money players with limited rural uptake, given strong demand-side barriers, as well as limited reach and regulatory challenges
	Insurance	Remains nascent, with many programs remaining donor-funded even after years of operation. There is no proven business case yet for insurance services for smallholder farmers
	Transactions	Digital services usually supplied by mobile money / agent banking players, challenged by reach. Usage often around transactions (dominated by G2C/ PSNP) without cross-buying or uptake of other services in bundle
Non-Financial Products	Info services	Multiple services operate at relatively large scale, including ATA services (8028, national market information system, EthioSIS) as well as other, typically donor-supported services. Key gaps around uptake, digitization, financial sustainability, as well as data sharing protocols
	Supply chain	These remain nascent, with a few services provided at a small scale (ex. Digital Green's Loop), and some emerging donor projects (ex. IFC/ Heineken). Services require further support to grow, given structural constraints around development of DFS, and limited coordination and data protocols
	Market access	Market access services are nascent with a few small-scale projects (ex. DEAMAT); ECX well-established but focused on relatively few crops. As with Zambia, no notable tendering / bartering platforms found. As with supply chain services, support is required to scale emerging services

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Solutions: Financial services

Issue Area	*Key Findings*
Financial services	**The scale of financial services is low, and supply is dominated by general loan products and government-led input loans and transactions** • The most commonly used financial services appear to be non-agricultural general loans offered by the 5 top MFIs, agricultural input loans offered by the ATA / MFIs / cooperatives, and G2C transactions • There is a supply gap around credit, savings and loans products that meet SHF-specific needs (e.g. non-input credit, flexible repayment options, etc.) • Services such as insurances are small-scale and largely donor-backed
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The Ethiopian financial services sector is characterized by four types of service providers

Ethiopia follows a bank-led model where only NBE-licensed MFIs and banks are allowed to offer financial services

	Description	Examples	Services Offered	
Formal prudential 	Service providers that are prudentially regulated and supervised by independent statutory regulatory agencies (i.e. NBE)	• **Commercial banks**: 19 commercial banks • **Deposit-taking microfinance institutions**: 35 MFIs (with 5 government-supported regional MFIs accounting for ~94% of savings and 90% of credit as of 2015) • **Insurance providers**: 17 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 and agent banking services:** M-Birr, Hello Cash, etc. • **Social Health Insurance, Community Based Health Insurance** *Ethio Telecom is the single, currently state-owned MNO with >60m subscribers – not allowed to provide financial services beyond airtime transfer*	Credit	✓
			Insurance	✓
			Saving	✓
			Transactions	✓
Formal registered 	Service providers that are registered under a law or government / donor direct interventions	• **Cooperatives**: ~16k primary agricultural cooperatives (c.2014), ~19k SACCOs and over 100 RuSACCO unions (c.2015) • **Non governmental organizations:** e.g., input providers, donors	Credit	✓
			Insurance	×
			Saving	✓
			Transactions	✓
Informal 	Financial services obtained through unregulated / self-regulated forms of structured provision	• **Informal groups:** traditional financial associations e.g. iquib (rotating savings), idir (traditional 'burial associations') • **Shopkeepers/Merchants:** Agro dealers and other shop owners can offer shop credit • **Employers** • **Money lenders**	Credit	✓
			Insurance	✓
			Saving	✓
			Transactions	×

Sources: National Bank of Ethiopia; Federal Cooperative Agency; Association of Ethiopian Micro-finance Institutions; Cash Learning Partnership; provider websites.

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While they still have significant gaps, credit and savings are more developed than transactions and insurance

◑ Level of Development

	Current supply	Key supply gaps	Key barriers to scaling up
Credit ◔	**Typically general (non-ag) or input loans from MFIs/ RuSACCOs** • Highly dominated by general loans from MFIs and RuSACCOs and government-backed input financing • Some agricultural loans at small scale, and non-conventional forms of financing through input financing, solar PayGo, etc.	**Need more non-input credit and higher tailoring to SHFs** • Limited options for on-input credit, flexible repayment, SHF-targeted bundles, etc. • Loan sizes are small due to collateral issues • Limited digital services	• **Lack of suitable collateral** *(may be improved by regulatory changes)* • Challenges to **hiring, licensing and training agents** • RuSACCOs subject to **liquidity, personnel and information** constraints
Savings ◑	**Primarily RuSACCOs and MFIs; emerging mobile money accounts** • Traditional products by RuSACCOs and MFIs, including MFI compulsory savings accounts (attached to loan products) Mobile money accounts could be used as a savings product but highly limited uptake	**Limited digitization and product diversity** • No providers known to be digitizing at scale, or e.g. offering commitment savings products specifically for agriculture	• **Insufficient funds** (of SHFs) • Lack of customer **trust** (e.g. hidden fees) • **Literacy and digital literacy**
Insurance ◔	**Some emerging products, but nascent** • Primarily led by donor-supported programs (e.g. livestock insurance underwritten by Nyala Insurance, designed by PULA and premiums paid by WFP)	**Unproven commercial viability** • Most known micro-insurance products have remained donor-supported for many years	• **High cost** to serve • High risk for insurer when **services are sub-scale** • Lack of customer **trust** (e.g. that payouts will be given)
Transactions ◔	**Limited uptake of broad range of SHF services** • Several digital transaction products in the market (ex. Hello Cash, M-Birr, etc.) • Most rural users of transaction services are PSNP recipients who do not take other services (e.g. 800k out of 1.6m M-Birr users)	**Emerging players have limited focus on SHFs** • Transaction services are focused on urban markets, with limited reach or uptake in rural areas	• Challenges to hiring, licensing and training **agents** • **Lower profitability** of addressing SHFs vs. more affluent urban segments • **Trust, awareness, literacy**

Sources: Stakeholder interviews; Regulation of Mobile and Agent Banking Services; Alemu, "Agricultural Cooperatives sector Development in Ethiopia: Review" (2016); supplier websites.

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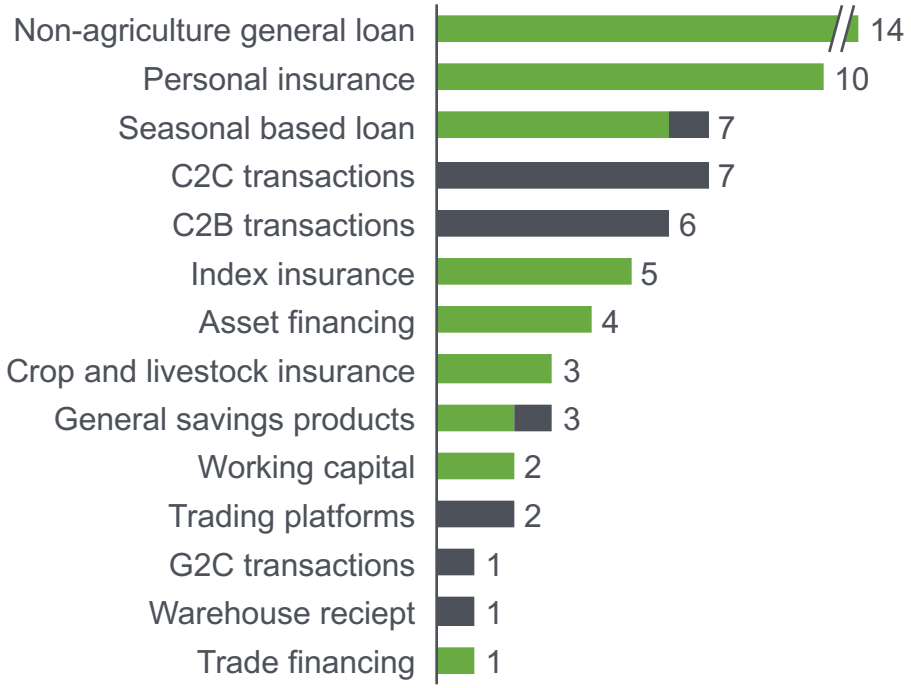
Ethiopia has a relatively limited number of financial services potentially reaching SHFs; most are offered by banks & MFIs

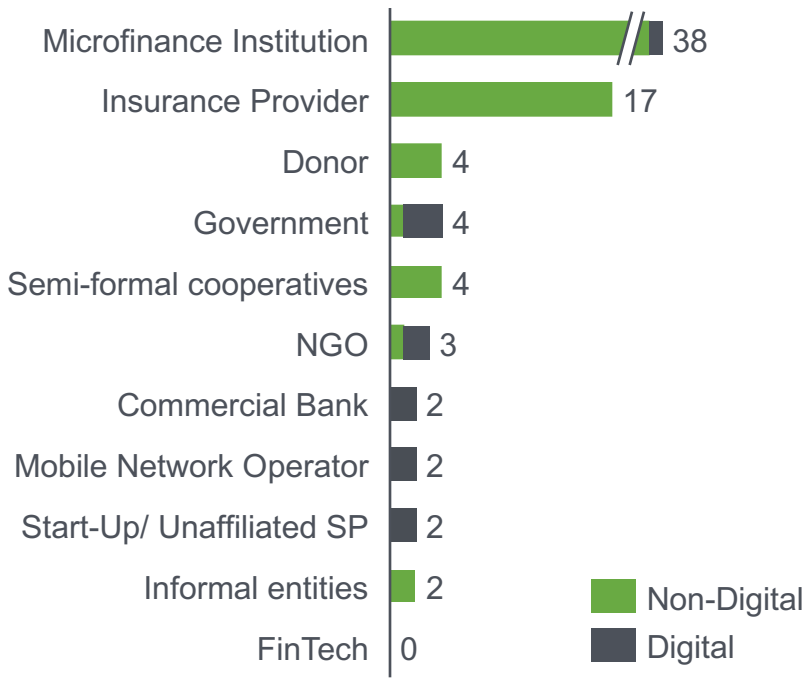
Summary

- **The most common financial products are general loans,** followed by personal insurance, seasonal based loans and C2C transactions
- **MFIs had the highest number of digital and non-digital products**, followed by insurance providers
- Microfinance institutions mostly provide general savings and loan products, with only 7 agri-specific products
- The majority of financial services are non-digital, though there is a move to digitize transactions

Number of service providers by type of products



Number of products by type of service provider



Source: Dalberg ecosystem mapping database.

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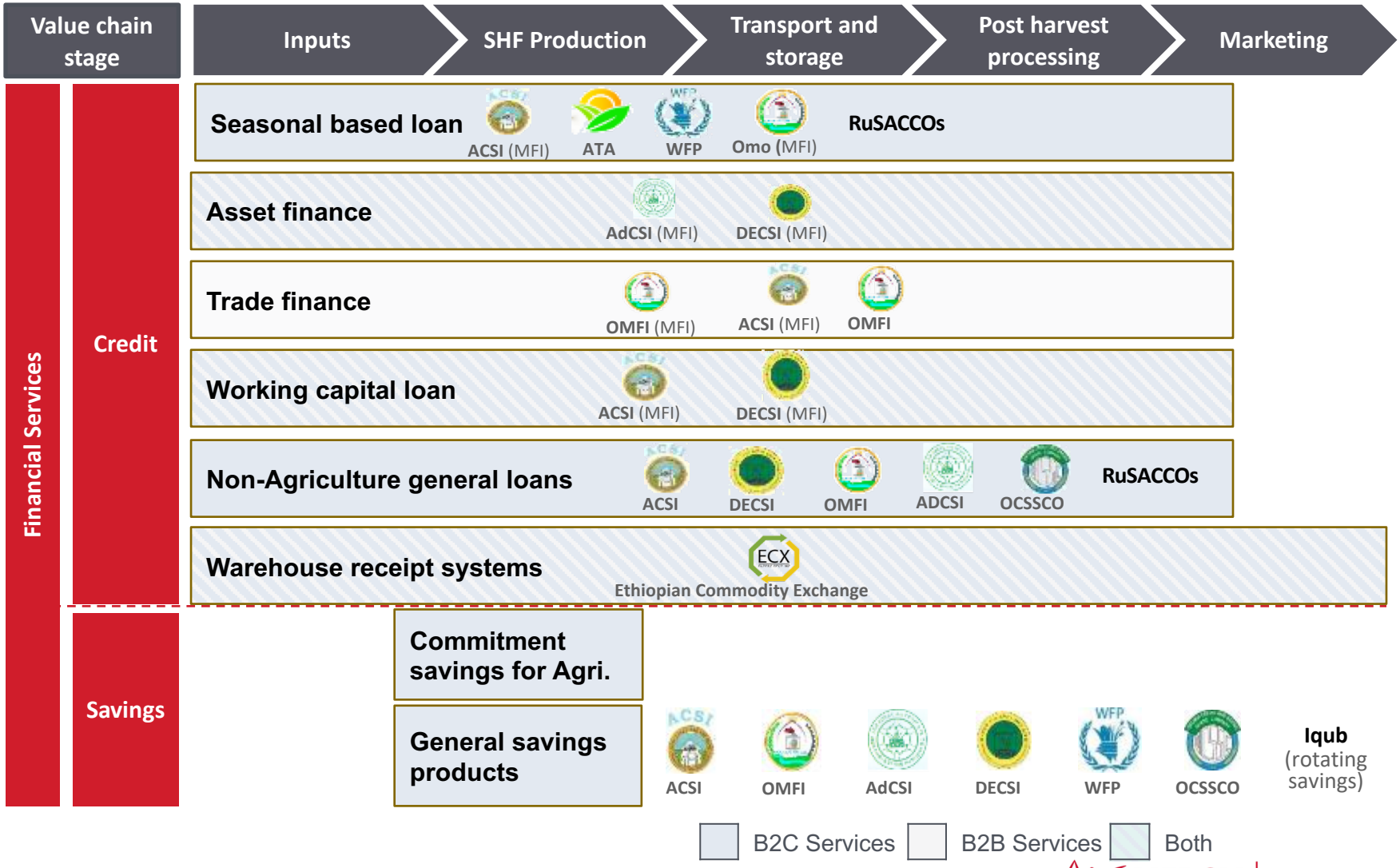
Credit and savings markets are primarily served by RuSACCOs and MFIs



Note: *Illustrative representation of larger players across each service type, more exhaustive list on excel data collection tool, **B2B payments have not been included as they do not form part of financial services to SHFs
Source: Dalberg analysis; Accenture segmentation model

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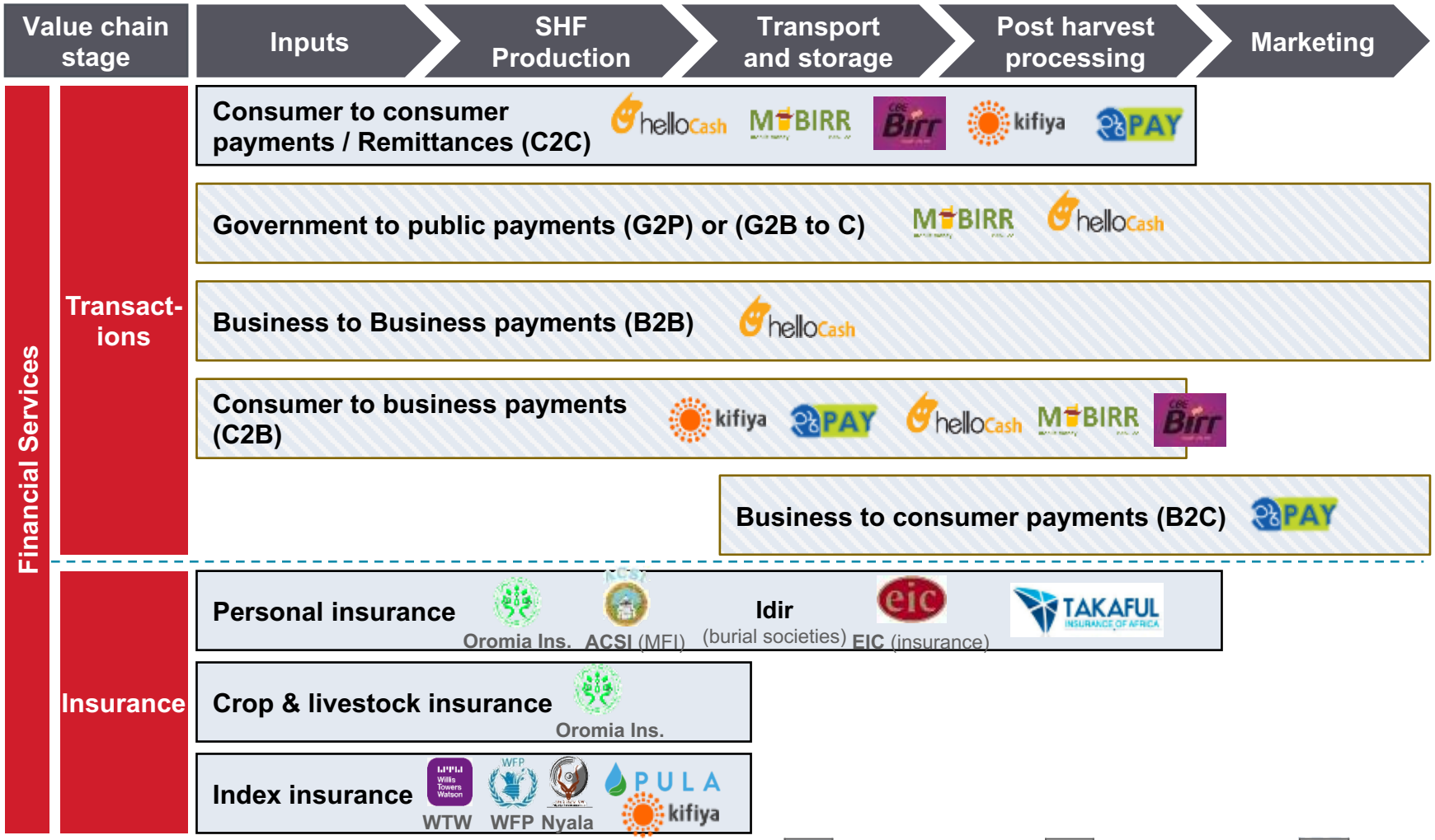
Several transactions products have scaled rapidly (but with limited SHF reach), and insurance offerings are nascent



Note: *Illustrative representation of larger players across each service type, more exhaustive list on excel data collection tool

Source: Dalberg analysis, Bitter Bridges Tech Ecosystem Map (Q1 2019)

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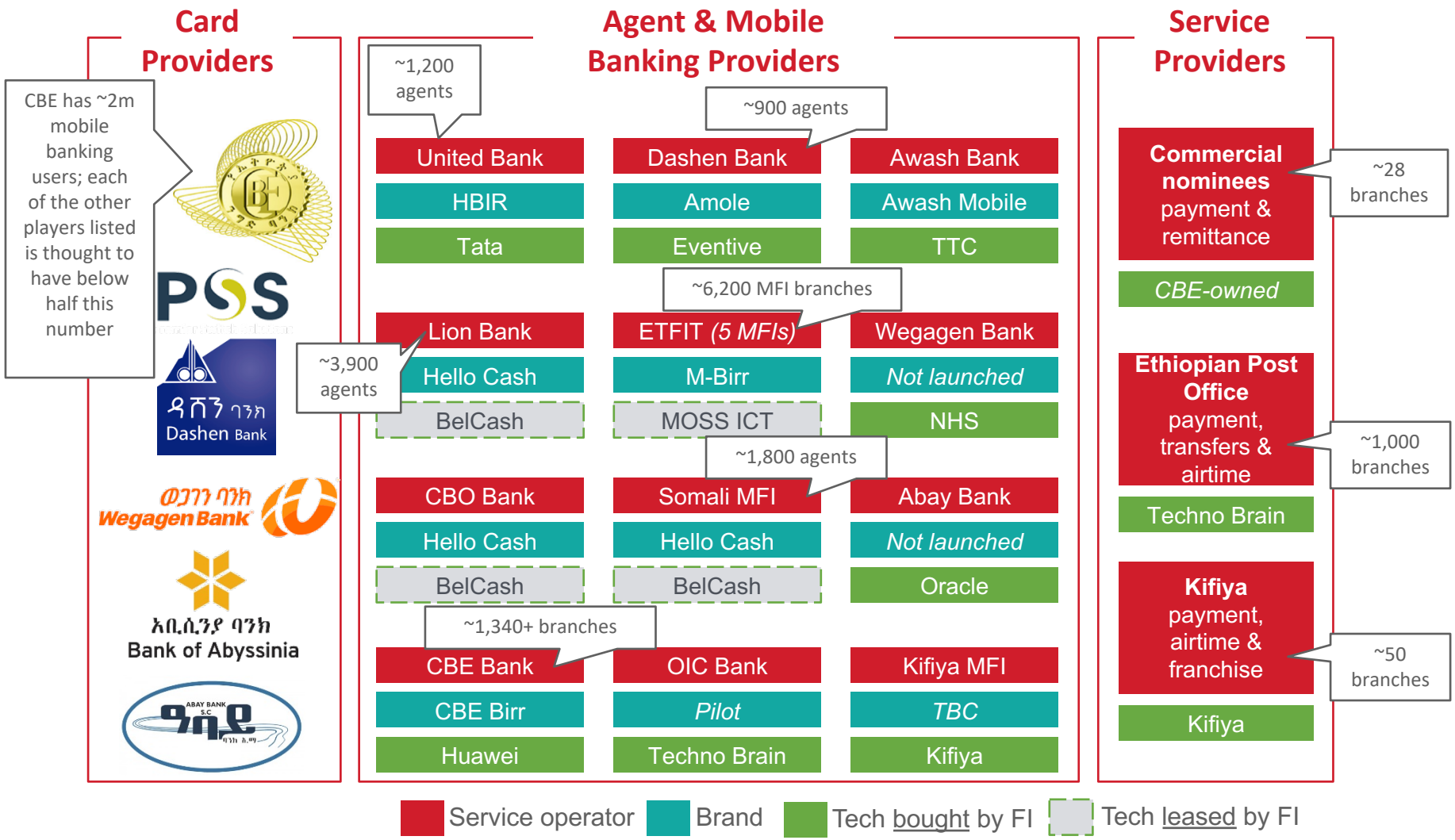
There is a range of payment, mobile money and e-commerce players, although many are small



Source: Kifiya presentation, 2019

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Examples of key financial service providers

Service providers	Credit	Savings	Insurance	Transact-ions	Description
RuSACCOs	✓	✓			• **Strong rural reach:** ~5,500 RuSACCOs aand 100 RuSACCO unions • Typically offer **traditional credit and savings services**, with low default rates • Barriers driven by liquidity gaps as well as flexibility / diversity of product portfolio
Microfinance institutions	✓	✓			• **Highly concentrated landscape of players:** of 35 MFIs in Ethiopia, the five largest government-backed players hold regional monopolies and hold 83.8% of the total capital, 93.7% of savings, 89.8% of credit and 90.4% of total assets of MFIs • Portfolio dominated by **general loans and savings products**, with a few seasonal, working capital and asset financing loans • Some operate satellite offices alongside cooperatives (e.g. to deliver input credit)
ATA – Input Voucher System	✓			✓	• One of the main methods for **farmers to access agricultural inputs** (both cash and credit vouchers). Farmers receive vouchers and e-vouchers that can be used to redeem inputs • **MFIs** collect loan repayments and support financial flows in the system
M-Birr				✓	• Provides mobile money services for services including **C2C and B2C payments** (e.g. utility bills, solar energy service payments). Owned by the **5 largest MFIs** in Ethiopia • **Limited adoption of wide range of services:** more than half the active user base (800k out of 1.6m) only uses M-Birr for Productive Safety Net Programme payments
CBE Birr				✓	• A mobile and agent banking service where customers can deposit, withdraw, transfer money, make payments, buy mobile airtime and pay bills • **May crowd out competitors** given **free transactions**
Nyala Insurance			✓		• **Index based livestock insurance** distributed with livestock drugs in Afar and Somali • Nyala Insurance underwriting risk, with funding from DFID and support from Mercy Corps and Farm Africa

Source: FCA; International Maize & Wheat Improvement Centre, "Financial Products for Farmers and Service Providers – Ethiopia " report, 2016.

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Payment solutions: Heineken & Soufflet are partnering with Hello Cash and Co-op Bank of Oromia to handle payments

Context

- Heineken has a target of **locally sourcing** 60% of raw materials across Africa by 2021
- Their network in Ethiopia now includes **30k** farmers expected to grow to **40k** by end of 2019
  - Farmers are **directly contracted** unlike in Heineken's other markets, given the lower scale and capacity of malting companies (e.g. **Soufflet**)

Key digital opportunities in malt / barley VCs

Payments	Digital payment solution, both from Heineken / Soufflet to aggregators, as well as aggregators to SHFs. Currently managed manually in Excel for 30k farmers
Traceability	No existing traceability system given high fragmentation in Ethiopia. Digital solution requires unique IDs for farms and behavioural change for VC players to adopt
Extension	Potential for local language hotlines and 2-way audio/visual feedback to support extension work. Currently done manually with 120 development agents

Payment solution for Heineken & Soufflet

Previous trial:

- Heineken met a number of digital service providers, including Kifiya, at an IFC / World Bank workshop
- Heineken trialled a **payment solution with Kifiya**
- However, this failed to gain traction due to **limited trust** from smallholder farmers
- Strong **appetite for a digital payment solution** remained, given urgent payments to an increasingly large and diverse farmer base being handled in an Excel spreadsheet

Current pilot:

- Heineken is now trialing a payments solution with **Hello Cash** – for payments from Heineken / Soufflet to **5 aggregators**
- Heineken stakeholders believe that this pilot will perform better than the Kifiya trial because of **wide and trusted distribution network** (i.e . via **Co-operative Bank of Oromia**)
- If successful, the pilot will expand next year to **bulk payments from aggregators to SHFs**
- Day-to-day ownership of system will move **from Heineken to Soufflet**

1. Heineken believe that **leveraging a trusted brand** (co-op bank) is a key success factor for mobile money
2. Potential opportunity to **partner**, especially as ownership of systems moves from Heineken to malteries

Source: Stakeholder interview with Heineken and Hello Cash; press reports..

Solutions: Non-financial services

Issue Area	*Key Findings*
Financial services	**The scale of financial services is low, and supply is dominated by general loan products and government-led input loans and transactions** • The most commonly used financial services appear to be non-agricultural general loans offered by the 5 top MFIs, agricultural input loans offered by the ATA / MFIs / cooperatives, and G2C transactions • There is a supply gap around credit, savings and loans products that meet SHF-specific needs (e.g. non-input credit, flexible repayment options, etc.) • Services such as insurances are small-scale and largely donor-backed
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Delivery channels	**Delivery channels are relatively concentrated in a limited set of ecosystem players, with high opportunity to strengthen the agent network** • Ethio Telecom currently holds a monopoly and has substantial reach • High opportunity for cooperatives and cooperative unions given their rural reach (vs. MFIs and banks) but capacity building is required
Alter-native Data	**There is a wealth of existing data** within FIs, Ethio Tel, government players (including MoA and ATA), donor projects, and private sector players… **…but opportunities are likely longer term** given the enabling environment (including data protocols), and current level of digital capability in rural areas

Implications

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Information services are developing well, with supply chain and market access services more nascent

Level of Development

	Current supply	Key supply gaps	Key barriers to scaling up
Info services	**Many well-established and emerging projects** • Many services at relatively large scale, often driven by the ATA (e.g.. 8028 farmer helpline, national market information system) as well as other providers (e.g. aWhere weather data) • A large number of emerging projects by start-ups and backed by donors (e.g. Yazmi, CABI, Digital Green, etc.)	**Good variety of services exist; key supply gap is in scaling up** • A good variety of information services exist e.g. across waaaaeather, farmer helplines, digital content • Key challenge is in driving uptake and familiarity	• SHFs' **familiarity & trust** • Challenge of designing services across **multiple regions and languages** (including appropriate vernacular) • Appetite to adopt digital information services varies by **regional bureaua**
Supply chain	**Supply chain services are nascent** • Relatively few services identified • Emerging initiatives such as IFC/ Heineken • A few emerging innovations at smaller scale, e.g. Digital Green's Loop service)	**Gap in solution scale and sustainability** • Current supply chain solutions appear to generally be small in scale and not yet commercially viable	• Clear **protocols and incentives for data sharing** • **Coordination** between key stakeholders (e.g. MoA, co-ops, regional bureaus, etc.) • Again, appetite to digitize varies by **regional bureaus**
Market access	**Market access services are nascent; ECX well-established but focused on relatively few crops** • ECX a key trading platform established in 2008, but primarily focused on exports with unclear impact on price volatility • Other trading platforms have failed to gain much traction; no notable providers of tendering and bartering platforms found	**Lack of widely adopted trading, tendering and bartering platforms** • Supply gaps in Ethiopia appear broadly in line with e.g. Zambia in level of maturity of market access services	• Level of **awareness** of structured markets • Availability of reliable and timely **market information** / **traceability**

Source: Stakeholder interviews; provider websites.

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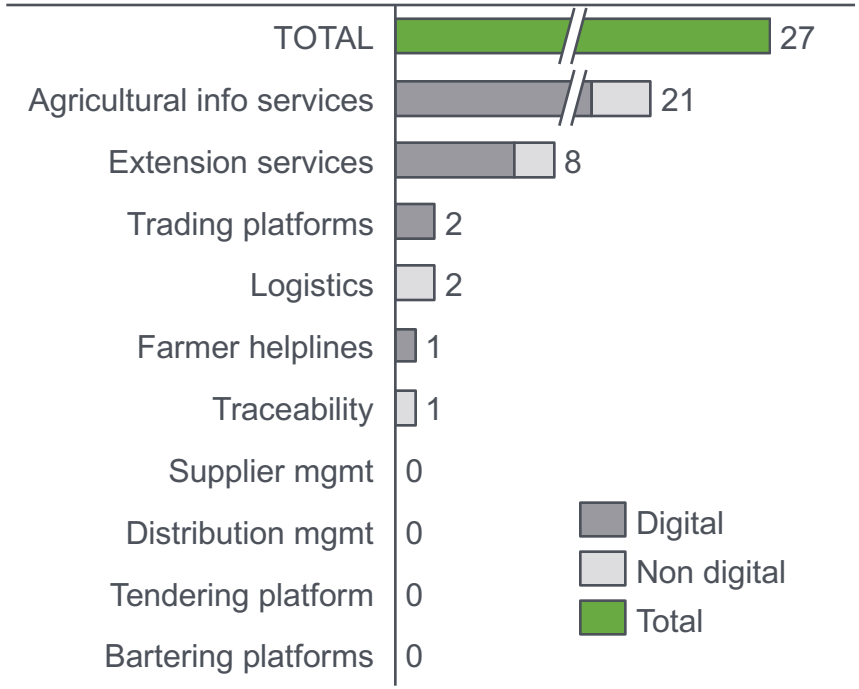
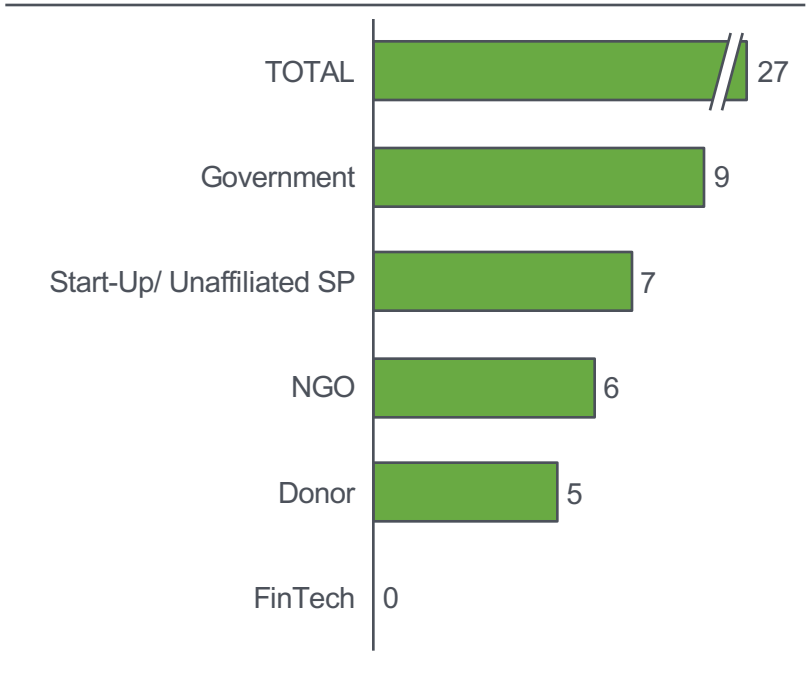
Of the 27 offerings we evaluated, many are information and extension services, with most partially or entirely digital

Summary

- **We have identified 27 non-financial services for farmers**
- **Information services are dominated by government-led services** (ATA's 8028 farmer helpline, the national market information system, etc.) and donor-backed projects
- There is a move towards digitization of information services for farmers
- The supply of other digital non-financial services such as supply-chain and market access services is still nascent





Source: Dalberg ecosystem mapping database.

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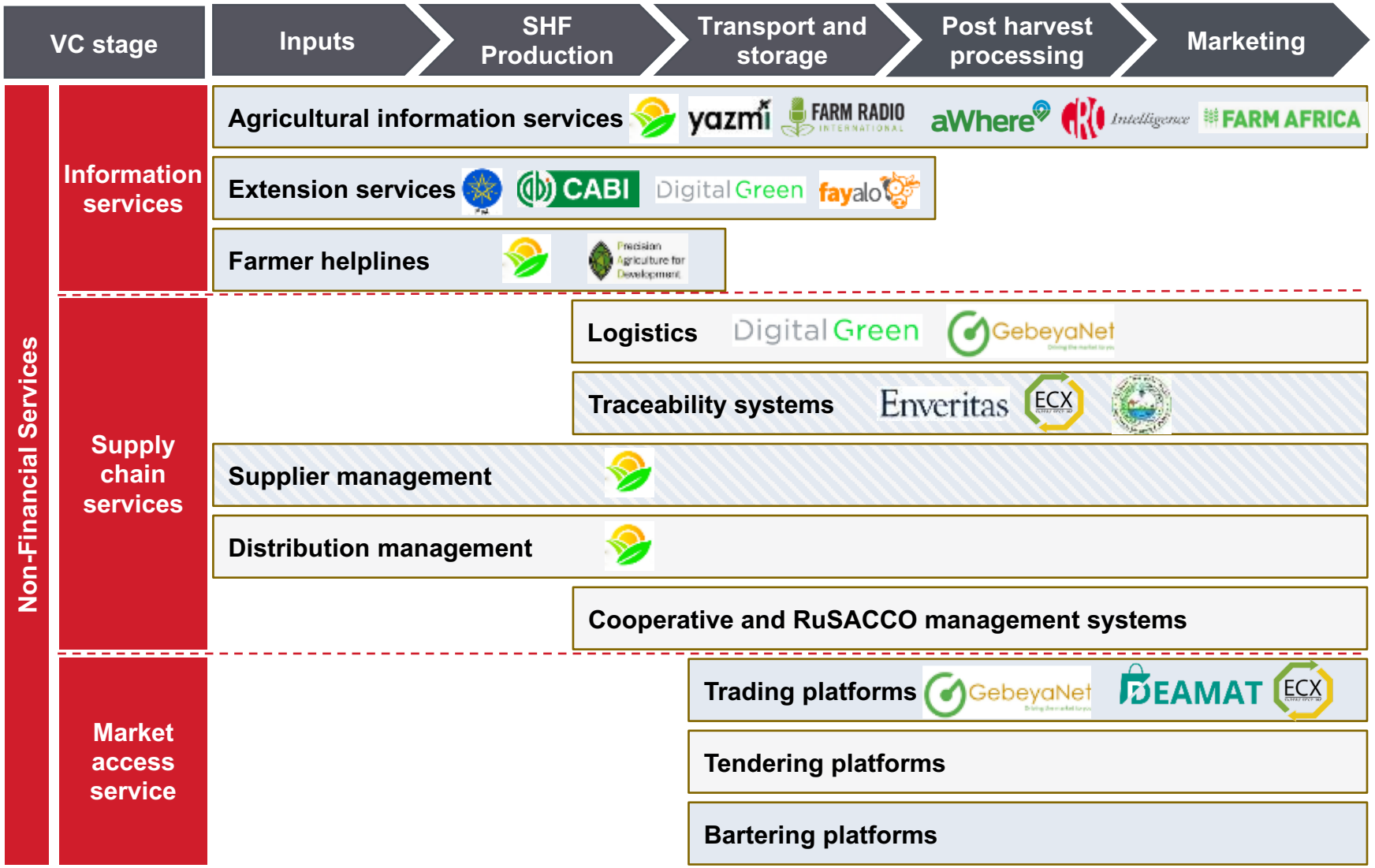
Information services are more developed, while supply chain and market access services are nascent



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Source: Dalberg analysis/stakeholder interviews, ICT4EAS Case studies, Bitter Bridges Tech Ecosystem Map (Q1 2019)

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Information services are more developed, while supply chain and market access services are nascent

Provider	Service	Info,	S.C	M.A	Description
ATA	8028 Farmer Hotline	✓			• **Strong reach**: Free farmer helpline that has reached 4m+ smallholder farmers
	Input tracking system	✓	✓		• Tracking system for the **movement of agricultural inputs** (production, trade, etc.)
	National market information system	✓			• Provision of timely **market and price information** for value chain actors
	EthioSIS	✓			• Information on **soil properties & fertilizer recommendations**
yazmi	Satellite information	✓			• NGO focused on transmitting educational content to tablets using satellites • They have began using similar technology to deliver transformative and timely **agriculture information to rural communities through satellite technology**
CABI	Plantwise (plant clinics)	✓			• Program launched by a global NGO that establishes and supports sustainable **networks of plant clinics**, where farmers can find practical plant health advice
	Plantwise Knowledge Bank	✓			• Provides practical **online and offline plant health information**
aWhere	aWhere	✓			• aWhere delivers **near real-time agri-weather information to smallholder farmers**. Has a global agronomic weather database with 1.6 million 'virtual weather stations' that can predict current and future weather events at 9km intervals
Digital Green	Community videos	✓			• DG produces and disseminates improved **agricultural and livelihood practices using community-sourced videos**
	Loop		✓	✓	• A human-mediated mobile phone application that improves farmers' access to markets by helping them to **aggregate and transport perishable produce**
GebeyaNet	GebeyaNet			✓	• Gebeyanet **connects smallholder farmers** , cooperatives and commercial vegetable farmers with buyers like wholesalers, Hotel and retailers. In addition, they **facilitate transactions** through mobile banking, and use registered truck drivers for **door-to-door deliveries**

Source: Dalberg ecosystem mapping database.

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Information hotlines: There are established and emerging information hotlines incorporating two-way feedback

ATA's 8028 Farmer Hotline

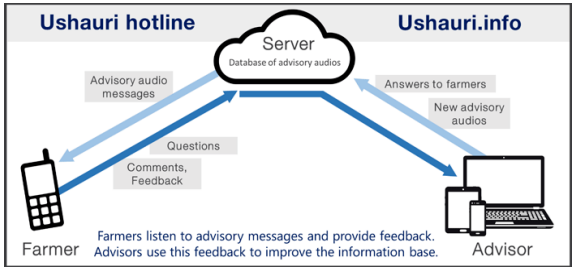
- Toll-free IVR/SMS system giving **information to farmers and development agents** (DAs) via an automated hotline, push-based alerts, interactive helpdesk and survey
- In 3 years of operation, the system has generated over **28m calls** and **~4m registered users**
- Also underpinned the **wheat rust early warning system** to help DAs identify cases of rust at woreda level – reaching **10k** DAs and **275k** SHFs
- **PAD** are working with ATA to refine the interface, and to add **additional modules on livestock** – and potentially financial literacy
- ATA is planning to use 8028 to register farmers in the **Farmer Production Clusters** project

888 Hotline – MoA

- Toll-free 888 government call centre, initially set up by Ministry of Communication & Information Technology
- Initially for **queries on government organizations** across a wide range of ministries…
- …**but there is evidence that the Ministry of Agriculture are extending their module to include extension services**
  - 888 hotline was represented at the ICT for Agricultural Extension conference – and presented as an MoA service giving advice similar to the ATA's 8028 hotline (e.g. when to plant seeds, etc.)
  - Further conversations are required to understand current and intended scope for the 888 hotline

Ushauri hotline

- IVR hotline allowing farmers to listen to pre-recorded advice and send follow-up questions
- Agricultural advisors have access to a dashboard (Ushauri.info) to listen to farmers' questions and comments, and send responses directly to the farmer's phone (either single or bulk responses for similar questions)
- **Currently piloting in Kenya with interest in expanding to Ethiopia**



1. There is **high opportunity for two-way feedback:** deploying hotlines to gather data from farmers
2. There is a **risk of duplication** of efforts, which is particularly costly in Ethiopia given high investment needed to address a diverse population (e.g. languages and appropriate vernacular)

Source: Stakeholder interviews; ATA documents; ICT4EAS Conference & website; MCIT website.

Logistics: there is growing interest in mechanization, but the nascent DFS and low cooperative capacity remain key issues

- **Ethiopian smallholder farmers have a substantial unmet demand for machinery**. While the use of machines remain insignificant, Ethiopia has 6 million draught oxen and needs 6 million more (equivalent to 500,000 tractors) to meet its demand
- A study at Bahir Dar University showed that 80% of the smallholder farmers they surveyed would be willing to use hire tractors
- **Mechanization services have gained considerable traction** in neighboring countries (ex. John Deer and HelloTracter in Kenya), and has gained the interest of several institutions (ex. the Ministry of Communication and Information Technology)
- There 300 contractors (private service providers and cooperatives) offering mechanization services to SHFs, but **demand is far above supply**. In addition, there is **emerging interest to offer digitally enabled mechanization services** to farmers (ex. Hello Erf)
- However, mechanization services are limited by several structural issues. First, **farmers are not familiar with rental services** (~79% of SHFs are not used to renting oxen). In addition, SHFs have very low access to financial services, which are needed for rental services
- SHFs often have very small land plots and the majority prefer to pay for services in groups (92%). There fore, there is a need to improve the capacities of primary cooperatives to manage group loans (ex. bookkeeping, financial management, etc.) for these services to succeed

Hello Erf

- Hello Erf is an emerging service that plans to pilot its operations in Ethiopia
- It functions as a **call center based mechanization hotline** that leverages Mobile apps, web app and call center to link both farmers and Mechanization service providers (Uber for tractors)
- **Smallholder farmers and cooperatives do not have to have a mobile app**, but tractor operators use apps to track their operations and profits (ex. data on tractor usage)
- The company will **charge service providers** (5–10% commissions) on tractor rentals

Sources: Cogent Food and Agriculture (Bahir Dar University 2018); Determinates of SHF WTP for extension services; Dalberg analysis

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Market access: A number of innovative but nascent solutions face structural challenges to scaling

		Description	*Barriers in Ethiopia*
Ethiopia	DEAMAT	• **e-commerce for agricultural products** that recently began operating in Mekele • The platform connects SHFs to consumers (individuals and businesses) through a web-based application and **integrated online payments** • **Shipping agents** collect and deliver the orders after online payments • EAMAT gets its revenue through **commissions** on product orders	• Requirement to use **mobile money accounts for payments**, which is still a challenge, especially for farmers and cooperatives • **Difficulty of reaching smallholder farmers** through a centralized door-to-door delivery system
	Gebeya Net	• GebeyaNet **connects smallholder farmers , cooperatives and commercial fruit and vegetable farmers with buyers** such as wholesalers, Hotel and retailers • Payments on the e-commerce platform are made through **mobile banking transactions** • GebeyaNet also provides **logistic solutions to get products delivered** from the farmer to buyer by using registered truck drivers	
Kenya	iProcure	• A Kenyan start-up **optimizing the agriculture input supply chain** • iProcure builds the **supply chain technology and the physical infrastructure** (warehouses) to ensure a demand led, data-driven connection between input manufacturers and SHFs • SHFs order inputs through USSD, pay via mobile money and receive vouchers that they can exchange for inputs at collection points	• Replicating this model in Ethiopia would require **higher usage of DFS and investments in physical infrastructure**

In Ethiopia, private sector appetite and technologies exist to support market access & mechanization initiatives – but they need to overcome the low uptake of digital financial services, including mobile money services

Sources: ICT4EAS; iProcure; Dalberg analysis

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About 65% of the financial and non-financial products are bundled services, typically within three bundling archetypes

	Bundled financial services	Bundled non-financial services	Bundled financial and non-financial services
Description	• Formal prudential and non-prudential service providers such as commercial banks, MFIs, insurance providers and mobile service providers typically offer multiple financial services. • **Bundling of services such as credit and insurance** has shown to offer more value to farmers while reducing risk to credit providers.	• The majority of non-financial service providers offer multiple service types. • **Information (weather and market price) and extension service the most commonly** bundled services • These services tend to use mobile platforms as the delivery channel, hence allowing scale and smallholder reach	• The combination of financial and non-financial services is more commonly found in **built for purpose digital solutions** • These services are typically offered by a start-up with funding from a donor and provide **financial services together with extension, information or financial literacy services**
Examples	WFP World Food Programme Through the R4 Rural Resilience Initiative, WFP enables vulnerable rural households to increase their food and income security improve their resource management through asset creation **(risk reduction**); insurance (**risk transfer**); livelihoods diversification and microcredit (**prudent risk taking**); and savings (**risk reserves**). In Ethiopia the program bundles credit, insurance and savings.	Loop **Loop** is a human-mediated mobile app powered by Digital Green that improves farmers' access to markets by helping them to aggregate their perishable produce. Through a trusted community aggregator, produce is separated so that farmers with higher quality produce can get better prices. Aggregators then take and sell the produce to cut transportation costs, negotiate better market price and increase market acces.	TECHNO BRAIN Empowering Lives **Techno Brain** and **Green Agro Solutions Plc** provide data insights to more than 100,000 malting barley farmers in the Arsi zone. Their platform leverages Green Agro's existing credit and mechanization services to also provide farmers with weather forecasts, pest detection, advisory service and mechanization equipment, through mobile devices via text messages and voice platforms.

Source: Service provider websites, Dalberg Analysis

Bundled solutions are generally met with a higher willingness to pay from smallholder farmers

Apposit's TERRA Platform provides a one stop solution, enabling stakeholders along the value chain to easily access agricultural information/services. The system can be accessed from a web portal/ app in local languages:

- **Terra Voucher Management System (VMS)** automates paper based agricultural transactions. The system is being used to scale up ATA's e-voucher system allowing agricultural inputs to be distributed in cash or credit (through NFC/ smartphones). Reach - 360k transactions by 2020
- **TERRA Aggregator Management System (AMS)** helps aggregators manage their members/client, monitor their input and output marketing activities and manage their finances.
- **TERRA Market Price** - allows farmers to have access to real time market price of commodities through automated IVR and/or SMS service (paid service).
- **TERRA Weather Forecast** provides four to seven days weather forecast information for farmers through SMS and IVR, tailor made to specific areas.

Techno Brain and **Green Agro Solutions Plc** provide data insights to 100,000+ malting barley farmers in the Arsi zone.

Techno Brain's Digital Agriculture Platform collects/organizes data-based GPS, crop life cycle, seed details, land type, soil nutrition and expected rainfall and weather patterns, to provide insights that can help the farmers with decisions.

Leverages Green Agro's existing **"one-stop farming solution"** which currently provides farmers with credit, inputs and mechanization services. Green Agro Solutions will be responsible for creating digital farmer profiles, conducting farmer outreach.

Information will be channeled to farmers through SMS and IVR platforms .

To get the service, **farmers will pay 58 Br a hectare annually** after **an initial subscription to the service of 117 Br**. Techno Brain does not foresee challenges as farmers are already paying for Green Agro's services

Farmers are willing to pay for services if they can see specific economic value (e.g. pricing uplift and savings on travel from pricing information), or if services are bundled appropriately (e.g. Green Agro's one-stop solution)

Sources: Stakeholder interviews Terra Platform Brochure/Apposit website, Techno Brain/ Green Agro press release, https://addisfortune.news/two-firms-team-up-to-provide-ag-info

Solutions: Delivery channels

Issue Area	*Key Findings*
Financial services	**The scale of financial services is low, and supply is dominated by general loan products and government-led input loans and transactions** • The most commonly used financial services appear to be non-agricultural general loans offered by the 5 top MFIs, agricultural input loans offered by the ATA / MFIs / cooperatives, and G2C transactions • There is a supply gap around credit, savings and loans products that meet SHF-specific needs (e.g. non-input credit, flexible repayment options, etc.) • Services such as insurances are small-scale and largely donor-backed
Non-financial services	**Non-financial services have gained more traction, particularly info services** • Information services are dominated by government-led services (national extension services, ATA's 8028 farmer helpline, the national market information system, etc.) although there is some risk of duplication • There is a clear move towards digitization of info services for SHFs, and aggregation of data into a single hub (e.g. Digital Green consortium) • Supply chain and market access services are starting to emerge and require further support to grow given structural challenges, especially around DFS and overall digital capability
Delivery channels	**Delivery channels are relatively concentrated in a limited set of ecosystem players, with high opportunity to strengthen the agent network** • Ethio Telecom currently holds a monopoly and has substantial reach • High opportunity for cooperatives and cooperative unions given their rural reach (vs. MFIs and banks) but capacity building is required
Alter-native Data	**There is a wealth of existing data** within FIs, Ethio Tel, government players (including MoA and ATA), donor projects, and private sector players… **…but opportunities are likely longer term** given the enabling environment (including data protocols), and current level of digital capability in rural areas

Implications

- Within financial services, key **supply gaps** are around **digitally-enabled services tailored to SHFs**
- Within non-financial services, avoiding **duplication of effort** and ensuring **bundling of value-adding services** is critical to establish sustainable offerings
- Complex questions around **private sector vs. government ownership** of key services
- High opportunity for **cooperatives, cooperative unions and RuSACCOs** as a delivery channel but **capacity building** is required

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In any scenario, a key success factor is delivery channel: choosing the right channel(s) and approach to build capacity

	Delivery channel	Services F.S	Services N.F.S	Focus on SHFs	Digital capacity	SHF reach	Potential to leverage
Financial Institutions	Formal banks	✓		Low	Medium	Low	**Limited** - mostly concentrated on urban areas
	MFIs	✓		High	Medium	Low	**Moderate -** high focus on SHFs, but fewer branches than cooperatives and low digital capacity
	Agent banking / payment co.	✓		Medium	High	Medium	**Moderate –** good technical capability but require incentives to serve SHFs and more extensive delivery channels
	Insurance	✓		Medium	Low	Low	**Limited** - primarily focus on urban populations
	RuSACCOs	✓		High	Low	High	**Limited** – very constrained digital capacity (which overrides other considerations such as high SHF reach and focus on SHFs)
Cooperatives & Farmer Groups	Cooperatives/ Coop unions	✓	✓	High	Low	High	**Limited to moderate** – high reach and high importance in terms of basic service provision, but substantial capacity building required via unions
	Informal financial groups	✓		High	Low	High	**Limited** – high reliance by SHFs but again capacity building required
	Intermediaries	✓	✓	High	Low	High	**Limited –** high interaction with SHFs but generally fragmented with very low digital capability
Others	Tech start-ups	✓	✓	Medium	High	Low	**Moderate to high –** good technical capability but require support to scale
	Ethio Telecom		✓	Low	Medium	Medium	**Limited to moderate** – high reach throughout Ethiopia, but requires stakeholder engagement to improve service quality
	Off-takers	✓	✓	Medium	Medium	Medium	**Moderate to high** – good leverage point in selected VCs
	One-stop shops (ATA)	✓	✓	High	Low	Low	**Moderate to low -** relatively commercial outlook, but low reach (700 one-stop shops, expected to scale to 1,700 in 1-2 years)
	E-vouchers (ATA)			High	Medium	Medium	**Moderate** – relatively strong digital capacity but needs product/system development, and incentives for MFI/RuSACCO personnel
	Ag extension		✓	High	Low	High	**Moderate** – highest reach in Africa but major challenges require solving for (including high churn, low digital capacity)
	Other service providers	✓	✓	Medium	Medium	Medium	**Moderate –** some potential to drive ag-related services but benefit to SHFs needs to be clear

Source: Stakeholder interviews; provider websites.

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There are significant development in solar off-grid which could be an effective delivery channel for DFS

		Description	Opportunities and Challenges
Private sector	HelloSolar	• The HelloSolar project is a decentralized off grid solar energy solution using a pay-as-you-go model • The program was **piloted in the Somali region where 80 off-grid units have been installed**. Beneficiaries can pay daily, weekly or monthly payments installments from a mobile phone through 1,150 HelloCash agents or banks • HelloSolar aims to **leverage their system to increase connectivity and access to digital services in across sectors**	
Multilateral/Bilateral	IFC/WB: Lighting Africa program	• The overall joint goal of the Lighting Africa/ Ethiopia program is to accelerate the development of off-grid solar lighting and energy markets by: 1) **Improving the enabling environment**, 2) **Supporting the scale-up and replication of high potential businesses** by providing training **and facilitating access to finance for local solar energy distributors**, 3) Increasing demand and addressing market development bottlenecks through a **dedicated consumer awareness and education campaign**, 4) **Addressing policy barriers**	
Government	Ministry of Water, Irrigation and Electricity (MoWIE)	• MoWIE targets to **provide access for the remaining 7.7 million rural households without grid connectivity**, which is equivalent to about 35% of the population, **by 2025** • In is planning to commission **350 decentralized grid systems in the upcoming 4-5 years**. Simultaneously, Ethiopia Electric Power (EEP) aims to contribute to the electrification of rural Ethiopia by adding another 200 microgrids	**Opportunities:** 1. Existing efforts to expand access to off-grid solar systems and solar small-scale irrigation could be leveraged through a **cross-sector drive to expand access to digital financial services**. **Challenges:** 1. The large upfront costs associated with the installation of off-grid solar systems constitute a hurdle that's hindering its wide-scale viability 2. For example: the **initial investment costs** for setting up a solar-powered small-scale irrigation system are **typically between $10,300 and $15,600 per hectare** 3. To facilitate widespread adoption, it is necessary to overcome existing farmer skepticism

Sources: Stakeholder Interviews, World Bank, Sun Connect White Paper (2019), Farm Africa SSI report.

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Mobisol expands access to off-grid energy whilst also giving SHFs access to financial services

Offerings	Type of Service	Mobisol Ethiopia
Off-grid solar solutions for household and microenterprises	**Solar and customer services**	✓
A software suite with maintenance servicing and after-sales support.		✓
PAYG system – 36-month installment plans via mobile money	**Financial services**	✓
Alternative Credit Scoring to assess credit worthiness for customer without credit history *		✗
Bundled smart-phone installment plan *		✗
Mobisol Academy trains & certifies agents to expand distribution channels	**Training**	✓

Mobisol recently filed for preliminary insolvency proceedings, but this remains an interesting case study on leveraging PayGo data as credit history

Mobisol Ethiopia

- Mobisol entered the Ethiopian market in 2017 and is partnered with SunTransfer, Ethiopia's principal solar service distributer
- SunTransfer brings in **local knowledge and an existing network of Solar Centers**, staffed with solar technicians
- Mobisol has also partnered with IFC/WB's Lighting Africa to promote PAYG business models.

Opportunities for SHFs

- **Loans are structured to considers seasonal income** and allows SHFs to pay above the required amount when they have higher disposable income
- The bundled smart- phone installment plan would increase access to mobile phones for SHFs, **making them more affordable whilst simultaneously broadening access**
- **Alternative credit system** offers loans for customers who have limited financial information and no prior credit history. This credit data could be leveraged for other services for SHFs (ex. credit for machinery).

Off-grid solar is a potential entry point for a wide-range of financial services for SHFs, especially if they are bundled with add-ons like smartphones and alternative credit systems that enable access

Sources: Mobisol Website and Press Releases, GSMA Mobile for Development report (2017).

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Solutions: Delivery channels

Issue Area	*Key Findings*
Financial services	**The scale of financial services is low, and supply is dominated by general loan products and government-led input loans and transactions** • The most commonly used financial services appear to be non-agricultural general loans offered by the 5 top MFIs, agricultural input loans offered by the ATA / MFIs / cooperatives, and G2C transactions • There is a supply gap around credit, savings and loans products that meet SHF-specific needs (e.g. non-input credit, flexible repayment options, etc.) • Services such as insurances are small-scale and largely donor-backed
Non-financial services	**Non-financial services have gained more traction, particularly info services** • Information services are dominated by government-led services (national extension services, ATA's 8028 farmer helpline, the national market information system, etc.) although there is some risk of duplication • There is a clear move towards digitization of info services for SHFs, and aggregation of data into a single hub (e.g. Digital Green consortium) • Supply chain and market access services are starting to emerge and require further support to grow given structural challenges, especially around DFS and overall digital capability
Delivery channels	**Delivery channels are relatively concentrated in a limited set of ecosystem players, with high opportunity to strengthen the agent network** • Ethio Telecom currently holds a monopoly and has substantial reach • High opportunity for cooperatives and cooperative unions given their rural reach (vs. MFIs and banks) but capacity building is required
Alter-native Data	**There is a wealth of existing data** within FIs, Ethio Tel, government players (including MoA and ATA), donor projects, and private sector players… **…but opportunities are likely longer term** given the enabling environment (including data protocols), and current level of digital capability in rural areas

Implications

- Within financial services, key **supply gaps** are around **digitally-enabled services tailored to SHFs**
- Within non-financial services, avoiding **duplication of effort** and ensuring **bundling of value-adding services** is critical to establish sustainable offerings
- Complex questions around **private sector vs. government ownership** of key services
- High opportunity for **cooperatives, cooperative unions and RuSACCOs** as a delivery channel but **capacity building** is required

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There is a rich range of potential data sources, but opportunities to fully leverage this are likely longer-term

There is a wealth of potential alternative data sources across Ethio Tel, FIs, government actors, etc.

	Description	Examples
Mobile Data	Data captured by mobile phone, incl. customer usage & purchase data	Ethio Tel data: • Airtime purchases • Call / SMS activity
VC Actors	Records captured by those who transact with SHFs (e.g. aggregators, processors)	• Heineken / Soufflet purchase data • Ethio Chicken's feed dealers' data
Service Providers	Data from services for SHFs including SACCOs and informal FIs, government and private providers	• Paper records of SACCOs • ATA e.g. 8028 • Non-FS providers e.g. Digital Green
Data Providers	Data captured, aggregated, and/or analyzed by third parties	• Rabobank satellite crop monitoring • aWhere stations
Gov.	Data captured through central or regional government entities	• Digital ID • Ministry of health
Donor projects	Data captured through donor projects in other sectors	• Health projects data (ex. Save the Children, Dimagi...)

Source: Stakeholder interviews; provider websites.

…but opportunities are likely to be realized over the longer term

Given the enabling environment and current digital capacity levels, a number of areas require further development before alternative data opportunities can be easily leveraged:

- **Data sharing protocols:** There remains a gap in clear data sharing protocols for both government and private sector players
- **Ethio Tel appetite and bandwidth:** Ethio Tel has historically shared limited data on its operations (although data sharing appears to be increasing e.g. data shown on ET website)
- **Private sector incentives to share data:** Private sector players need to see clear benefits from sharing data for alternative data purposes
- **Digital capacity:** Many data records remain paper-based including at Farmer Training Centres, SACCOs, etc.

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Examples of alternative data include the upcoming digital ID system, as well as existing government and donor projects

National ID

- The Ethiopian will launch a new biometric digital ID that provides centralized and more specific data than the current regional ID (ex. fingerprints, blood type,)
- This data can be shared with service providers (ex. banks) to verify identities

Agriculture projects

- Projects in the agriculture sector that are currently siloed can provide valuable data
- For example, data from ATA's EthioSIS project can potentially serve as a basis for credit scores (land fertility information), precision agriculture services (ex. in combination with the 8028 hotline service), investment advisory, etc.

Health projects

- Health projects that target disadvantaged populations often gather data on large numbers of smallholder farmers (ex. Save the Children's database of 1 million farmers)
- This data can be used to provide tailored agricultural services (ex. nutrition vs. agricultural advisory services)

Alternative data sources can (i) facilitate customer registration for financial and non-financial service providers, and/ or (ii) contribute to further tailoring services to smallholder farmer needs

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Health data and insights can be leveraged to better inform agricultural information services and best-practice

Example 1: Use nutrition indicators to feed into agricultural extension services

Save the Children

1. Supporting the GoE in developing a **comprehensive national nutrition** plan, that incorporates maternal and infant and young child feeding strategies into the health system.
2. Save the Children and ATA have agreed to deliver **nutrition-sensitive agricultural messages for Ethiopian farmers through ATA's 8028 Farmers' Hotline**.

Save the Children: highlights a successful use case for leveraging insights across sectors

1. The program **utilizes health/nutrition indicators to tailor information for agricultural extension programs and precision agriculture** in nearly 120 districts.
2. To avoid duplication efforts, **nutrition information is layered onto the existing 8028 system** with the aim of contributing to the dietary consumption behavior improvement of farmers.

Example 2: Transfer best-practice

Electronic Community Health Information System (eCHIS)

The Ministry of Health is **developing a new mobile-based electronic Community Health Information System** which will enable **40,000 extension workers to capture data electronically** on the Health Extension Program and other community-level services. The system includes an **"electronic folder" that captures household level health information**.

eCHIS: presents an opportunity to leverage alternative data

The successful transfer of the Community Health Information System onto an electronic system could also be used as a **best-case learning tool for similar digitization initiatives in the agricultural sector.** The eCHIS system could also be leveraged for: 1) farmer registration 2) nutrition data that could feed into agricultural information systems and precision agriculture practices.

Data/Insights from the health sector can feed into agricultural information systems to better inform precision farming practices

Sources: Ministry of Health, Save the Children program information, JSI Research & Training Institute.

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Outside Ethiopia, First Access analyzes credit risk from a range of alternative data sources

Founded: 2011

Office(s): USA,

Countries of operation: USA, Tanzania, Kenya expanding in 2016 into Zambia, DRC Congo, Uganda, Malawi and Nigeria

No. of employees: 11-50

Type of alternative data: Mobile Transactions

Key partners: CGAP

Customers reached: 200,000+

Donors / investors: Social Entrepreneur's Fund, Acumen, Golden Seeds, Nigel Morris, Accion Venture Labs, Mastercard Foundation

Overview of model	Scale and results
• **Uses mobile data and financial data –such as a person's utility and educational payments – to determine creditworthiness of a loan applicant**. Their demographic reach includes SHFs • Has a **proprietary algorithm to calculate loan applicant's creditworthiness and the maximum loan they should receive** • **Shares the information with the loan provider** who then decides if and how much to disburse to the customer. The entire process takes 30 seconds • Able to save lenders between $12 and $16 per evaluation, has scored loans under $100 to as large as $36,000, completed 75,000+ loan evaluations in first 18 months of existence	• **Works with major MNOs in five countries to obtain loan applicant data** such as: frequency of replenishing airtime, types of data packages purchased, number of text messages sent, call timing, social network interactions, and online transaction records • Worked with Mastercard Foundation on **agricultural assessment tool** for data on farmers applying for loans

First Access has experience applying its B2C model and partnerships in MNOs and MFIs in other countries

However, it has **no known plans to enter Ethiopia** – but there are other emerging initiatives on credit scoring, e.g. **Rabobank's** use of satellite crop monitoring for credit scoring

Source: First Access website, press release and brochure; stakeholder interviews; Dalberg / AFA ecosystem study on Zambia.

Agenda

- Process update
- Summary of the ecosystem assessment
- Supporting material on the ecosystem assessment
- **Emerging technology-driven innovation**
- Appendix

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Although there are several emerging technologies that can benefit SHFs, their applications in Ethiopia are still limited

**List is non-exhaustive*

	Potential	Rationale	Potential applications
Smartphone applications	Medium	• Ethiopian smallholder farmers have limited capacity to use smartphone applications (low levels of literacy, smartphone ownership, connectivity, etc.) • However, apps can be used by third parties (ex. DAs) to collect data or to deliver services (information, extension) to smallholder farmers	• Information and extension services for SHFs (through DAs) • Logistics for access to markets for SHFs and other VC actors • Market platforms Traceability (data-entry by VC actors)
Blockchain	Low	• The use cases of Blockchain in other countries such as Kenya rely on advanced digital ecosystems, and the prevalence of mobile payments • A few Blockchain-enabled pilot projects have been launched in Ethiopia, but their results are still unknown	• Blockchain-enabled traceability and payments for SHFs and other VC actors • Credit scoring and transparent loan management
Satellites	Medium	• While SHFs lack the capacity to use digital data, using geospatial analytics in macro decisions for national-level stakeholders is more feasible • Satellites have also been used to automate micro-insurance payouts, but this services are still not commercially viable	• Satellite imagery for insurance • Data collection for macro geospatial analytics • Climate data collection to be transmitted to SHFs
Artificial intelligence	Low	• While predictive analytics could be provide tailored information (ex. feeding into projects like 8028) in the future, implementation capacity and data availability are still low	• Predictive Analytics (ex. crop performance) for SHFs and decision-makers • Yield predictions and models
Drone technology	Low	• The capacity to use drone-enabled solutions by SHFs is low • However, organized SHFs might be able use these solutions through contract farming or out-grower models in the future	• Market information (e.g. based on yield estimates) for SHFs • Alternative credit scoring

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The potential for SHFs to use mobile applications is limited, but they can be used by third parties to deliver services

Overview

Description

- Mobile applications (apps) are software programs developed for mobile devices (ex. smartphones, tablets)
- Each app provides a set of limited and isolated functionalities

Applications for SHFs

- **Information services** (ex. Commodity prices, weather information, warnings and announcements, etc.)
- **Extension services** (text, voice, video and interactive educational content)
- **Logistics for access to markets** (ex. Links with buyers, sales management, delivery/ transport coordination)
- **Platforms to order products and services**, such as inputs, agricultural machinery rentals, etc.
- **Traceability** and real-time data entry across the

Use cases

- Loop (Ethiopia): a mobile app for farm to market linkages, and allows farmers to pool their harvest, organize shared logistics and get paid electronically
- Plantwise (Ethiopia): an app that educates farmers/ DAs about plant health
- TruTrade (Kenya): an app for field agents that helps connect farmers to markets and negotiate deals

Applications in Ethiopia

Challenges in the Ethiopian context:

- Low smartphone ownership rate: 4% compared to 26% in Kenya
- Low internet penetration: 4% compared to 45% in Kenya
- Low digital literacy and familiarity with smartphones
- Most applications are in English, while smallholder farmers speak a variety of regional languages

Potential opportunities:

- Although mobile applications are used to deliver a variety of services to SHFs in other countries in the region, the digital ecosystem in Ethiopia does not yet allow for this
- However, mobile and tablet apps can be used by third parties to reach SHFs (ex. trained DAs)

Sources: ECADF; GSMA; Dalberg analysis

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Blockchain technology has several applications in the agriculture sector, which remain to be tested in Ethiopia

Overview

Description

- A Blockchain is a "time-stamped series of immutable record of data that is managed by cluster of computers not owned by any single entity"
- There are 3 types of networks: (i) consortium: verification and additions are based on a consensus mechanism; (ii) private: controlled by a centralized entity; and (iii) public: decentralized and public

Applications for SHFs

- **Traceability:** Blockchain can provide immutable records of products from the inputs to the retail stage
- **Internet-Of-Things & Quality Control**: Sensors can be used to collect data (ex. temperature control for storage), which is compiled in a big data cloud
- **Blockchain enabled payments:** lower cost and faster payments, that can be triggered by "smart contracts"
- **Credit scoring** and transparent loan management

Use cases

- Coffee traceability pilot (Ethiopia): the WFP is piloting a project that uses Blockchain for traceability
- Twiga (Kenya): uses Blockchain to track transactions, assign credit scores and manage the lending process
- IBM/ Hello Tractor digital wallet (Kenya): a Blockchain enabled and AI-based decision support platform

Applications in Ethiopia

Challenges in the Ethiopian context:

- Limited digital and physical infrastructure
- Low levels of digital literacy
- Connectivity issues in rural areas
- Limited familiarity with Blockchain, resulting in a lack of trust
- Regulatory uncertainties

Potential opportunities:

- The use cases of Blockchain in other countries such as Kenya rely on an advanced digital ecosystem, and the prevalence of mobile payments
- Blockchain pilots in Ethiopia have not yet produced results, which would show their level of success, cost of implementation, operational feasibility, etc.

Sources: FAO; Zenesys; AgFunder; Stakeholder interviews; Dalberg analysis

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Satellites can generate data that can potentially be valuable for SHFs, especially if used by decision-makers

Overview

Description

- Among other functions, satellites are used to enable communication systems and transmissions, as well as data collection (mapping and satellite imagery, collection of climate data, etc.)

Applications for SHFs

- Precision agriculture: satellite imagery allows for data collection (ex. calculations of yields and livestock biomass), that enables data-driven decision-making
- Index insurance: satellite imagery is used to trigger insurance payouts, using a “greenness index”
- Extension services: satellites can facilitate the transmission and receipt of agriculture information
- Weather forecasts and climate data collection for SHFs

Use cases

- Yazmi (Ethiopia): Yazmi uses satellites to deliver agricultural information to smallholder farmers
- WFP SIIPE (Ethiopia): satellite imagery is used to assess rainfall and trigger insurance payouts to SHFs
- Awhere (Ethiopia): delivery of weather related data
- Satellite Assisted Pastoral Resource Management (Ethiopia): vegetation maps to improve decision-making

Applications in Ethiopia

Challenges in the Ethiopian context:

- High cost of satellite technology, compared to the farmers’ low incomes and willingness to pay
- Limited digital literacy to use outputs of satellite data
- SHFs’ limited trust in high-technology solutions (ex. some SHFs’ misunderstanding of the satellite-based index insurance payout system)

Potential opportunities:

- While SHFs lack the capacity to use digital data, using geospatial analytics in macro decisions for policymakers and other national stakeholders (e.g., donors, investors) can be impactful
- Index insurance faces several challenges and remains unprofitable, but it presents an interesting existing use case

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Artificial intelligence could increase efficiency of SHFs, but requires investments in big data and data standards

Overview

Description

- Artificial intelligence (AI) is the development of software that combines problem-solving and decision-making to achieve goals
- **Predictive analytics for agriculture:** AI and Machine learning models use big data to track and predict the potential outcomes of various scenarios for farmers that ultimately increase efficiency and reduce risk

Applications for SHFs

- **Agricultural information:** probabilistic models for seasonal forecasting can provide SHFs with indications on the performance of various crops, when they should plant, weather patterns and essential input combinations
- **Yield predictions and models:** allows SHFs to plan their product distribution and overall finances

Use cases

- **Apollo Agriculture (Kenya):** use agronomic machine learning and remote sensing to deliver financing, farm products, and customized advice to SHFs
- **Tulaa (Kenya):** sends tailored agronomic advice to farmers based on location, crop and inputs purchased
- **AWhere:** combines agronomic, weather information and predictive insights to maximize crop productivity

Applications in Ethiopia

Challenges in the Ethiopian context:

- Availability of data and standards: a range of data-sets need to be collated on agronomy, climate, economics for AI systems to function effectively
- Low funding
- Limited digital and physical infrastructure
- Low data connectivity and mobile uptake rates

Potential opportunities:

- While predictive analytics could be provide more tailored information (ex. feeding into existing structures like 8028) in the future, implementation capacity and data availability are still low
- Fund local incubators like iCog who are already working on software development and R&D

Sources; Dalberg Analysis; CGIAR Platform for Big Data in Agriculture

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Drones are a viable precision agriculture-enabling technology but a require a sustainable funding model

Overview

Description

- Drones are used as a tool for precision agriculture**, providing farmers with real-time, actionable data** on their land, crop and livestock to help maximize input efficiency, minimize environmental impacts, optimize produce quality, and minimize risks.

Applications for SHFs

- **Market information:** drones can measure yield estimates and crop quality, providing market predictions that facilitates output marketing for off-takers/buyers
- **Agricultural information for precision agriculture:** imaging technology can feed into real-time updates on crop health and field management (inclu. irrigation schedules and fertilizer/pesticides application)
- **Alternative credit scoring:** loan applications complemented by drone imagery and diagnostic maps with farm data (location, size, crop type & crop health) would increase farmers' creditworthiness

Use cases

- **Equator Seeds Ltd/ TechnoServe (Uganda):** measure farm areas, estimate yields and assess crop health for 270 out-grower farms (discontinued due to high costs)
- **AgrInfo (Tanzania):** high precision aerial surveillance imagery to pre-emptively avert crop yield loss

Applications in Ethiopia

Challenges in the Ethiopian context:

- Rules and regulations around the use of Unmanned Aerial Systems , and the data collected, is unclear
- Prevailing barriers in accessing technology – cost, infrastructure and trained manpower
- Requires a sustainable funding model as SHFs have no way to fund such a significant investment themselves

Potential opportunities:

- The capacity to use drone-enabled solutions by SHFs is low
- However, there might be a viable business case for organized SHFs to use these solutions through contract farming or out-grower models
- Alternative credit scoring would require significant investment and would be difficult to scale

Sources; Dalberg analysis; AU/NEPAD report - Drones on the Horizon - Transforming Africa's Agriculture (2018)

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The SIIPE is an interesting use of satellite technology to deliver DFS, but insurance is yet to be financially viable

Description of the project

- The Satellite Index Insurance for Pastoralists (SIIPE) is a WFP project that provides livestock Asset Protection insurance for pastoralists in the Somali region
- The index-based insurance system uses satellite imagery to automatically trigger bi-yearly payouts, based on a greenness index that assesses rainfall levels

Key results achieved

- 5000 people registered with the Somali MFI in 3 woredas, 60% of whom are women
- Mobile money accounts opened, and 1M ETB in transfers

Challenges faced

- Insurance premiums are paid by WFP through community work days (PSNP system). Willingness to pay in cash and profitability are still not proven
- Pastoralists have a limited understanding of the technology
- The satellites' results took into account grass that cannot be consumed by livestock, so payouts are not triggered
- Agreements and government approvals were lengthy

Insights on the satellite technology

This technology allows insurance payout decisions to be made automatically. However, payouts were delayed when the satellite imagery took into account a variety of grass that stays green throughout the year, and cannot be used as feed

Mobile money success story

Unlike experiences in other regions, the project beneficiaries who opened mobile money accounts used them for transactions (1M ETB in 6 months) even without receiving any insurance payouts

SHFs' trust in high-technology solutions

Many pastoralists had a limited understanding of the greenness index, and expected automatic payouts

This project showcases an interesting use of satellite technology to collect proxy climate data, and automate decision-making. However, most pastoralists still pay for their insurance premiums through community work, which makes micro-insurance non-viable for private providers

Sources; Dalberg analysis; AU/NEPAD report - Drones on the Horizon - Transforming Africa's Agriculture (2018)

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Mobile and tablet app services can be delivered by third parties to reach SHFs

Existing tech in other countries

TruTrade App (Kenya)

TruTrade: provides smallholder farmers with a reliable route to market and fair prices for their produce through agent networks . On average TruTrade enables farmers to earn 20% more from their produce.

LandInfo App (multiple)

The **LandInfo App** directs farmers/extension workers to enter point-specific information about soil texture, soil properties and topography, and in turn predicts the suitability of the soil for certain crops and climatic conditions.

eSoko – Insyt App (Ghana)

Insyt provides an alternative to inefficient paper-based data collection systems, providing a simple solution to collecting data through extension workers using mobile apps.

Example of emerging tech in Ethiopia - Plantwise

CABI plantwise

CABI's Plantwise app contains a knowledge repository of plant diseases and diagnostics. Farmers visit **plant clinics** with samples of their crops and using the app extension workers diagnose and make recommendations. Plantwise has distributed 145 tablets in Ethiopia.

Challenges

- **Language barriers:** App is in English; DAs have to translate information for SHFs
- **Infrastructure barriers** (i.e. low internet penetration)
- **Pushback from regional bureaus and DAs** who don't want to use tablets/apps

Opportunities

- **Scaling:**
  - Plantwise has funding and backing from the MoA
  - Plantwise doesn't require new infrastructure as it is layered onto **existing regional extension networks** (i.e. local FTCs)

DAs and extension workers could be leveraged to provide a third party service to SHFs as a means of countering the barriers to uptake of apps by SHFs

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Sources: Stakeholder interviews, Dalberg analysis

There are emerging applications of blockchain in the agriculture sector, but they remain nascent and inconclusive

Blockchain for coffee traceability

- There are emerging initiatives to use Blockchain technology in order to improve traceability in the coffee value chain
- The World Food Program (WFP) has launched a pilot project with an Australian-based AgTech startup (AgUnity) in Jimma. The project deployed AgUnity phones and the AgUnity App to help improve trust and transparency among value chain actors
- Moyee Coffee has been running a pilot Blockchain coffee project in Ethiopia with Blockchain pioneersbext360 and the FairChain Foundation, to improve traceability and increase SHF incomes. The objective of this project is to make Moyee's coffee fully Blockchain-traceable from the washing station in Ethiopia to the retail and office customers in Europe

Government MOU with Cardano

- The Ministry of Science and Technology has signed a memorandum of understanding (MOU) with Charles Hoskinson, CEO of Cardano (ADA)
- The MOU, which was signed in May 2018, aims to enable the Ethiopian government to use Cardano's Blockchain in the domestic agriculture sector
- In addition, the agreement included a free training program for developers to apply Blockchain in Ethiopia. The first training was held from January to March 2019 and had an all-female class
- The graduates of this program will contribute to Cardano code, and help build the Blockchain agriculture applications in partnership with the government

Sources: IOF 2020; Moyee Coffee; MOST; The Reporter Ethiopia; Stakeholder interviews; Dalberg analysis

Agenda

- Process update
- Summary of the ecosystem assessment
- Supporting material on the ecosystem assessment
- Emerging technology-driven innovation
- **Appendix**

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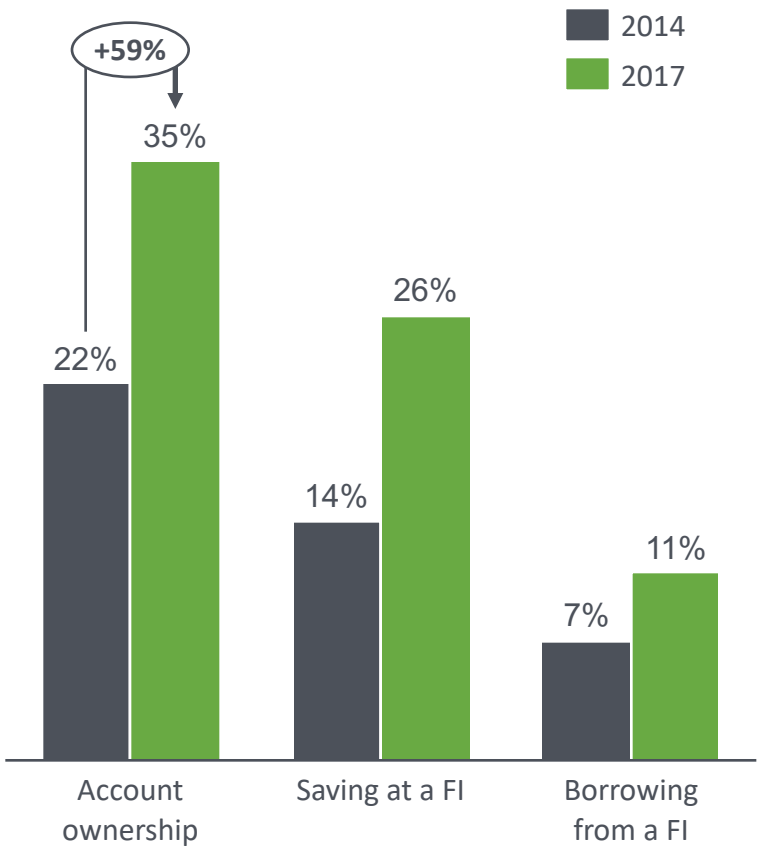
The largest donor programs within the digital ag space include the WFP and World Bank programs

Major donors*	Engagement Description
WFP World Food Programme	• Through the R4 Rural Resilience Initiative, WFP enables vulnerable rural households to increase their food and income security in the face of increasing climate risk. R4 combines improved resource management, insurance, livelihoods diversification and microcredit, and savings. • Through the Livelihoods, Early Assessment and Protection project (LEAP) system, WFP helped the government develop and deploy PSNP.
EUROPEAN COMMISSION	• Funds Climate Smart Technology (CTA) and Farm Africa to help smallholder farmers to adapt to climate change through adoption of climate-smart technologies and practices, including the provision of ICT based weather and market information.
THE WORLD BANK IBRD • IDA | WORLD BANK GROUP	• The WBs main initiative is the development of the Second Agricultural Growth Project (AGP2) which aims to increase agricultural productivity and commercialization of smallholders farmers. • The project has five key components that aim to increase: access to public support services, irrigation, markets, project management & capacity building, and demand-driven agricultural technologies
USAID FROM THE AMERICAN PEOPLE	• The Livelihoods for Resilience program is implemented by a consortium under the leadership of CARE. The goal of the project is to reduce food insecurity and increase resilience for 65,000 families in 27 PSNP woredas of Amhara, SNNPR, and Tigray.
AGRA Growing Africa's Agriculture	• Through their 2017-2012 Ethiopia strategy, AGRA is looking to scale up system and farmer level initiatives in four regions by: 1) Strengthening input supply systems and linkages to output markets; 2) Enhancing input distribution and accessibility through electronic voucher systems; 3) Expanded market access through value addition, structured trade, quality enhancement and aggregation.
MERCY CORPS	• MC's Pastoralist Areas Resilience Improvement through Market Expansion (PRIME) program supports pastoralists via market expansion and long term behavior change. It also integrates strategies aimed at helping communities become more resilient to climate change

Source: ATA Investment Mapping tool; Stakeholder Interviews;
**more exhaustive list on excel donor mapping

Ethiopia has achieved considerable progress in financial inclusion, supported by government initiatives

Financial inclusion metrics between 2014 and 2017 (% of population over 15)



- A series of **targeted initiatives** coupled with **high economic growth** may explain the **59% increase in financial inclusion metrics** between 2014 and 2017.
- Ethiopia's economy has been growing at an **average of 10.3%** between 2006/7 and 2016/17.
- The government has prioritized this issue – launching a national financial inclusion strategy in 2017, which sets a broad government vision and ambitious targets to increase financial inclusion
- The strategy creates a National Council for financial inclusion – signifying a clear mission and set of priorities that seek to:
  - I. Increase transaction accounts
  - II. Ensure that 80% of adults live within 5km of a financial institution by 2020
  - III. Increase the use of electronic instruments
  - **IV. Increase the proportion of agricultural loans from 10.4% (2016) to 15% (2020)**

Source: Global Findex 2017, Financial inclusion strategy 2017, World Bank statistics

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Examples of service providers for Ethiopian start-ups and entrepreneurs

Actor/ program	Type(s) of support	Description
Ice Addis	• BDS • Mentorship and training • Co-working space	IceAddis is a **co-working and start-up space**, which supports innovative project ideas that are related to local demands and development. The incubator was established in 2001, and provides founders (mainly young university graduates) with office space, mentors and trainings to successfully run their businesses
BlueMoon	• BDS • Mentorship and training • Co-working space • Seed funding	BlueMoon is Ethiopia's first **youth agribusiness incubator**. Twice a year, they select up to 10 startup teams of 2 to 3 entrepreneurs, who participate in a 4-month incubator program. Entrepreneurs receive coaching and mentoring, business development services, office space, as well as seed funding (200,000 ETB)
xHub	• BDS • Mentorship and training • Co-working space	xHub is an **incubation center for social entrepreneurship**. The center selects young entrepreneurs, and offers them logistical assistance such as internet access and working space, as well as BDS, mentorship, and networking opportunities
iCog Labs	• Competition for young IT entrepreneurs	iCog Labs is a research and development company that focuses on advanced AI and on the use of cutting-edge technology to help leapfrog Africa into the future. One of iCog's programs is SOLVE IT, an **annual nationwide innovation competition** for young Ethiopians who are interested in IT entrepreneurship
DCA	• Funding for established businesses	USAID's Development Credit Authority (DCA) is a program that offers **partial credit guarantees** that cover either a single loan or a loan portfolio in order to **motivate private commercial banks to lend to SMEs**, new sectors or new clients. In Ethiopia, DCA has focused mainly on providing loan portfolio guarantees (LPGs) for firms in the agricultural value chain and the health sector

Sources: IceAddis; BlueMoon; xHub Addis; iCog Labs SOLVE IT; USAID DCA Ethiopia evaluation

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Our desk research explored the following studies, covering a range of themes

Report	Sponsors	Year	Topics covered
Results of the 2012 ATA Baseline Survey	International Food Policy Research Institute (IFPRI)	2013	Describes main results of the survey on a range of key indicators: crop production and yields, agricultural inputs, agronomic practices, crop marketing, cooperatives, irrigation, access to services etc.
LSMS—Integrated Surveys on Agriculture Ethiopia Socioeconomic Survey (ESS)	World Bank	2017	Nationally representative survey of over 5,000 households living in rural and urban areas.
Assessment of Transaction Pools For Digital Financial Services Sector in Ethiopia	Enterprise Partners	2017	Investigates current and potential Digital Financial Services transaction volumes and values through a primary potential users research with a view to recommend how to stimulate uptake and scaling of Digital Financial Services.
Opportunities and challenges for microinsurance: An analysis of the supply, demand and regulatory environment	CENFRI – the Center for Financial Inclusion and Regulation	2010	Information base of the current market dynamics of microinsurance and an assessment of the opportunities and challenges.
Ethiopia: National Financial Inclusion Strategy	National Bank of Ethiopia	2017	Details Ethiopia's financial inclusion strategy, including the state of the sector, key challenges & underlying causes. Then outlines plans for the formation of a new Commission and specific targets.
Ethiopia Credit pilot deep dive study	ICCO Cooperation; MasterCard Rural and Agricultural Finance Learning Hub	2018	Investigates differences in the uptake and impact of newly developed agricultural credit products on smallholder farmers in Ethiopia.
Global Findex Database	World Bank	2017	Comprehensive data set on how adults save, borrow, make payments, and manage risk
Regulation of Mobile and Agent Banking Services Directives No. FIS /01/2012	National Bank of Ethiopia	2012	Outlines limits on transactions, agent due diligence, criterion and oversight mechanisms.
Customer Due Diligence of Banks Directives No. SBB/46/2010	National Bank of Ethiopia	2010	Outlines customer compliance, due diligence, KYCs and oversight mechanisms

Farmers interact with a range of financial services; this section generally focuses on availability of formal products

Financial tools

	Self	Friends / family	Informal FSP	Formal FSP
Savings	Home savings	Holding money for each other	Savings group / iqub	Bank account; mobile money wallet
Loans	N/A	Interest-free loan from friend/ family	Money-lender	Installment loan
Insurance	Self-insurance through owns savings	Gift from social networks to cover an emergency	Idir (community burial association), informal group	Life insurance
Transactions (remittances/ payments)	N/A	Cash gift through remittance	Money transfer through local buses	Mobile money transfer

Source: Central Statistical Agency (Integrated Surveys on Agriculture Socioeconomic Survey, 2015/16); Dalberg analysis.

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