The GSMA AgriTech Toolkit for the Digitisation of Agricultural Value Chains

March 2020

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The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with nearly 400 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces the industry-leading MWC events held annually in Barcelona, Los Angeles and Shanghai, as well as the Mobile 360 Series of regional conferences.

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The GSMA AgriTech Programme works towards equitable and sustainable food chains that empower farmers and strengthen local economies. We bring together and support the mobile industry, agricultural sector stakeholders, innovators and investors in the agritech space to launch, improve and scale impactful and commercially viable digital solutions for smallholder farmers in the developing world.

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Introduction: digitising agricultural value chains promotes financial inclusion for farmers

3 Prerequisites to digitising the agricultural last mile

1 The business case for MNOs and mobile money providers to invest in last mile digitisation

4 The GSMA Value Chain Assessment Tool (VCAT)

2 The business case for agribusinesses to invest in last mile digitisation

5 Digital footprints and economic identities for farmers

Introduction: digitising agricultural value chains promotes financial inclusion for farmers

March 2020

Introducing the GSMA AgriTech Toolkit

The Toolkit for the Digitisation of Agricultural Value Chains is a collection of resources that illustrate how digital technologies can address pain points in the agricultural last mile for farmers and value chain[1] actors, such as agribusinesses and cooperatives.[2] These resources support the use of digital technologies for digital procurement by enabling the transition from paper to digital for a range of systems and processes in the last mile. The toolkit explains how digitising the last mile offers a pathway to financial inclusion for farmers.

THE TOOLKIT CONSISTS OF AN INTRODUCTION AND THE FOLLOWING FIVE CHAPTERS

1. The business case for MNOs and mobile money providers to invest in last mile digitisation
2. The business case for agribusinesses to invest in last mile digitisation
3. Prerequisites to digitising to agricultural last mile
4. The GSMA Value Chain Assessment Tool (VCAT)
5. Digital footprints and economic identities for farmers

TARGET AUDIENCES

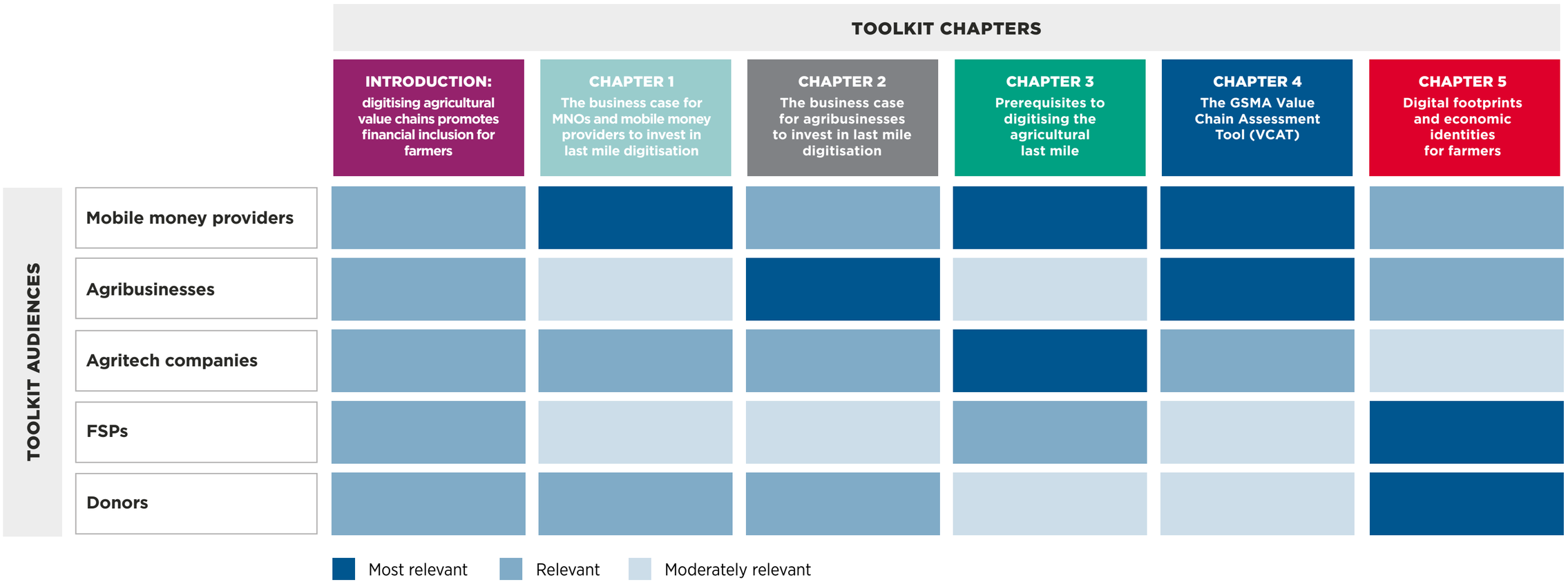
The toolkit targets diverse audiences, including mobile money providers and MNOs seeking to diversify activities and develop a rural growth strategy; agribusinesses and cooperatives interested in trialling digital technologies to address inefficiencies in their procurement activities; agritech companies looking to expand their value proposition with the integration of mobile money; financial services providers (FSPs) pursuing expansion of their business models to target farmers with customised products and services; and donors and impact investors aiming to improve financial inclusion for farmers.

1. "Agricultural value chain" refers to the full range of activities and flows of products, information and money that aim to add value to a raw agricultural product and link farmers to end consumers.
2. In agricultural value chains, the "last mile" is the web of relationships and transactions between buyers of crops, such as agribusinesses, cooperatives and middlemen, and the farmers who produce and sell them.

Toolkit user guide

The toolkit is designed to be read either start to finish, or as individual chapters if one is working through a particular challenge. Although each chapter may be more relevant to specific audiences, readers will benefit from reading the report in its entirety.

Figure 1 **Relevance of toolkit chapters for different audiences**



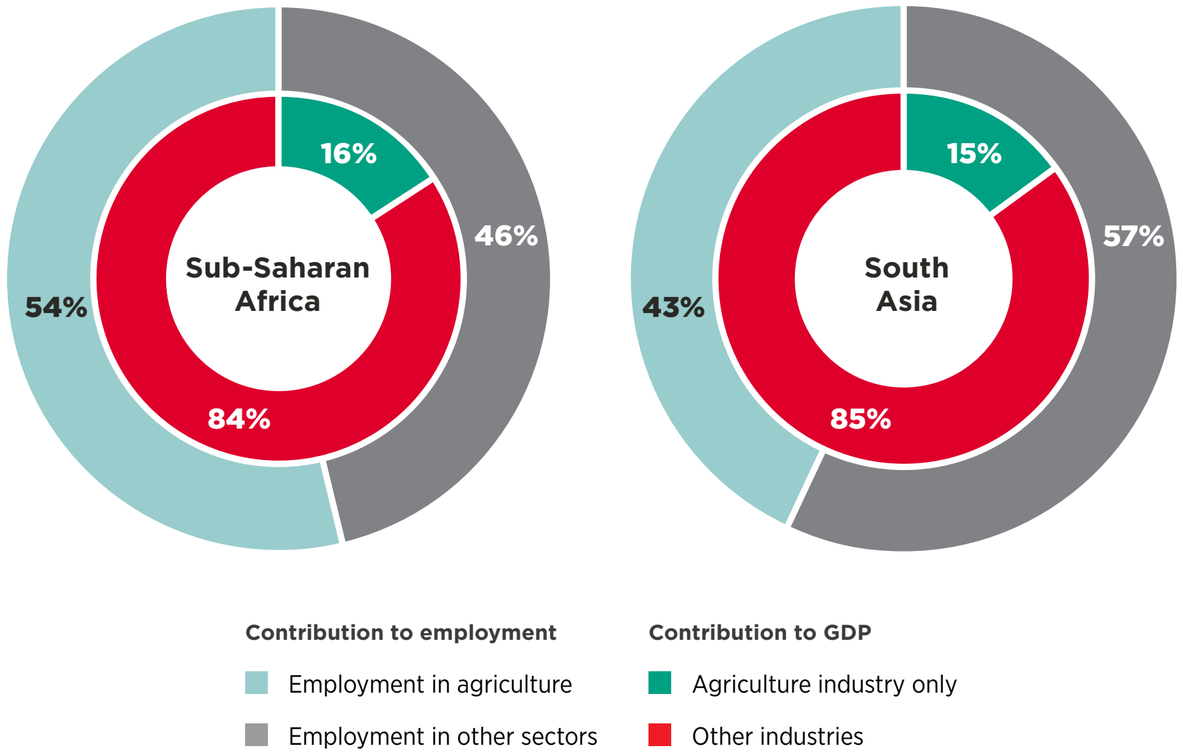
Agriculture is vital to the economies of low and middle-income countries

In developing countries, agriculture is often the main employer. An average of 33 per cent of the labour force across low- and middle-income countries (LMICs) is typically employed in agriculture.[3] Agriculture's contribution to total employment is significantly higher in Sub-Saharan Africa and South Asia.

The agriculture, forestry and fishing sector is one of the main contributors to Gross Domestic Product (GDP). Although agriculture's average contribution to GDP in LMICs is eight per cent, the sector plays a greater role in economic activities in certain regions.[4]

The vast majority of agribusinesses, including major corporations in the food and beverage industries, procure from smallholder farmers in LMICs, where about 1.3 billion people are employed in agriculture and involved in the production of the majority of the world's food.[5]

Figure 2 **Agriculture's contribution to employment and GDP[3]**



3. The World Bank (2019). Available at: https://data.worldbank.org/
4. Ibid
5. GSMA AgriTech, (2018), Opportunities in agricultural value chain digitisation: Learnings from Ghana.

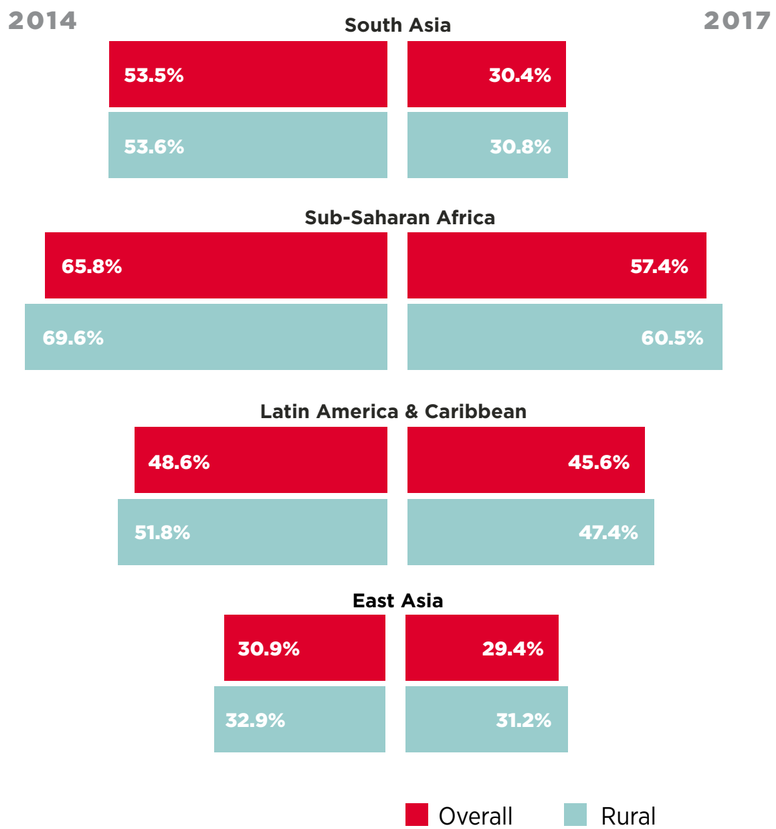
Smallholder farmers are still more likely to be financially excluded

There are 450 to 500 million smallholder farmer households worldwide, comprising around 50 per cent of the labour force in developing countries. Smallholder farmers are responsible for 80 per cent of food consumed in much of Sub-Saharan Africa and South Asia.

In commercial value chains, agribusinesses and cooperatives buy crops from smallholder farmers, relying heavily on cash payments for procurement. Governments tend to distribute subsidies through traditional mechanisms, such as vouchers for fertiliser or seed.

Although cash transactions are declining, there is still a wide financial access gap in rural areas in LMICs. Most smallholders who live in rural areas are still likely to be unbanked or have limited access to formal financial services.

Figure 3 **Percentage of financially excluded adults (age 15 and over)[6]**

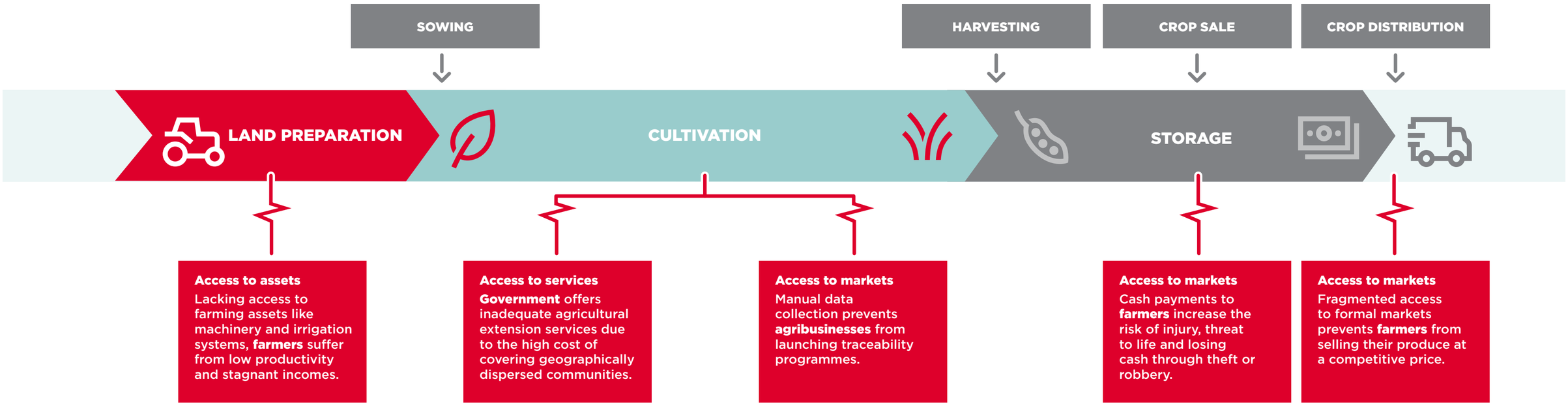


6. The World Bank, (2018), Global Findex Database 2017.

Value chain actors face inefficiencies at every stage of commodity sourcing

In agricultural value chains, commodity sourcing happens in the last mile where buyers of crops (agribusinesses) interact with the producers of crops (farmers). Traditionally, value chain actors have faced a wide variety of inefficiencies and bottlenecks that have affected yield, increased the cost of production and had a direct hit on farmer livelihoods. Handling procurement on paper and in cash increases the risks of theft and fraud, increases the time and travel required to receive cash payments for crops and creates an overall lack of transparency for buyers and producers. In such value chains, farmers lack a formal saving mechanism that would allow them to reinvest in their farms and improve yields and crop quality.

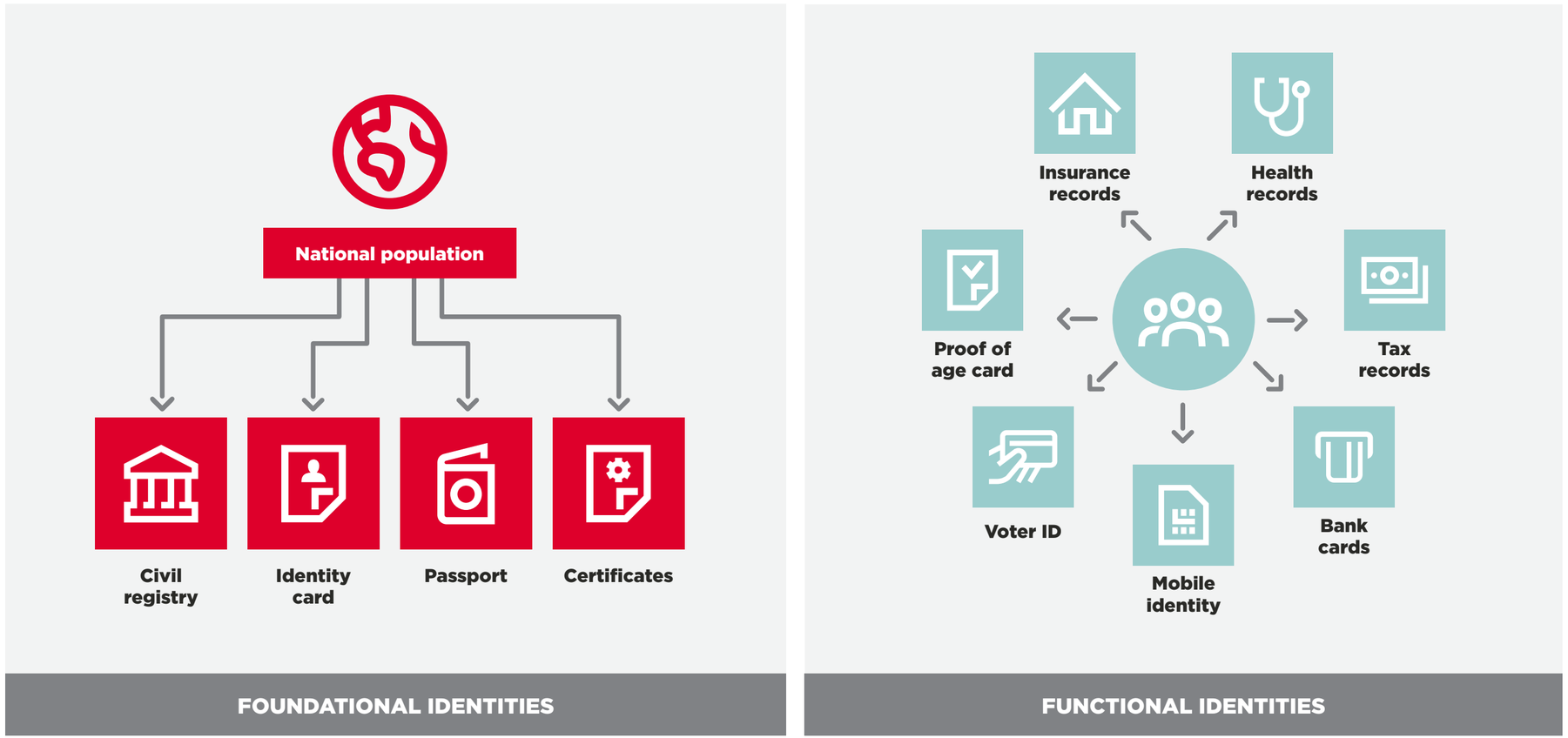
Figure 4 **Examples of inefficiencies in different stages of traditional value chains**



Lacking access to economic identities, farmers remain financially excluded

Without a formal saving mechanism, farmers require financing for both agricultural and non-agricultural activities. However, to access credit from formal channels, farmers need economic identities, which most do not have. In contrast to foundational identities — government-issued documents like identity cards, passports or birth certificates — economic identities are a form of functional identity that enables financial institutions to use innovative credit scoring models that assess the credit risk of previously unbanked farmers and their ability to repay loans.[7]

Figure 5 **Foundational and functional identities**



7. GSMA AgriTech, (2019), AgTech Innovation Unlocks Economic Identities for Smallholder Farmers in Indonesia.

Digital agriculture solutions: six main use cases

Digital technologies allow agricultural stakeholders to mitigate some of the challenges they face in agricultural production. The GSMA has grouped digital agriculture solutions into **three categories** based on the problem they solve for farmers.[8] **Access to markets** improves linkages to formal crop buyers, allowing farmers to bypass multiple intermediaries and making procurement more equitable. **Access to assets**, particularly farm assets and equipment, increases productivity and farmers' incomes. **Access to services** strengthens farmers' resilience and improves access to financial services.

Figure 6 **Six use cases for digital agriculture solutions**

ACCESS TO MARKETS		
	Digital procurement	Roll out of digital technologies in the agricultural last mile that enable a range of systems and processes to transition from paper to digital.
	Agricultural e-commerce	Online buying and selling of agricultural produce that allows farmers to reach new markets, including international buyers.
ACCESS TO ASSETS		
	Smart farming	Use of digital channels, such as the Internet of Things (IoT), to automatically and remotely access farm equipment and farming assets and track key parameters.

ACCESS TO SERVICES		
	Information services	Mobile-enabled dissemination of information to farmers, such as agronomic advice, market prices and certification standards.
	Weather and climate services	Provision of weather forecasts, weather-adaptive and climate-smart agronomic advice.
	Digital finance	Access to financial products and services via digital channels.

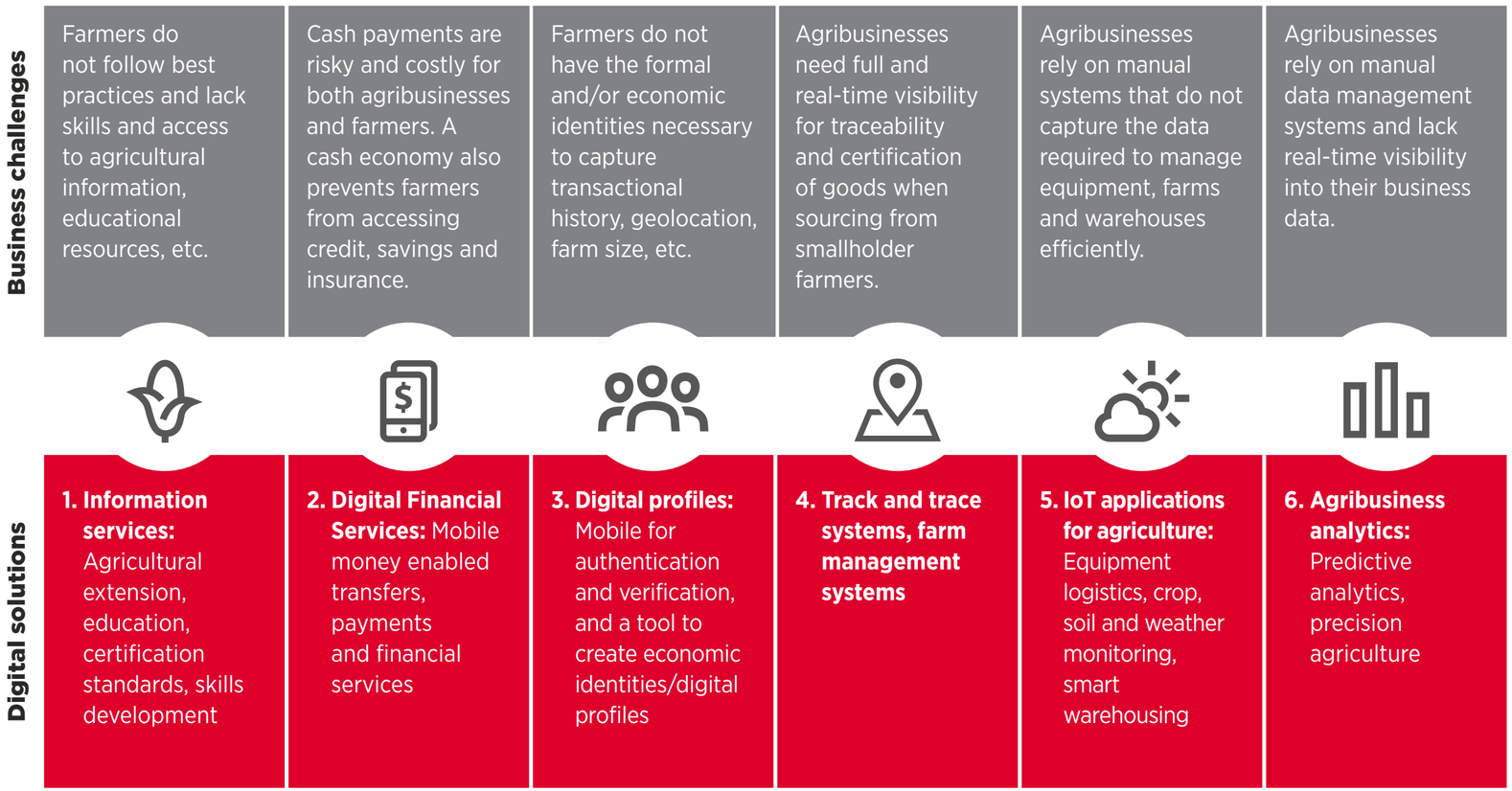
8. GSMA AgriTech, (2020), Digital credit scoring for farmers: Opportunities for agritech companies in Myanmar.

Digital procurement: digitisation can address the pain points of farmers and agribusinesses in the last mile

Digital procurement refers to the use of digital technologies in the agricultural last mile that enable a range of systems and processes to transition from paper to digital. Digital solutions have the potential to address various challenges for value chain actors.

For agribusinesses, digital technologies can help to make production more transparent, operations easier to monitor and supply chains more efficient (see Chapter 2). Farmers entering the digital ecosystem can also benefit from better access to formal markets, adoption of the latest agricultural practices and the empowerment that comes from clear terms of trade and transparent transactions.

Figure 7 **Six main types of digital solutions to optimise procurement in the last mile[9]**

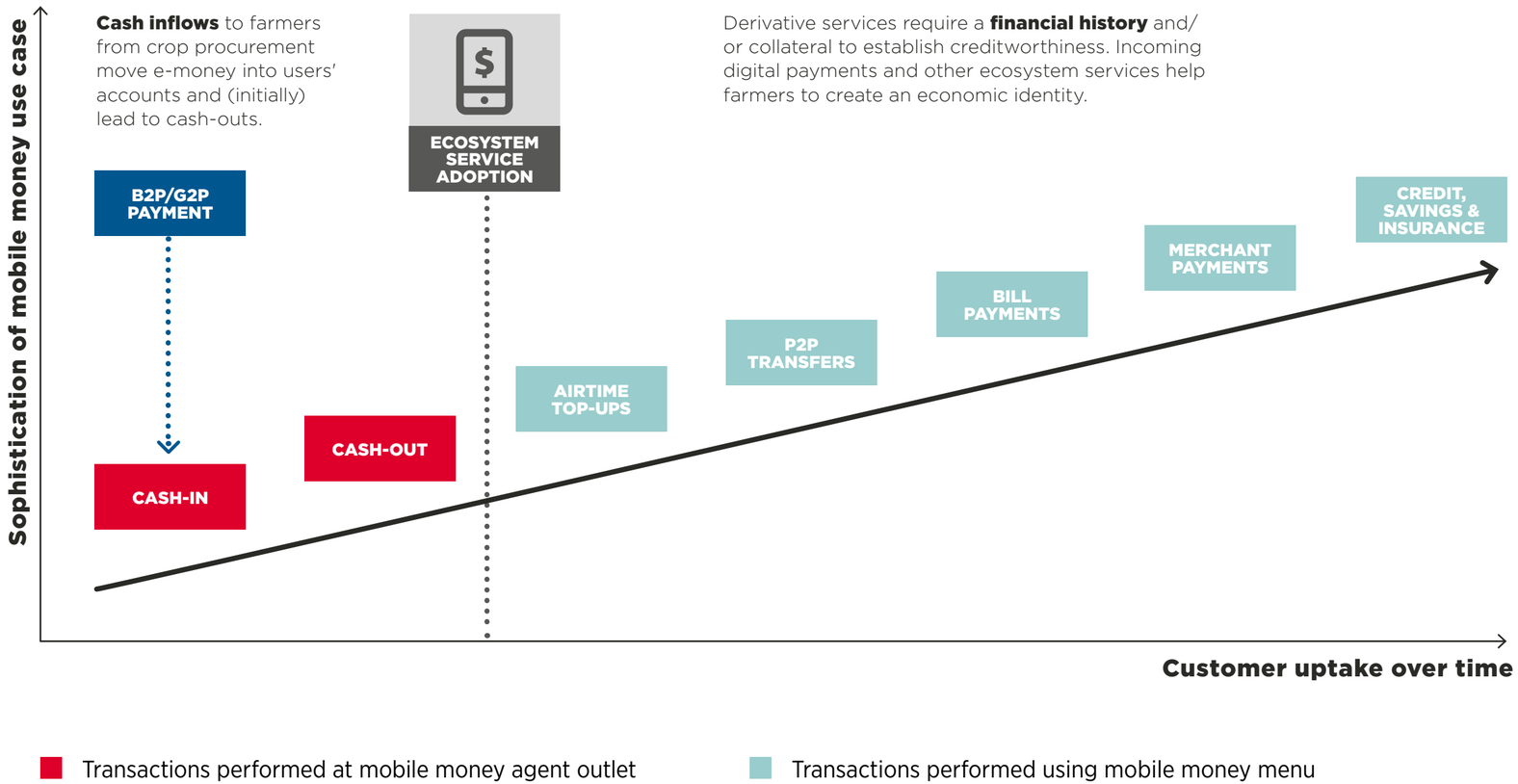


9. GSMA AgriTech, (2017), Opportunities in agricultural value chain digitisation: Learnings from Uganda.

Digitising payments to farmers through mobile money is an entry point to financial inclusion

Digital tools generate a significant volume of farm and farmer data, including financial transaction logs of the transition from cash to mobile money payments for crop procurement (business-to-person (B2P) payments). Digital transactional records, in conjunction with other data, can support the creation of economic identities and a pathway to full financial inclusion for farmers (see Chapter 5).

Figure 8 **The pathway to financial inclusion**

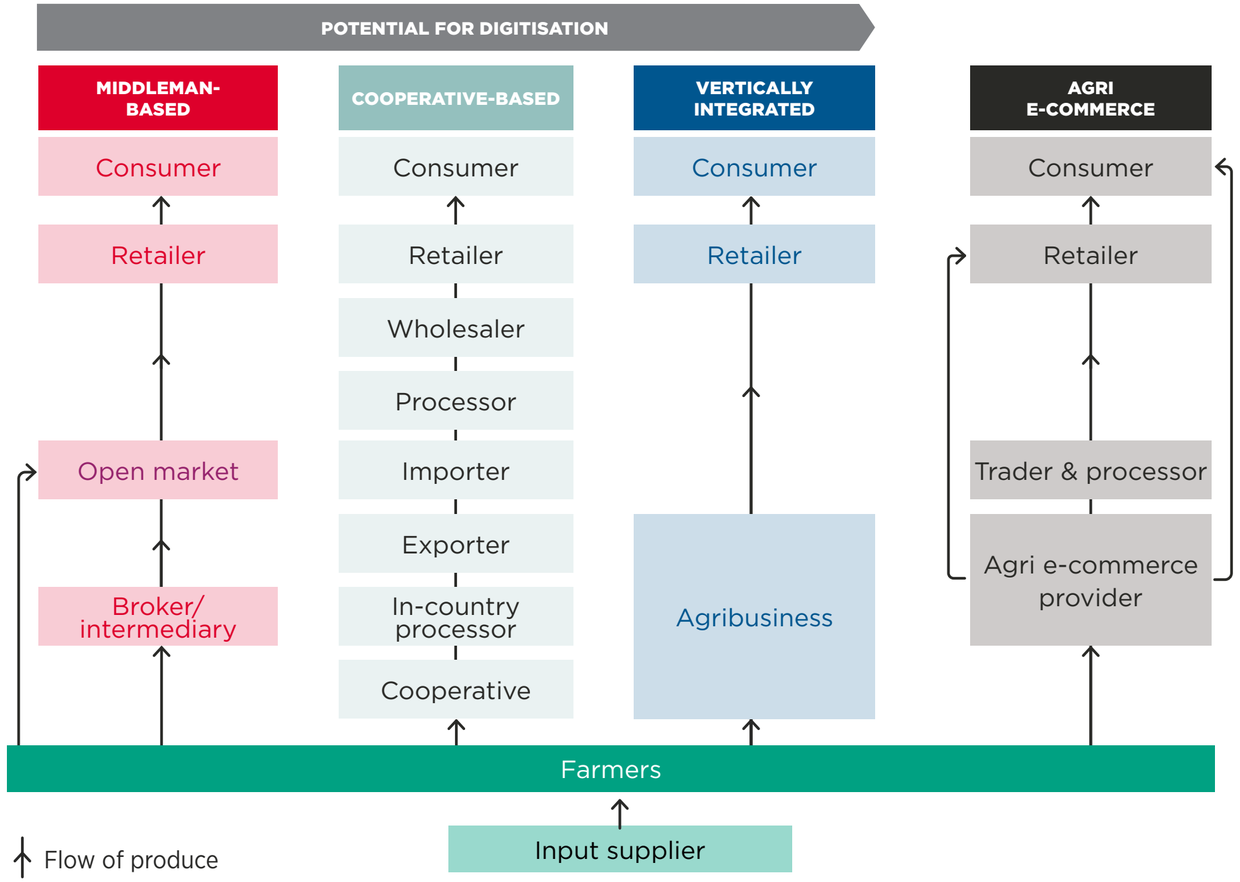


Formal value chains have the greatest potential to digitise B2P payments

In agricultural value chains, a variety of steps and actors are involved in moving crops from a farm to the end consumer. Value chains have varying degrees of formality. As opposed to informal, intermediary-based value chains that are characterised by a high degree of fragmentation in the last mile, formal value chains have stronger vertical integration and are structured around agribusinesses and cooperatives responsible for crop procurement and aggregation. In global supply chains, they provide strong incentives for buyers to improve transparency, quality and predictability of supply.[10]

Alongside traditional value chains, agri e-commerce solutions are emerging as entirely new value chain structures. These solutions help to establish formal relationships between buyers and sellers of crops through digital channels. Formal value chains and agri e-commerce represent ideal entry points for mobile money providers to digitise B2P procurement payments. To understand the systemic factors and conditions under which value chains operate in the last mile, value chain analysis becomes critical to planning digitisation initiatives (see Chapter 4).

Figure 9 **Types of agricultural value chains**

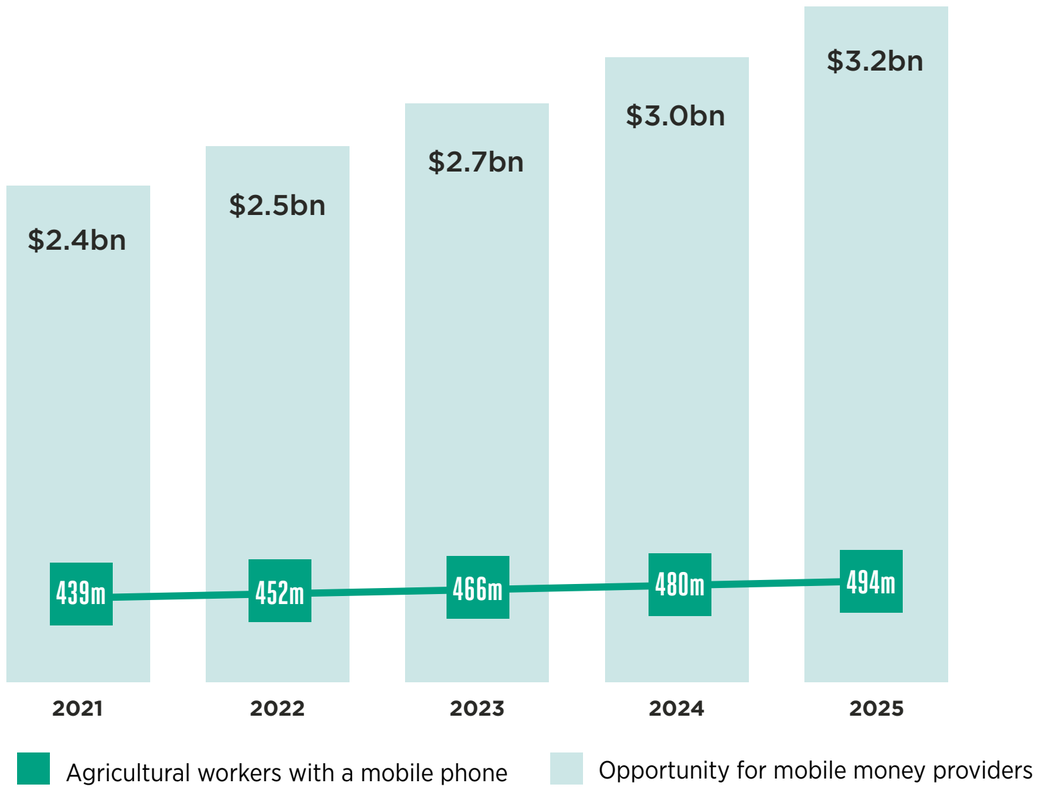


10. GSMA AgriTech, (2018), Prerequisites to digitising the agricultural last mile.

The potential mobile money revenue opportunity for B2P agricultural payments will rise to $3.2 billion by 2025

MNOs and mobile money providers have an important role to play in the digitisation of B2P payments to farmers. They can leverage their brand, scale and assets to support the development of digital enterprise solutions for agribusinesses. By doing so, they stand to capture up to $3.2 billion in total direct annual revenue by 2025 through digitising B2P payments in the agricultural last mile (see Chapter 1).[11] This revenue opportunity represents the market ceiling — the actual revenue that could be generated if mobile money providers benefit from an enabling environment (e.g. regulation with suitable transaction limits for agricultural B2P payments), have the necessary assets in place (e.g. sufficient numbers of agents and available liquidity in rural areas) and actively pursue the digitisation opportunity (see Chapter 3).

Figure 10 **Potential direct revenue opportunity (USD) and potential addressable market (millions)[12]**

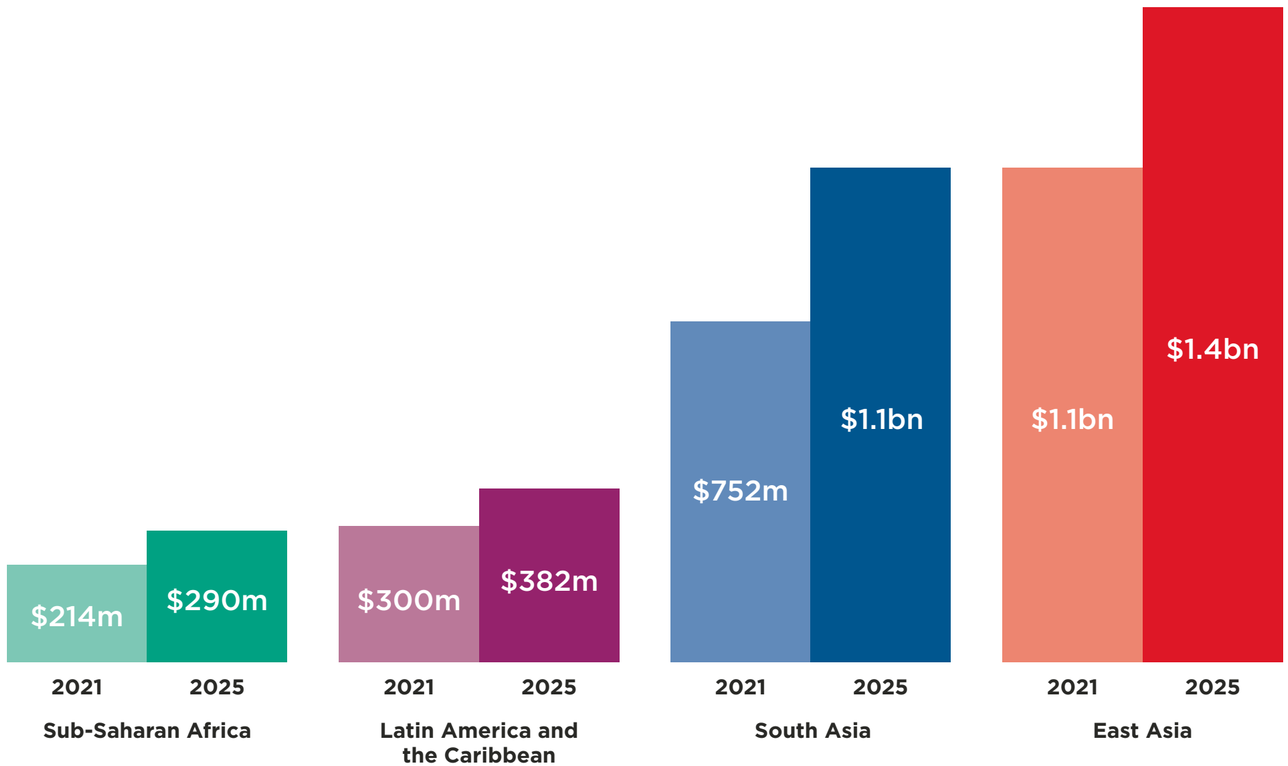


11. Across Sub-Saharan Africa, South Asia, East Asia and Pacific, Latin America and the Caribbean.
12. GSMA AgriTech, (2020), Digitising payments in agricultural value chains: The revenue opportunity to 2025.

The opportunity is concentrated in Asia, but high availability of mobile money means that Sub-Saharan Africa is ripe for digitisation

East Asia and South Asia offer almost 80 per cent of the global opportunity to digitise agricultural B2P payments. This is due to the large volume of formal agricultural B2P cash payments available for digitisation in these regions. While Sub-Saharan Africa has a comparatively smaller revenue opportunity, strong mobile money uptake, especially in East Africa and in the high-growth markets of West Africa (e.g. Ghana and Côte d'Ivoire), means that the region is ripe for digital agricultural B2P payments. Many of the early examples of digital agricultural payment services emerged in Sub-Saharan Africa.

Figure 11 **Potential direct revenue opportunity for mobile money providers by region, 2021 versus 2025**



Introducing the chapters of the GSMA AgriTech Toolkit

Chapter 1

The business case for MNOs and mobile money providers to invest in last mile digitisation

Key questions

1. What is the business case for MNOs and mobile money providers to invest in the deployment of digital technologies in the last mile?
2. What Key Performance Indicators (KPIs) can be used to assess project success?
3. What are the pros and cons of various project team structures?

Chapter 2

The business case for agribusinesses to invest in last mile digitisation

1. What is the business case for agricultural organisations to invest in the deployment of digital technologies in the last mile?
2. What pain points in agribusiness-farmer engagement do digital tools address?
3. What kind of digital tools do agribusinesses use in the procurement of crops?

Chapter 3

Prerequisites to digitising the agricultural last mile

1. How can MNOs support network expansion in rural areas and ensure adequate coverage for digitisation initiatives?
2. How can mobile money providers ensure agent networks are reliable and sufficiently liquid to support last mile payments?
3. What due diligence principles and best practices should be applied to promote uptake of last mile payments?

Chapter 4

The GSMA Value Chain Assessment Tool (VCAT)

1. What is the framework for analysing value chains and supporting digital interventions in agriculture?
2. What agricultural organisations appear most suitable for the deployment of digital tools in the last mile?
3. Why is profiling of agricultural organisations important and what indicators should it capture?

Chapter 5

Digital footprints and economic identities for farmers

1. How can digital data help farmers develop economic identities?
2. What new operational models and supporting technologies are available in the sharing of data?
3. What are the key considerations in designing financial products for farmers?

The business case for MNOs and mobile money providers to invest in last mile digitisation

March 2020

1

Introduction

What is the focus of this chapter?

This chapter makes the business case for MNOs and mobile money providers to invest in the deployment of digital technologies in the agricultural last mile, particularly those that digitise procurement payments, as these promote financial inclusion for farmers.

What types of mobile money providers is this chapter aimed at?

This chapter is aimed at mobile money providers, including MNO-led and third party-led services (banks and fintech). Some financial regulators take a conservative approach, limiting the issuance of mobile money to established financial sector players, such as commercial banks. Others permit MNOs and other non-banks to issue mobile money if they apply for a licence as an electronic money issuer. Large MNO groups still dominate Africa's mobile money ecosystem, while in Asia, fintechs and tech giants have entered the payments space and operate alongside mobile money providers.

How can MNOs and mobile money providers benefit from investing in the digitisation of the last mile?

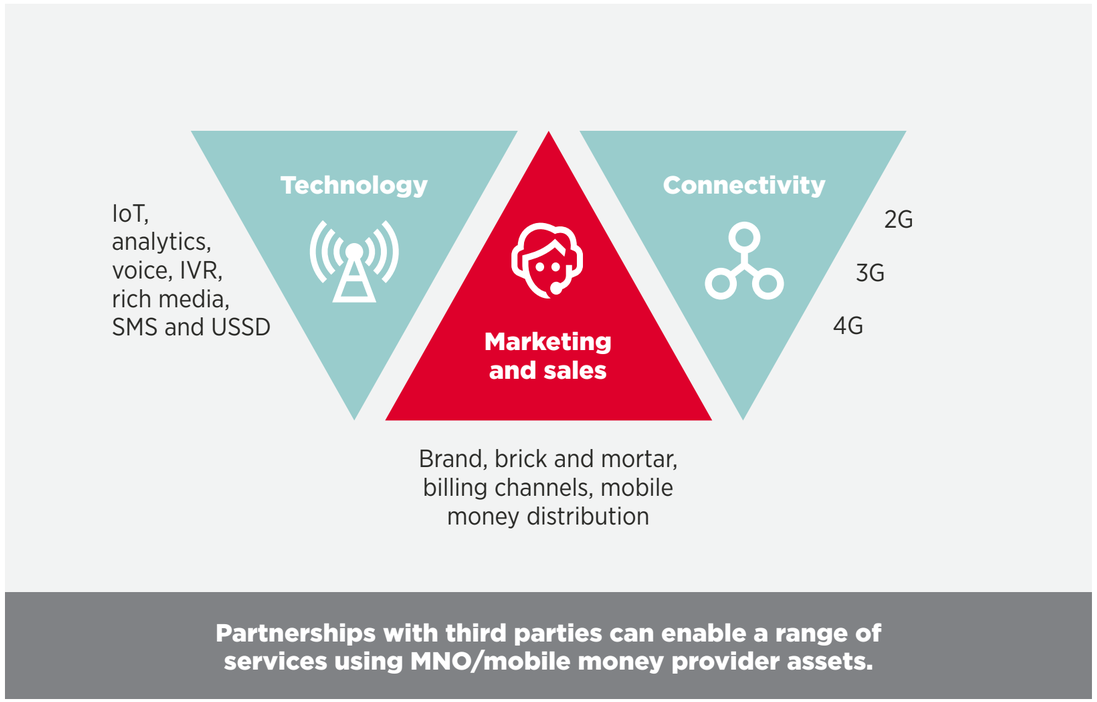
Benefits for MNOs and mobile money providers can be both direct and indirect. Examples of direct benefits include revenues from transaction fees levied for mobile money payments; the addition of new mobile money customers in rural areas and new mobile network service users; and greater loyalty or stickiness of existing users. Examples of indirect benefits include increased network use (SMS, calls, data); higher mobile money service use among existing users; and increased agent activity that can support the development of the mobile money ecosystem and uptake of adjacent products, such as loans and insurance.

MNOs and mobile money providers have a range of assets to support rural development and bridge the financial inclusion gap

Opportunity profiling

To bridge the financial inclusion gap and encourage the development of a digital rural ecosystem, MNOs and mobile money providers can leverage their existing assets. For example, they can develop services that address the challenges of procurement payments and access to financial services, as well as challenges around farmers' knowledge and transparency in the value chain.

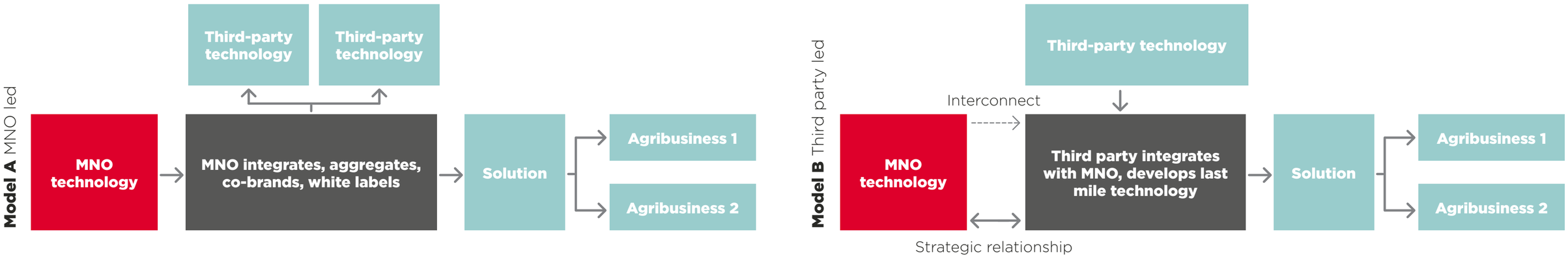
Figure 12 **MNO and mobile money provider assets**



The GSMA has identified two models for the role of MNOs in the digitisation of the agricultural last mile

Opportunity profiling

Figure 13 **Models for agricultural last mile digitisation**[13]



MNO led:
MNOs use core proprietary technology to create strategic partnerships with third parties.

- This model provides the opportunity to aggregate multiple solutions that leverage the scale and brand of an MNO to become a one-stop shop for the enterprise customer.
- However, the MNO must have the internal capacity to fund, implement and run the enterprise solution.

Third party led:
Agritech companies use the core assets of an MNO to develop a digital solution.

- This model benefits from the agility of small agritech companies to upgrade and customise solutions to the needs of enterprise customers.
- However, agritech companies must integrate core MNO assets (e.g. cellular connectivity, mobile money) to provide the solution.

With each model offering a range of benefits for the implementing parties, the choice of model should reflect the wider MNO strategy.

13. GSMA AgriTech (2017), Opportunities in agricultural value chain digitisation: Learnings from Uganda.

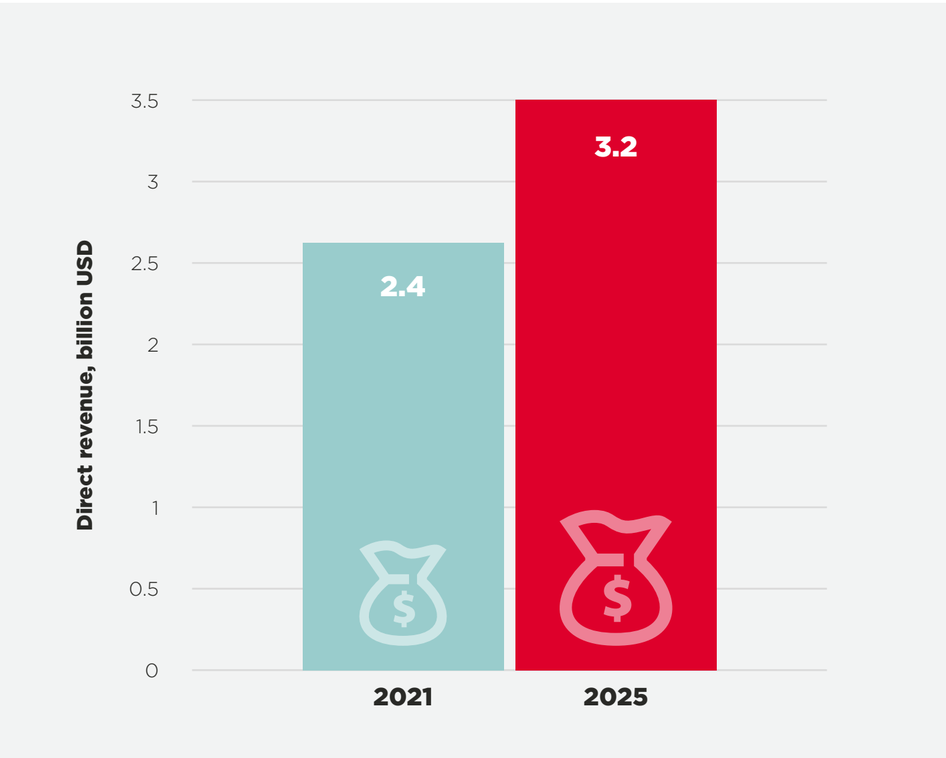
Digitising agricultural business-to-person payments could generate $3.2 billion in revenue for mobile money providers in 2025

Benefits

Solutions for digital financial services, digital procurement and information services have emerged across Africa and Asia, led by either MNOs or third parties. MNOs and mobile money providers have typically leveraged their own assets to target the agriculture sector with bulk payment solutions. However, many MNOs, including MTN Ghana and Dialog Sri Lanka, are looking beyond bulk payment solutions to develop a more holistic suite of services, from digitised farm management systems to certification and traceability, among others. To do this, many have entered into strategic partnerships with third parties with relevant assets and expertise.

For mobile money providers, digitising business-to-person (B2P) payments for crop procurement is a significant revenue opportunity and viable entry point for the digitisation of the rural ecosystem. Cash inflows for B2P payments, and subsequent ecosystem transactions from farmers' accounts, provide an opportunity for mobile money providers to drive adoption in rural areas. Over time, digital transaction data, combined with other farmer and farm data, can support the creation of economic identities for farmers. These identities, required to perform credit risk assessments, may allow farmers to access financial services like credit and insurance.

Figure 14 **Potential direct revenue opportunity (USD), 2021 versus 2025[14]**



14. GSMA AgriTech (2020), Digitising payments in agricultural value chains: The revenue opportunity to 2025.

Last mile digitisation can unlock benefits for MNOs beyond B2P transfer revenues

Benefits

Digitising payments, offering a digital procurement platform and bundling information services could provide a range of benefits for an MNO. For example, existing consumers becoming more engaged with the MNO brand, existing enterprise clients receiving additional MNO services, and entirely new consumer and enterprise clients signing on with the MNO.

Figure 15 **MNO benefits from last mile digitisation**

CONSUMER BUSINESS

- Additional direct revenue will come from farmers who perform subsequent ecosystem transactions (airtime top-up, bill payment, merchant payment, etc.)
- Indirect revenue from new mobile network users, and increased and more consistent use of the full range of mobile services available (voice, messaging, VAS).
- Services could increase customer loyalty in rural areas and reduce customer churn.

ENTERPRISE BUSINESS

- Fees from enterprises for licensing technology platforms involving supply chain management systems, such as track and trace and farm management.
- Fees from enterprises for executing bulk SMS requests.
- Fees from enterprises for executing bulk payment requests.

MINISTRIES AND GOVERNMENT

- Fees for government-to-person (G2P) disbursement of agriculture subsidies to farmers.
- Fees from licensing last mile digital tools to ministries of agriculture and regional governments that enable data collection and profile management of subsidy beneficiaries.

Digital interventions stimulate mobile money adoption and build customer loyalty

Benefits

Our research shows that farmers registered on services supported by the GSMA AgriTech programme use their mobile money wallets for use cases beyond cash out, predominantly for safe storage of funds at present. By encouraging mobile adoption through digital payments, there is an opportunity for direct revenue from subsequent ecosystem transactions.[15]

These services also appear to build MNO brands. Greater customer loyalty and less churn translate into wider benefits from core services, such as increased use of SMS, voice and data. For example, for MTN Ghana, digitising the agricultural last mile is a way to drive mobile money uptake in rural areas and to increase stickiness to core services (see slide 28).

> If today I have a bit of money, I can put it on my [mobile money account]. I even keep a lot of money there. If I have a problem I cash-out. I also store money there for my future project — do cattle breeding.

Male farmer, Côte d'Ivoire

> I will be compelled to save a lot more of my money and use it in a wise manner.

Male farmer, Ghana

> This is a geographic area that does not interest mobile operators. But [MNO] showed interest in this area. I will not hesitate to promote them to another person in the future.

Female farmer, Sri Lanka

> I would recommend [MNO] because it's a good operator that does a lot for us.

Male farmer, Côte d'Ivoire

15. GSMA AgriTech (2017), Opportunities in agricultural value chain digitisation: Learnings from Uganda.

Intelligent KPIs are needed to measure the success of last mile digitisation

MNOs need KPIs to measure whether a last mile digitisation project is achieving their business objectives. These KPIs must be intelligent enough to support innovation, yet put enough pressure on project teams to achieve results. While existing, 'generic' KPIs can be used, KPIs focused on the target market — i.e. measuring uptake and usage among targeted farmers and agribusinesses — should be agreed early on.

Figure 16 **Examples of KPIs to assess the success of last mile digitisation projects**

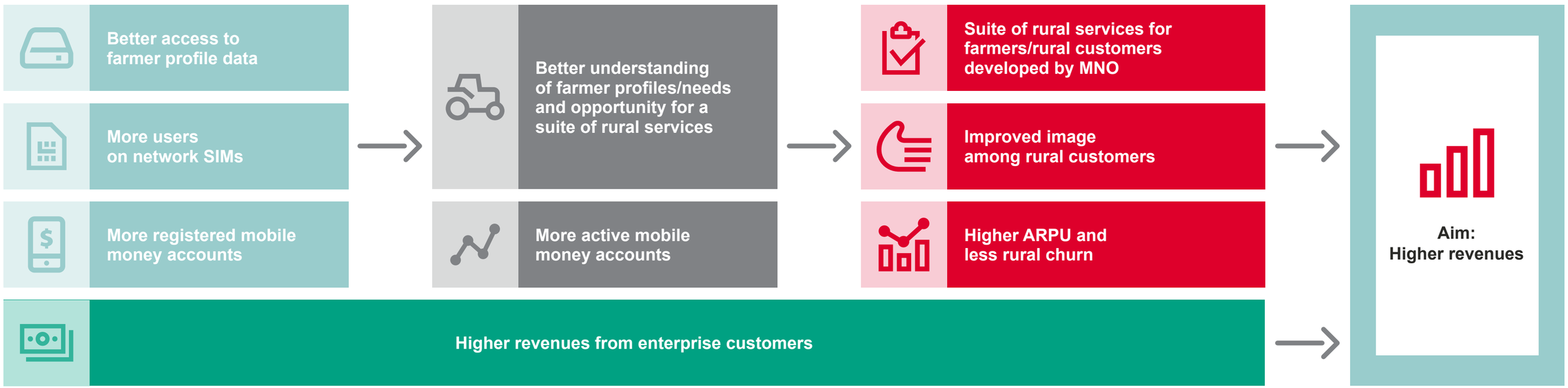
Pathway component	MOBILE MONEY GROWTH	HIGHER REVENUES	ENTERPRISE GROWTH	CUSTOMER LOYALTY AND SATISFACTION
Examples of KPIs that help quantify growth in enterprise sales and consumer revenue	• Number of new registered mobile money accounts acquired thanks to the service • Number of new active (30-day) mobile money accounts acquired thanks to the service	• Revenues from enterprise clients • MNO rural revenues • Mobile money revenues • MNO market share	• Service (direct) revenue • Number of new enterprise clients joining the service	• Service user ARPU • Service user churn • Satisfaction among rural consumers

Aligning digital tool KPIs with MNO business objectives is key to the success of any last mile digitisation project

KPIs

Ensuring a project team's KPIs are aligned with broader MNO business objectives is a key part of any digitisation initiative. Measuring business objectives against project-specific KPIs is necessary to quantify progress over time.

Figure 17 **Pathway to success for a last mile digitisation project**



For MNOs, assessing operations is the first step in implementing any digital tool

Capacity and skills

Figure 18 **Assessment of MNO readiness to implement a last mile digital tool**

Creating a digital tool requires an MNO to assess the strength of their connectivity and mobile money networks, as this will determine the business case for rural network expansion. By looking beyond traditional revenue streams, MNOs can build both their rural customer base and the business case for rural networks.

An MNO does not have to approach operations alone. There are opportunities to enter into strategic partnerships with third parties (e.g. aggregators) that have assets and expertise in areas such as rural mobile money liquidity. For example, in Uganda, Yo is an aggregator that manages a network of cash-out agents for coffee farmers and is responsible for the provision of liquidity.[17]

16. GSMA Intelligence (2015), Rural coverage: Strategies for sustainability.
17. GSMA (2018), Prerequisites to digitising the agricultural last mile.

To develop last mile digital tools, the GSMA has worked with product managers on a variety of MNO teams

Figure 19 **Comparison of project team types**

	Mobile money enterprise team	Mobile money team	Dedicated agriculture team
Pros	• Existing enterprise relationships and enterprise sales culture • Agility of the team	• Strong understanding of mobile money fundamentals	• Cross-cutting team including mobile money, GSM and agriculture experts • Aims aligned with agriculture sector
Cons	• Lacks connection with GSM business for bundled services	• KPIs strongly aligned with mobile money only	• Cost-heavy • Business case still developing
Supporting teams are also required:	• A dedicated sales team to drive the acquisition of new enterprise clients and market the solution to existing enterprise clients. • Project management support to create KPIs that reflect the commercial motivations of the MNO and to monitor the progress of these KPIs over time.		

A dedicated product manager with clear objectives and incentives is key to success.

Case study: MTN Ghana launches mAgric tool to digitise crop procurement in the last mile

Case study

MTN Ghana's mAgric is a mobile app that enables an agribusiness to record crop procurement from farmers digitally, and pay farmers for their produce instantly via mobile money. The app provides a solution for inefficient cash-based payments and the challenges of paper-based systems. Mobile money reduces farmers' travel and waiting times for payments, makes payments more secure and offers financial stability through better money management. mAgric currently targets farmers in the cocoa value chain, Ghana's most important cash crop and second-largest export commodity. MTN Ghana is expanding the use of the tool to other value chains with a pilot launched in 2019 to trial mAgric in the poultry value chain.

Key findings and recommendations

- The GSMA has identified two models for offering last mile digital tools to agribusinesses: an MNO-led model in which a mobile operator uses core proprietary technology to create strategic partnerships with third parties to offer a last mile solution directly to the agribusiness; and a third party-led model in which a tech provider integrates MNO/mobile money provider assets to develop a digital solution.

- For MNOs and mobile money providers, digitising B2P payments for crop procurement is a significant revenue opportunity and viable entry point for the digitisation of the rural ecosystem. By doing so, they stand to capture up to $3.2 billion in total direct annual revenue by 2025. However, last mile digitisation can unlock benefits beyond B2P transfer revenues, such as stimulating mobile money adoption and building customer loyalty.

- MNOs need intelligent KPIs to measure whether a last mile digitisation project is achieving their business objectives. KPIs should put enough pressure on project teams to achieve results and align with MNO business objectives to quantify progress over time.

- For an MNO, the first step in implementing any digital tool is assessing the strength of their connectivity and mobile money networks, as this will determine the business case for rural network expansion. To address operational challenges, an MNO can enter into strategic partnerships with third parties (e.g. aggregators) that have assets and expertise in areas such as rural mobile money liquidity.

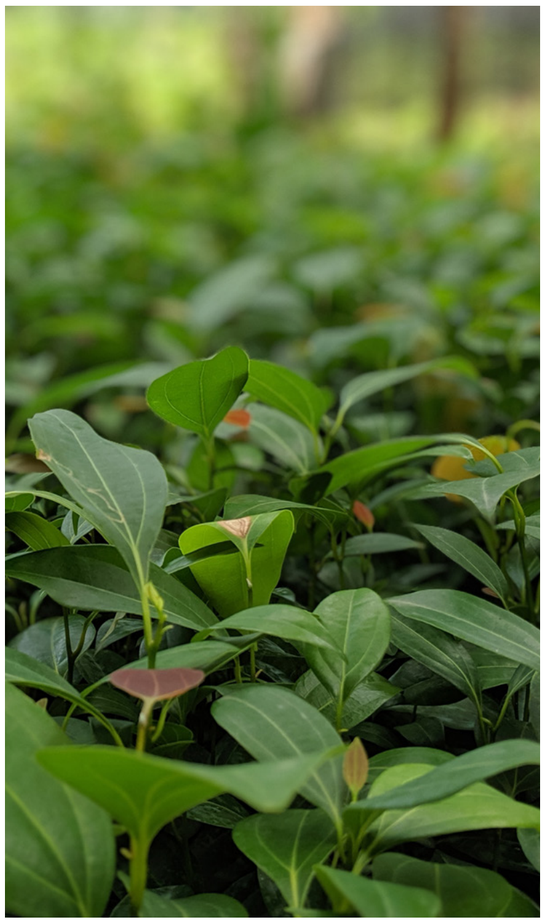
- The GSMA has worked with product managers on a variety of project teams, each with their own pros and cons. No matter the set-up, a dedicated product manager with clear objectives and incentives is key to the success of any last mile digitisation project.

The business case for agribusinesses to invest in last mile digitisation

March 2020

2

Introduction



What is the focus of this chapter?

This chapter makes the business case for agricultural organisations (i.e. agribusinesses and cooperatives) to invest in the deployment of digital technologies in the agricultural last mile. Such investment would support the transition from paper to digital for a range of processes.

What types of digital solutions are available?

There are a wealth of digital solutions to address the pain points crop buyers and producers face with last mile sourcing. These solutions include information delivered via mobile to support better agricultural practices, mobile money payments for the procurement of crops, tools to create digital profiles for farmers, track-and-trace and farm management systems, Internet of Things (IoT) applications, precision agriculture and predictive analytics tools. Holistic digital agriculture tools integrate multiple solutions to address the challenges commodity buyers face when procuring crops from farmers.

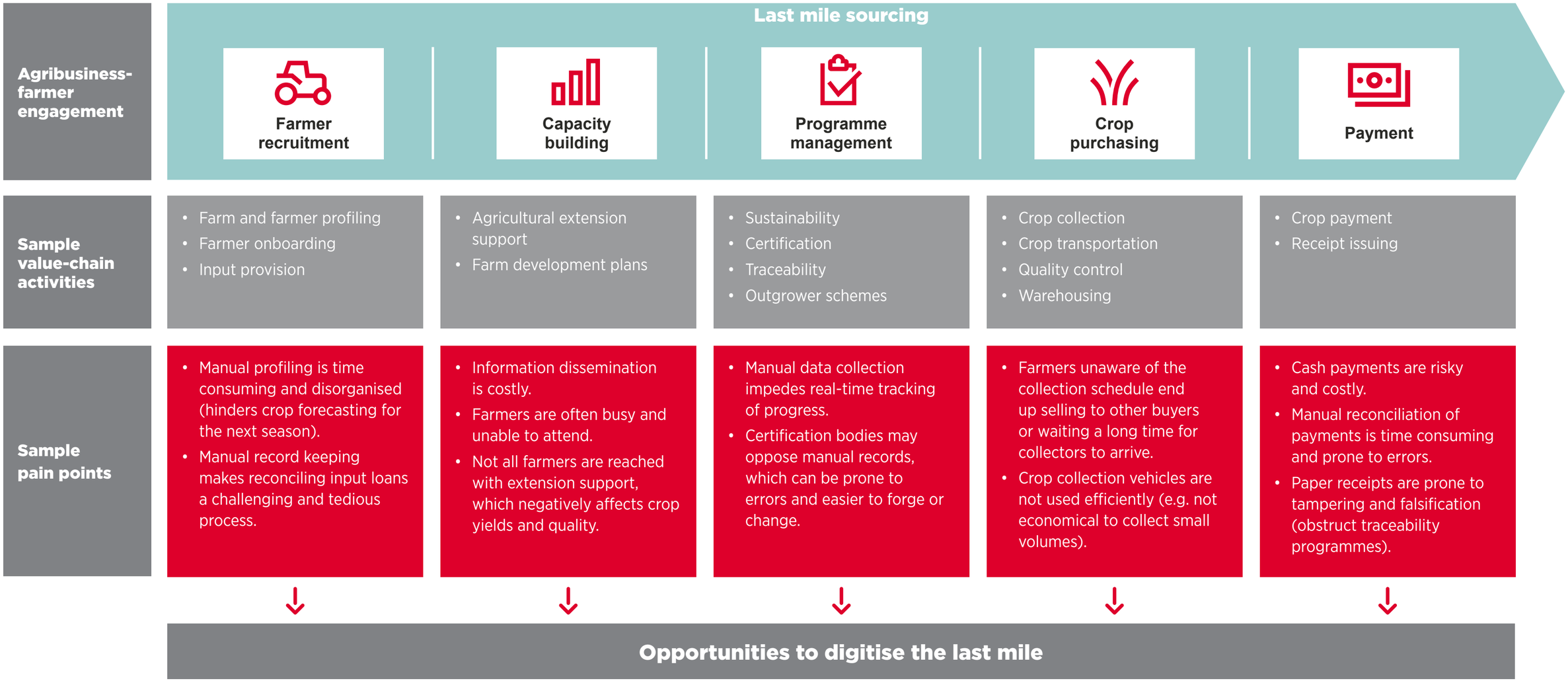
How can agricultural organisations benefit from digital technologies?

Agricultural organisations that procure crops interact with a range of actors in the value chain throughout the year. When sourcing commodities from farmers, they engage in a variety of activities, such as leading sustainability initiatives and managing end-to-end traceability of crops, rolling out field training, managing agricultural input distribution programmes and monitoring operations in the last mile. Digital solutions give agricultural organisations greater control over their operations as they allow them to monitor them more closely, provide more transparent transactions and create effective communication channels, both internally and with smallholder suppliers.

Business challenges emerge at every stage of last mile sourcing

Challenges

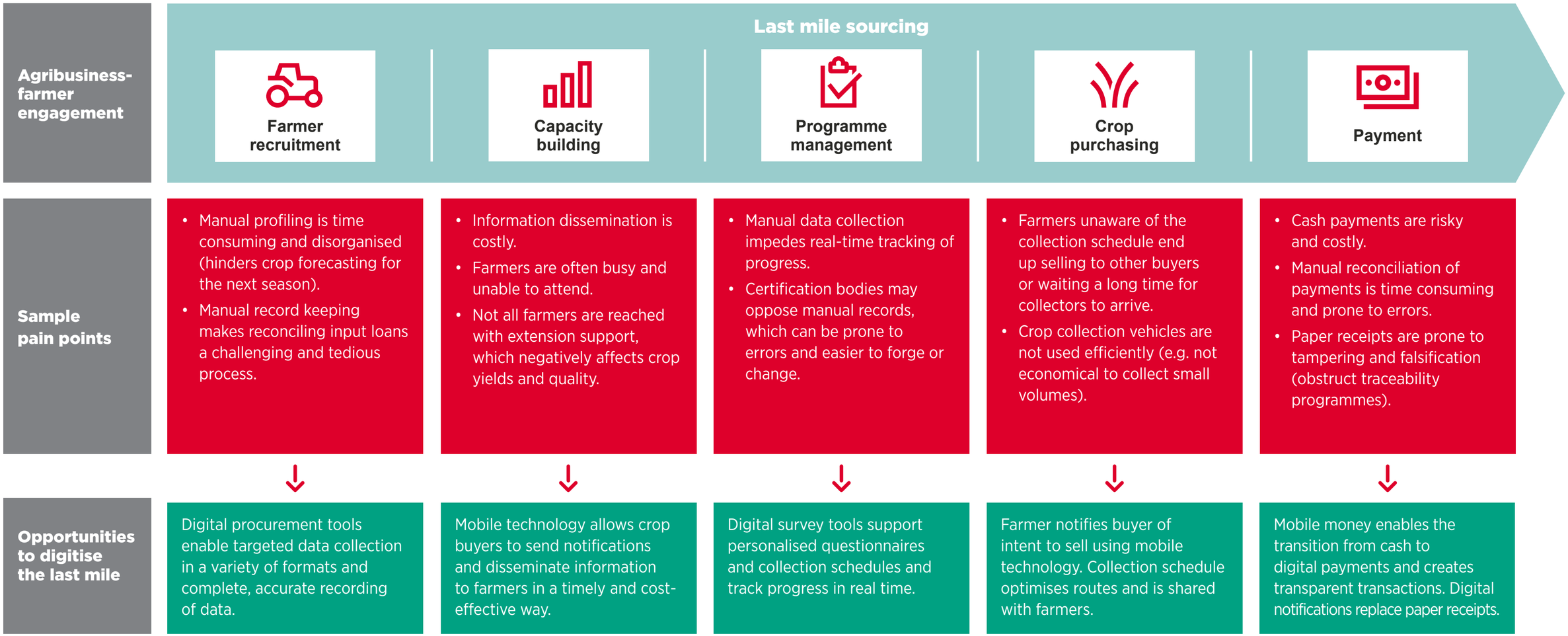
Figure 20 **Sample pain points across agribusiness-farmer engagement**



Holistic digital tools can help agricultural organisations address multiple pain points at once

Benefits

Figure 21 **Opportunities to digitise the last mile across agribusiness-farmer engagement**



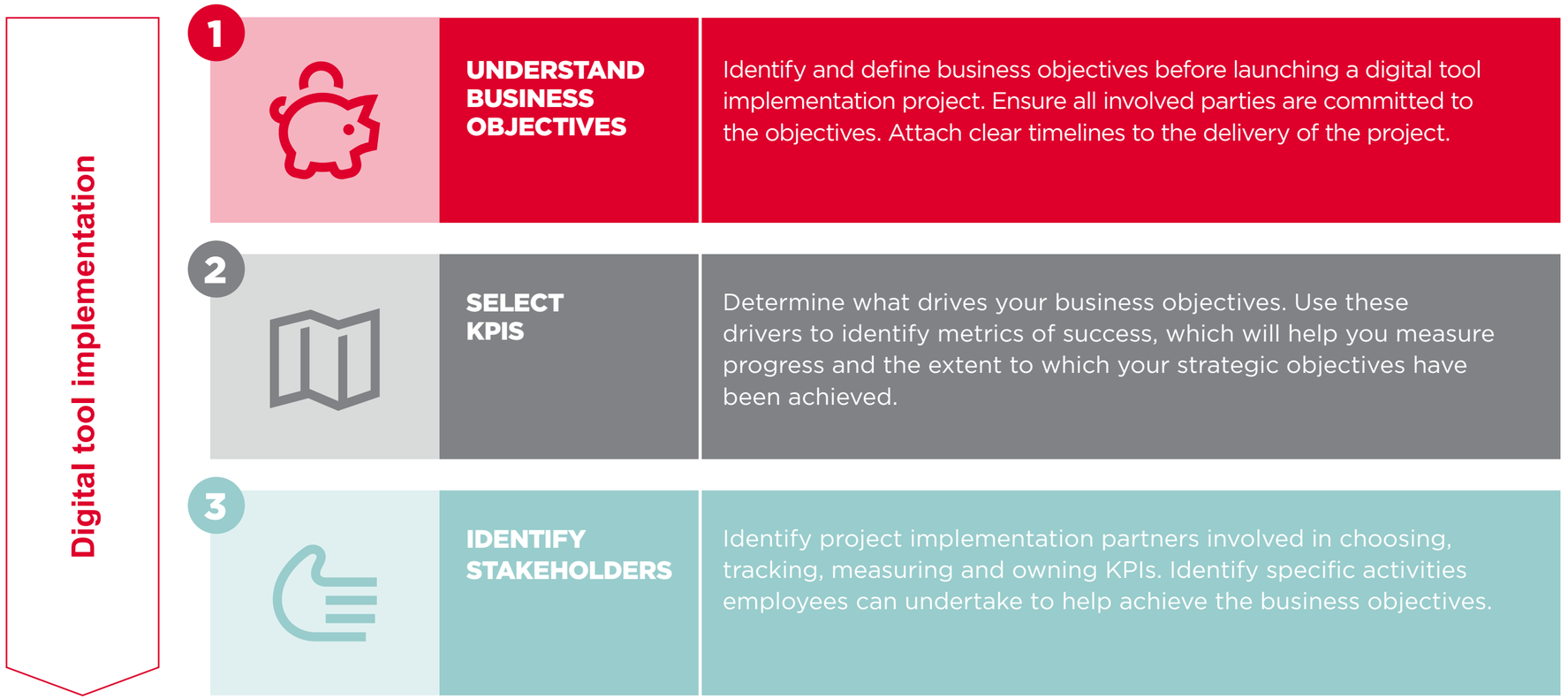
Digitising value chains improves operational efficiencies and business performance

Benefits

Figure 22 **Agribusiness benefits from last mile digitisation**

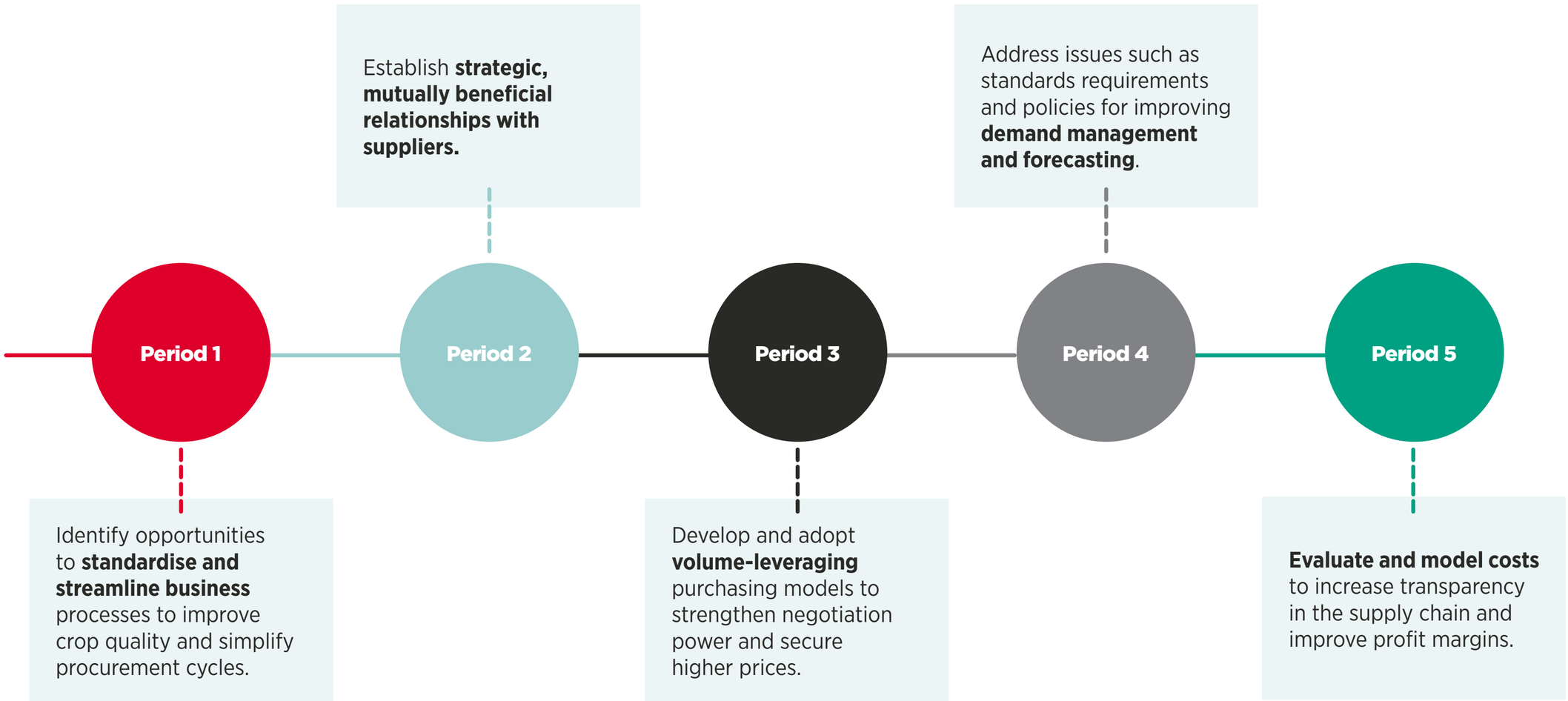
Relevant KPIs are needed to measure the success of any digital tool implementation project

Figure 23 **Digital tool implementation phases**



Examples of business objectives that drive digital agriculture projects, mapped against clear timelines

Business objectives



Examples of KPIs for measuring the success of digital projects in Ghana's cocoa value chain

KPIs

Agribusiness-farmer engagement

Last mile sourcing

Farmer recruitment	Capacity building	Programme management	Crop purchasing	Payment
Examples of KPIs				
• Number of steps and time needed to create/view individual farmer profiles, including training and transaction history • Percentage of farmers with expanded, rich media profiles • Number of farmers who requested/joined the company's agricultural input distribution programme in the last season	• Percentage of farmers who have benefited from extension services over the past month • Number of steps required to complete a farm development plan • Average time needed to track the progress of a farm development plan in a given month	• Grade given by the COCOBOD[18] for cocoa purchased by the agribusiness in the last season • Time and money spent on calls to alert farmers of upcoming certification audit • Time required to upload farmer training data, including modules, attendance and results, in the company's ERP system	• Time and money spent on calls to ask farmers if they have produce available • Average time needed by purchasing clerks to reach the weekly target set by the district manager • Average number of days between purchasing clerks' requests for evacuation[19] of crop and evacuation	• Amount of cash in circulation at HQ in a given month • Amount of cash lost/stolen • Average number of days between purchasing clerks requesting and receiving the money • Number of steps for the company to process farmer payments

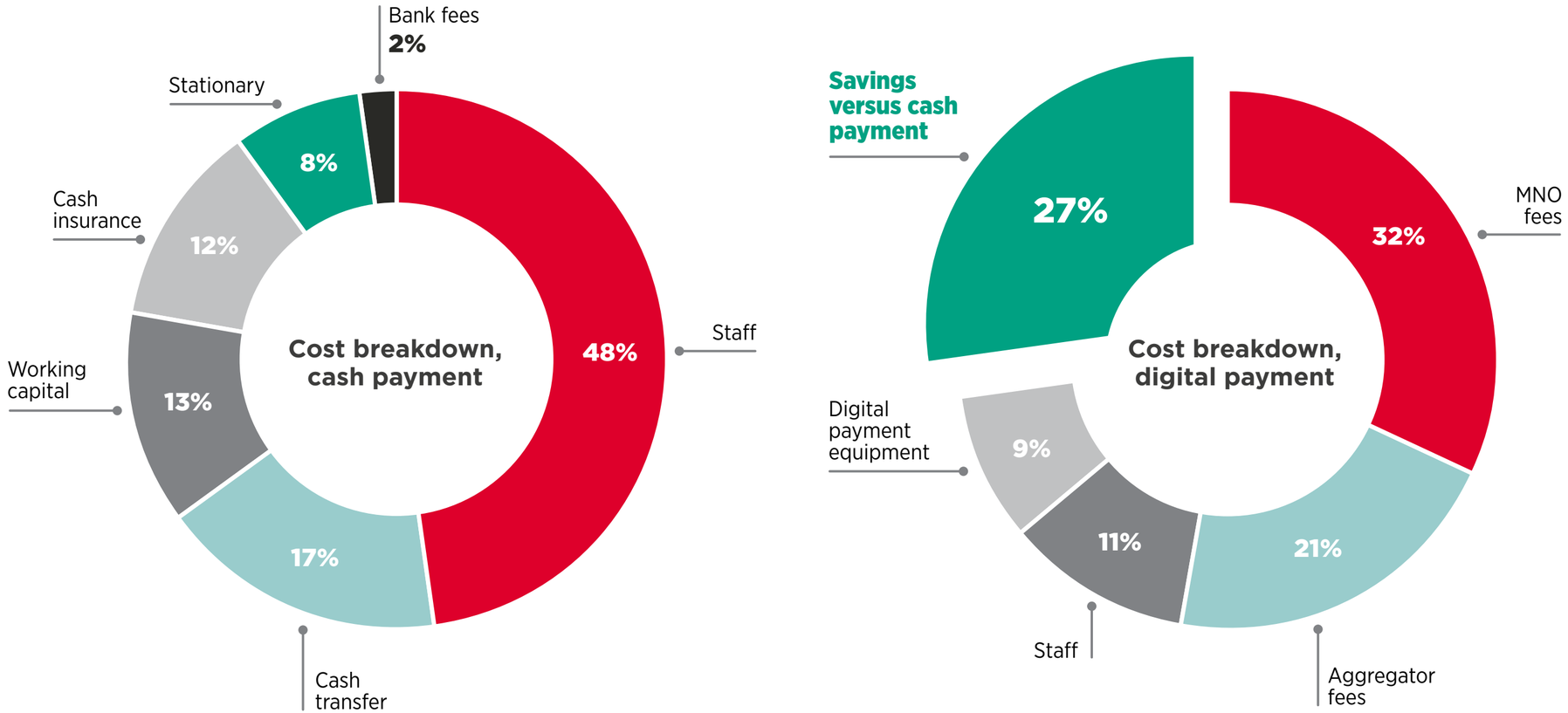
18. COCOBOD: Ghana's Cocoa Marketing Board
19. Evacuation: transfer of procured cocoa from purchasing clerk locations to a cocoa buyer's central warehouse

Case study #1: coffee buyer Kyagalanyi improves value proposition after shifting to digital payments

Case studies

Kyagalanyi Coffee Limited (KCL), a member of ED&F MAN Volcafe Coffee Division, conducted an agricultural payment digitisation pilot along the coffee value chain in Uganda. Farmers and traders[20] supplying coffee beans to KCL could opt to receive their payments in cash, mobile money or a combination of the two. A cost comparison of cash payments and digital payments revealed that **digital payments are 27 per cent less expensive than cash payments**.

Figure 24 **Cost breakdown, cash payment versus digital payment**



Source: CGAP (2017), Digitising bulk payments in agriculture: is mobile money cheaper than cash?

20. In addition to procuring directly from farmers, KCL also sources coffee beans from about 900 traders.

Case study #1: coffee buyer Kyagalanyi improves value proposition after shifting to digital payments

In addition to the direct cost savings Kyagalanyi saw from shifting to digital payments, the transition to digital payments also resulted in indirect benefits. Value Proposition Mapping revealed that **digital payments actually become 45 per cent less expensive than cash when its direct and indirect benefits are taken into account**.[21] Figure 25 below shows the breakdown of total cost reduction as a result of direct and indirect benefits.

Figure 25 **Direct and indirect benefits of digital payments (percentage of total cost reduction)**

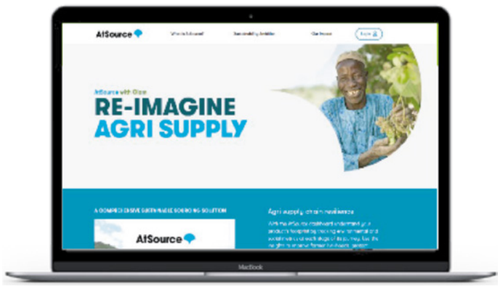
21. Sourced from: CGAP (2017), Digitising bulk payments in agriculture: is mobile money cheaper than cash?

Case study #2: Olam International embraces digital with a range of last mile tools

OLAM DIRECT[22]

- Digital Origination
- OFIS
- Olam Traceability
- Digital Warehouse
- Digital Procurement

OLAM INSIDE



- AtSource
- E-Commerce

OLAM FORWARD

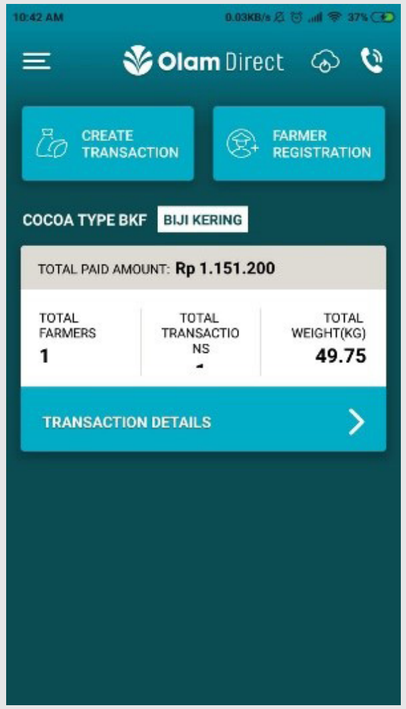
- Smart Factories
- Smart Farms
- E-trade Finance

22. Olam (2019), Re-imagining Olam: Offering tomorrow's products & services, Strategic Plan 2019–2024.

Case study #2: Olam Direct deploys Digital Origination suite of apps

Field Star app for farmer registration and training[23]

Farmer app for agriculture extension services



Micro collector app for crop micro-purchasing

Farmer lead app for crop aggregation

23. Sourced from: GSMA (2019), AgTech Innovation Unlocks Economic Identities for Smallholder Farmers in Indonesia.

Case study #3: Barry Callebaut uses Katchilè app for traceability in the cocoa supply chain

Case studies

Katchilè[24] is a cloud-based last mile digital tool for tracing cocoa beans and managing sustainability data. Using technology solutions from SAP, it combines desktop and mobile access and allows information on farmers, their farms and communities to be digitally recorded at every level of the supply chain.

Farmer registration, cocoa buying, processing and transportation records enable cocoa beans to be traced from the farmer to Barry Callebaut's warehouse. Sustainability-related activity records also help to assess and analyse the needs of individual farmers and communities, resulting in higher quality of beans and impact.

24. Sourced from: Barry Callebaut (2016), Barry Callebaut collaborates with SAP to offer an innovative app to boost sustainability data management.

Key findings and recommendations

- Agricultural organisations face pain points in processes and systems related to agribusiness-farmer engagement, farmer recruitment, programme management and farmer payment. These pain points affect a wide range of value chain activities, such as farm and farmer profiling, agricultural extension support and crop payment and receipt issuing.

- Holistic digital agriculture tools integrate multiple solutions and can help address multiple pain points at once. They give agricultural organisations greater control over their operations as they allow them to monitor them more closely, provide more transparent transactions and create effective communication channels, both internally and with smallholder suppliers.

- Agricultural organisations involved in a digital tool implementation project need to 1) define business objectives and attach clear timelines to the delivery of the project; 2) identify metrics of project success that can help measure progress and the extent to which strategic objectives have been achieved; and 3) identify project implementation partners and assign them specific activities to achieve the business objectives.

- Evidence shows that the transition to digital payments can have both direct and indirect benefits for agribusinesses. For a commodity buyer in the coffee value chain in Uganda, for example, a cost comparison of cash payments and digital payments revealed that digital payments were 27 per cent less expensive.

Prerequisites to digitising the agricultural last mile

March 2020

Introduction

What is the focus of this chapter?

This chapter explores the challenges facing mobile network operators (MNOs) and mobile money providers in rural areas, and the range of initiatives they can pursue to address the prerequisites to digitise agricultural value chains. It highlights why the participation of MNOs is crucial to unlocking the opportunity to digitise the agricultural last mile, namely, by enabling coverage and connectivity in rural areas. It also explains the role of mobile money providers in supporting functioning and liquid mobile money networks.

What is the structure of the chapter?

This chapter consists of three sections. With a focus on network connectivity, the first section makes the case for expanding rural networks. The second section examines the need to support liquid and functioning mobile money networks. The chapter concludes with a section on due diligence and the need to implement flexible yet rigorous practices.

Who is this chapter aimed at?

The chapter is aimed primarily at MNOs, which we argue are well positioned to develop holistic enterprise solutions for the agricultural vertical. However, this chapter will also be of interest to mobile money providers, agritech companies, donors and regulators, which must all work together to create enabling environments for the uptake of mobile money services in rural areas.

Key questions addressed in this chapter

Connectivity
Expanding coverage to rural areas

1 How can mobile operators support network expansion into rural areas and ensure adequate coverage for digitisation initiatives?

Liquidity
Supporting liquid and functioning mobile money networks

2 How can mobile money providers ensure agent networks are reliable and sufficiently liquid to support last mile payments?

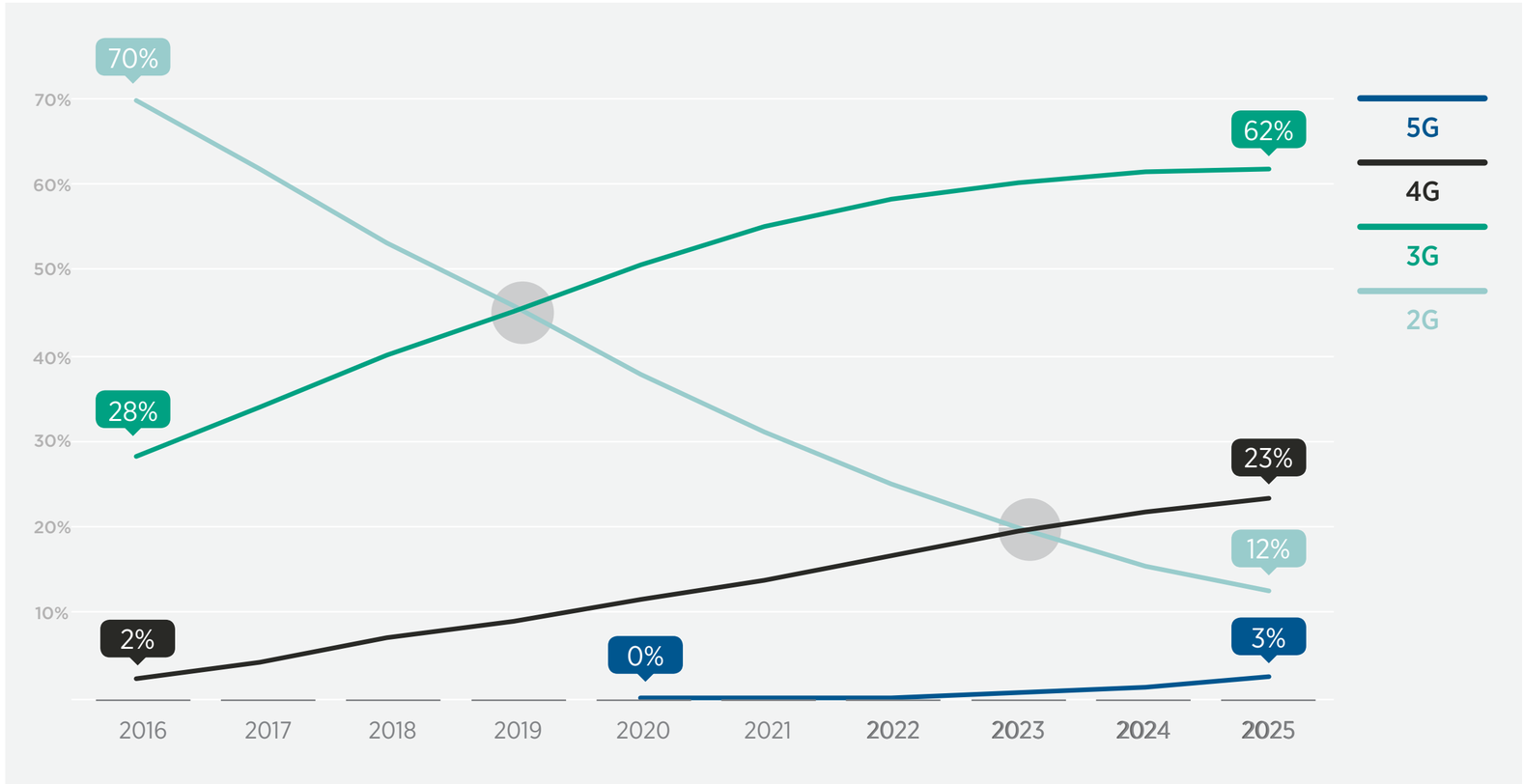
Due diligence
Implementing flexible yet rigorous practices

3 What due diligence principles and best practices should be applied to promote uptake of last mile payments?

Despite advances to 3G technology take-up, 2G accounts for the majority of connections in developing markets

Unlocking the opportunity to digitise agricultural value chains will require both 2G (SMS, STK, USSD and IVR) and 3G networks (software-based enterprise solutions and rich media services). However, only a small proportion of connections use 3G technology, almost entirely in urban areas. The vast majority of connections in rural areas still rely on 2G.[25]

Figure 26 **Percentage of connections (excluding licensed cellular IoT) by mobile technology type in Sub-Saharan Africa**



25. GSMA Intelligence (2019), The Mobile Economy Sub-Saharan Africa.

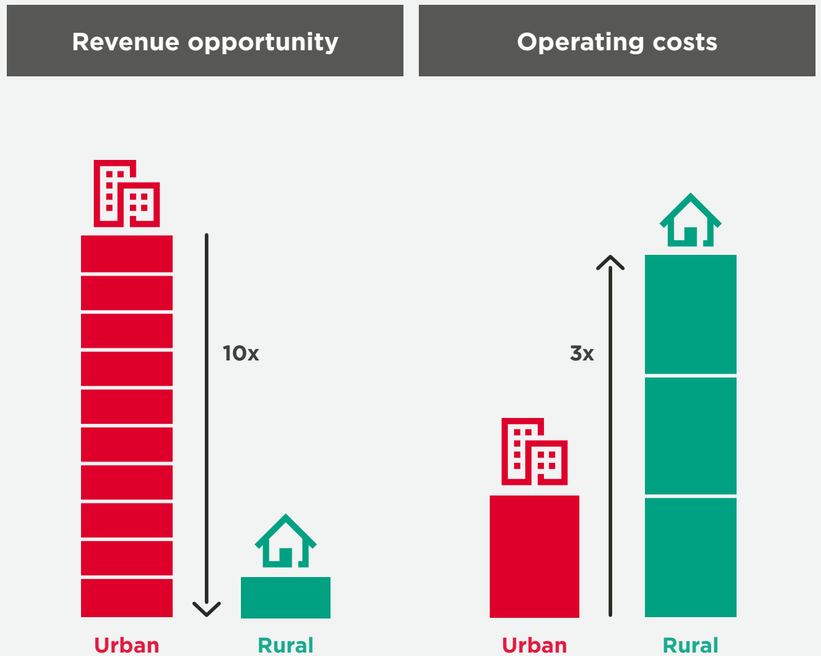
The business case for rural network expansion is challenging

Closing the coverage gap in remote areas is not a technical challenge but an economic one. The cost of deploying infrastructure can be up to three times higher than in urban areas, while revenue opportunities can be up to 10 times lower due to lower population density (often fewer than 100 people per square kilometre) and income levels (less potential revenue from each customer). This combination has a major influence on the business case for rural network expansion.[26]

A commercially sustainable rural network requires:

1. **Lowering** the capital expenditures (CapEx) and operating expenditures (OpEx) of cell sites and infrastructure, which will increase the return on investment (RoI) of extending coverage.
2. **Reducing** the risks of investing in mobile infrastructure (i.e. lowering the cost of capital).
3. **Enhancing** demand for mobile services in rural areas, which will unlock new revenue opportunities to make these new investments more profitable and attractive.

Figure 27 **Business case for rural versus urban base stations[27]**



26. GSMA Connected Society (2017), Unlocking rural coverage: Enablers for commercially sustainable mobile network expansion.
27. GSMA (2018), Enabling rural coverage: Regulatory and policy recommendations to foster mobile broadband coverage in developing countries.

Rural network expansion depends on innovation in the private and public sectors

Strategies and policies to improve the business case for rural network expansion

MOBILE OPERATORS

- Network sharing (passive and/or active models);
- Drawing on targeted government support (subsidies, universal service funds);
- Software-based networks; and
- Aerial (i.e. drones).

PUBLIC SECTOR

- Ensure cost-effective access to low-frequency spectrum;
- Support for spectrum refarming;
- Offer flexible licence conditions for service quality in rural and remote locations;
- Provide regulatory support for all forms of infrastructure sharing;
- Ensure non-discriminatory access to public infrastructure;
- Streamline planning approval processes;
- Eliminate sector-specific taxation on operators, vendors and consumers;
- Adopt a realistic position on competition policy, especially concerning market structure; and
- Support multi-sided business models, such as zero rating and sponsored data.

CASE STUDY

Progressive policies help MNOs extend rural network coverage in India

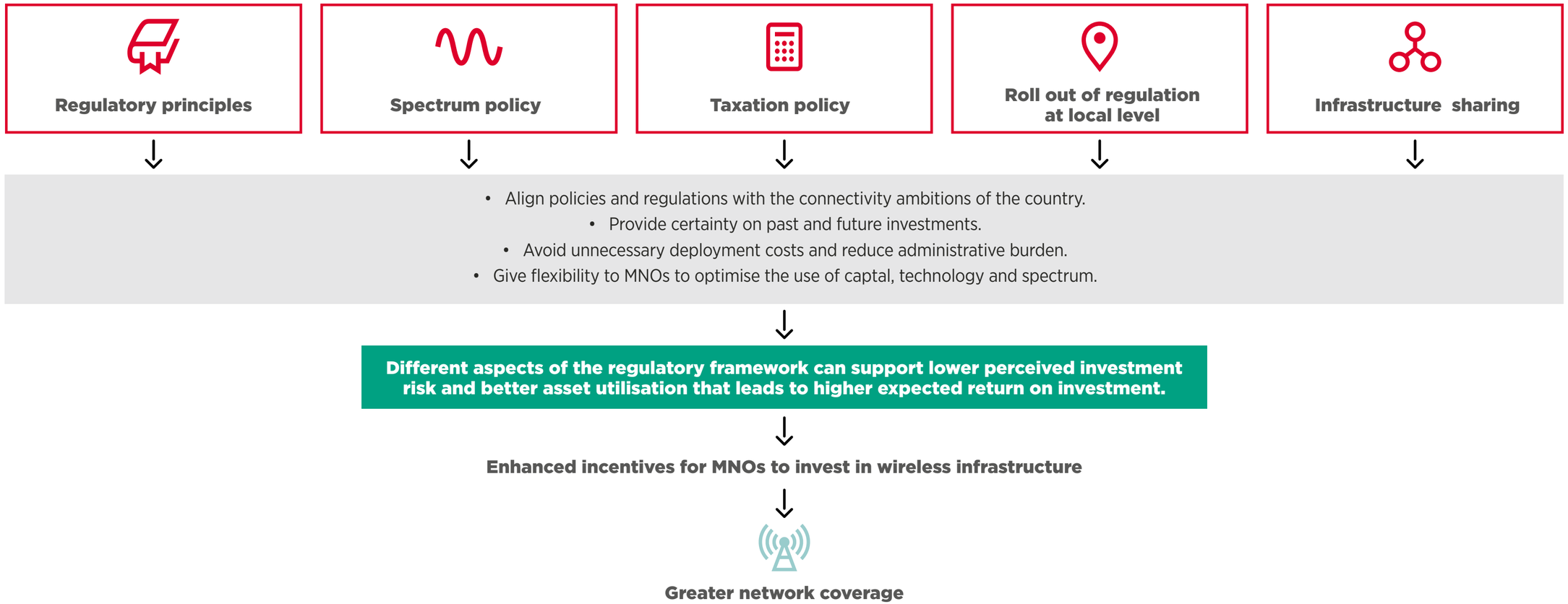
In 2007, there were about 100,000 base stations in India covering 40 per cent of the country's land area. This left an estimated half a billion people without mobile coverage.

Since then, the Telecom Regulatory Authority of India (TRAI) has modified licence agreements to allow MNOs to share both passive and active network infrastructure. The regulator also approved subsidies for tower deployment in rural areas using funds from the Universal Service Obligation Fund (USOF).

Tower sharing has stimulated investment and competition in India, with the overall base station count rising to 450,000 at the end of 2014, a 4.5-fold increase from 2007. As a result, 87 per cent of the population has 2G network coverage, with mobile services available to many communities for the first time.

Enabling regulatory frameworks support investment in rural areas

Figure 28 **Elements of a regulatory framework supporting investment in rural areas[28]**



28. GSMA (2018), Enabling rural coverage: Regulatory and policy recommendations to foster mobile broadband coverage in developing countries.

Rural network expansion offers opportunities beyond traditional revenue streams

MNOs should prioritise specific regions for network expansion based on an analysis of the entire revenue opportunity — not only voice, messaging and data, but also mobile financial services and the broader suite of enterprise solutions.

The agricultural vertical offers an opportunity for mobile money services and enterprise services, as demonstrated by the potential direct revenue opportunity from the digitisation of business-to-person (B2P) payments to farmers using mobile money. Digitising payments for large agribusinesses can provide the transaction volumes necessary to support rural network expansion.

To sustain this opportunity, MNOs must identify and prioritise network expansion in rural areas with greater potential to generate new revenue streams from the agricultural sector. To shed light on these growth opportunities, MNOs must invest in research at a regional or district level.

CASE STUDY

MTN Uganda makes rural base stations profitable by supporting an agricultural payments pilot[29]

Before it launched a pilot to digitise payments for a target market of 12,000 farmers in the coffee value chain, MTN Uganda strengthened its network coverage in the Mount Elgon region.

To reduce the initial investment risk in a new base station, which farmers needed to receive payments at the point of sale (coffee washing stations), the operator received a $100,000 loan from The Bill & Melinda Gates Foundation. After it was deployed, the base station became profitable within three months of the pilot launch.

29. GSMA AgriTech (2017), Opportunities in agricultural value chain digitisation: Learnings from Uganda.

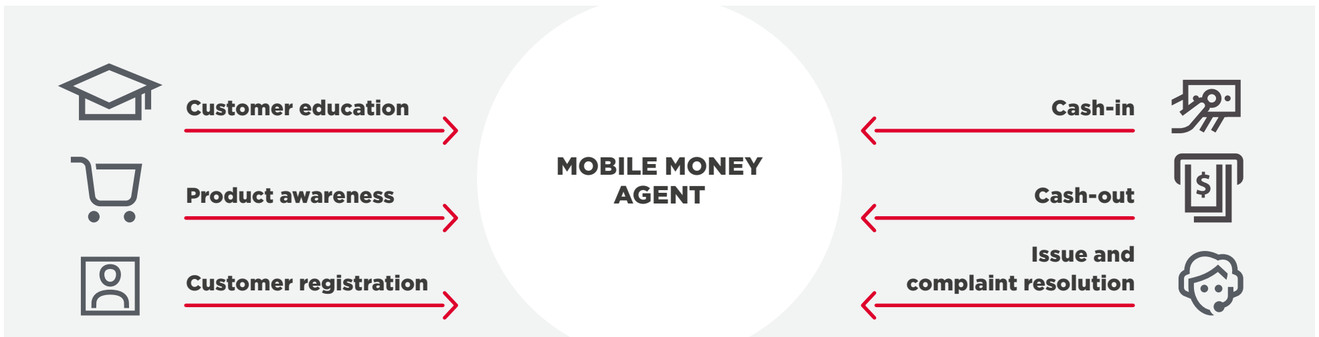
A reliable, liquid agent network is essential to support last mile agricultural payments

Liquidity

Successful initiatives to digitise last mile payments to farmers will depend on the proximity, availability, reliability and liquidity of mobile money agents in the proposed location.

Mobile money providers have invested heavily in expanding the reach of agent networks. In Kenya in 2017, there were over 170,000 registered mobile money agents who helped increase the penetration of formal financial services (banking and mobile money) in rural households.[30]

When transactions (e.g. value chain payments) are performed via third parties such as aggregators, it is crucial they have strategic partnerships with mobile money providers that manage the actual sales and distribution channel and are responsible for the provision of liquidity.



CASE STUDY

Yo Uganda builds its own sustainable cash-out agent network[31]

In Uganda, third parties (aggregators) have tried to directly support the disbursement of payments to farmers. Yo Uganda, for example, recruited 75 agents to perform cash-outs for coffee farmers participating in a value chain payment digitisation initiative with agribusiness Kyagalanyi. This has been challenging and costly for Yo Uganda, which had no previous knowledge of setting up agent networks. Managing cash liquidity has been the most challenging aspect since farmers chose to cash-out their payment immediately after receiving the funds.

30. GSMA (2017), State of the Industry Report on Mobile Money: Decade Edition 2006-2016.
31. GSMA (2017), Opportunities in agricultural value chain digitisation: Lessons from Uganda.

Agent liquidity is crucial, but challenging in rural areas

Due to the seasonality of agriculture, farmers in the same value chain in the same region will receive payments at the same time, putting pressure on agents to have large amounts of cash available at certain times of the year.

Early on, when a rural mobile money ecosystem is still maturing, spikes in demand for cash will exacerbate the liquidity burden for agents, as farmers will want to access some or all their income in cash at the same time. Insufficient float or cash will likely cause agents to turn clients away, who will then lose faith in the agent and potentially the entire mobile money service.

Given the challenges of ensuring liquidity in rural areas, success with rural and agricultural payments requires significant innovation and appetite for investment on the part of mobile money providers.

Figure 29 **Example of daily cash-out demands on an agent**

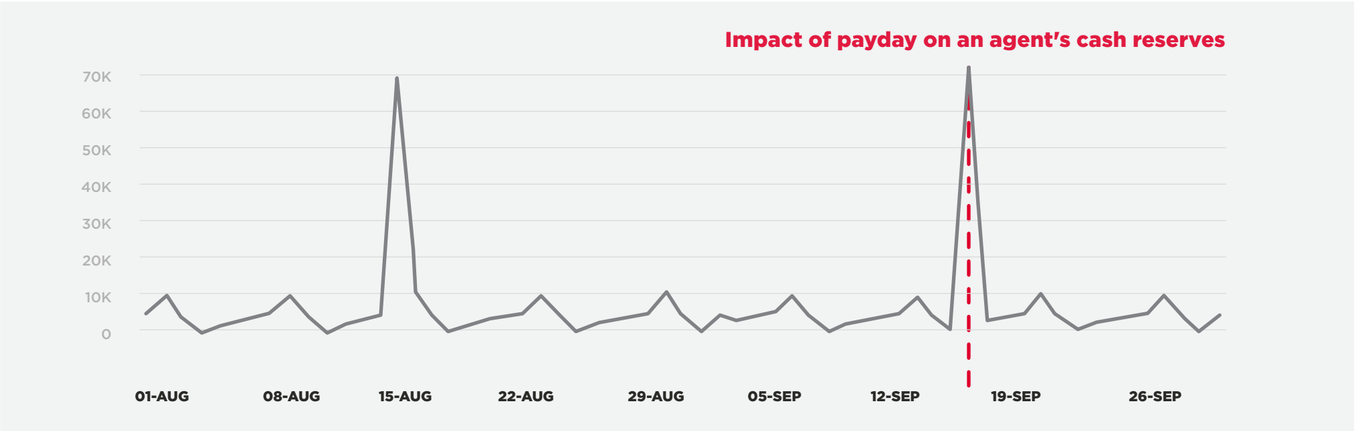
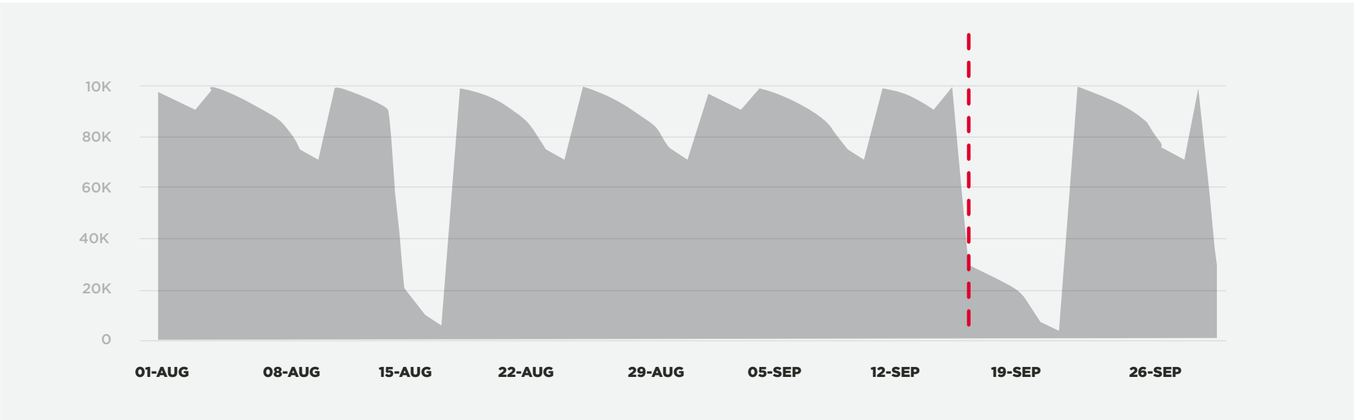


Figure 30 **Example of an agent's daily cash supply**



Initially, agent incentives will be needed to support cash-outs to farmers

Agents are paid commissions (tiered or percentage-based) for performing transactions (cash-in, cash-out and over-the-counter transactions) and registering new customers. In rural areas, the operational challenges of ensuring agents have capital, physical cash and float are heightened by the presence of, or proximity to, basic infrastructure, such as banking, electricity and transport.

To support the digitisation of last mile agricultural payments, mobile money providers will need to consider setting their commercial arrangements (commissions) to incentivise agents and support cash-outs. This will require:

1. Investing in e-money (float);
2. Rebalancing e-money and cash as necessary; and
3. Learning the processes for registering and educating new users, as well as serving existing customers.

Given the importance of agent commissions for the mobile money business model (see case study), it is unlikely that mobile money providers will be able to offer more generous commissions.

Key lessons from activating rural mobile agents:

1. Link commissions to quality parameters (e.g. customer loyalty and listening behaviour) to encourage agents to attract high-quality farmers.
2. Ensure agents understand the commission structure and benefits on offer, as well as the processes required to register new customers.[32]
3. Provide "soft" non-financial incentives, such as offering best performers the opportunity to move up the ladder and sell other products, or providing agents with gadgets (e.g. branded clothing, sun umbrellas) to give them a sense of pride and belonging in the service community.

CASE STUDY

The importance of agent commisions to the mobile money business

Agents are still the backbone of the mobile money industry, so the cost structure of mobile money providers continues to be driven by OpEx like agent commissions, marketing and personnel. In 2016, mobile money providers reported that, on average, 68 per cent of their costs were OpEx.[33]

32. In Malawi, agents are reluctant to offer new account registration because it is time consuming and claiming the commission requires significant paperwork that tends to get lost. The commission structure should therefore be clear and trusted by agents, otherwise they will not follow the process.
33. GSMA (2018), State of the Industry Report on Mobile Money 2017.

Master agents play a key role in selecting, training and incentivising rural agents

Master agents have proved essential to rapid distribution network expansion in remote regions, provided the right incentives are in place. Master agents buy float from the mobile money provider and then resell it to agents.

To encourage sales and transactions at the local level, master agents are typically paid a share of the percentage earned on agent commissions (generally an 80/20 split with 20 per cent retained by the master agent).[34]

Key tasks of master agents in rural areas[35]

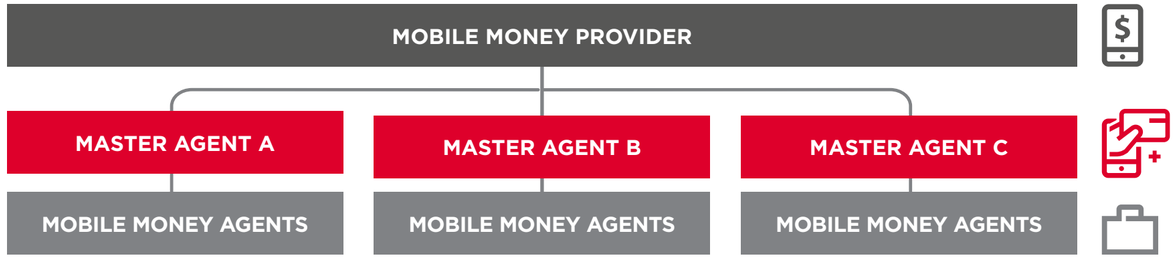
Agent selection: Should be able to recruit new agents and identify suitable new locations based on their prior knowledge of the region.

Agent onboarding: Should have an excellent understanding of the documentation required by the mobile money provider when recruiting new agents, and should be able to support new agents in gathering the correct documentation.

Liquidity management: Should be physically mobile, visiting their agents in person to supply them with liquidity (physical cash or e-money).

Monitoring and compliance: Research shows successful master agents have relationships with the majority of their agents before managing them.

Agent training: Should be able to provide assistance on queries about training, branding and technical issues.



CASE STUDY

MTN Zambia's early onboarding of master agents ensures rural agents are supported when making agricultural payments

When it is acquiring new agribusiness clients, MTN Zambia's mobile money unit provides details of the agreement to master agents in target rural areas, including the number of farmers who will be involved and the average value of payments. This way, master agents can see agribusiness recruitment as a business opportunity and commit to liquidity management. Typically, master agents are required to guarantee at least $400 in float per agent at the time agricultural payments are made.

34. GSMA (2015), Spotlight on rural supply: critical factors to create successful mobile money agents.
35. Information adapted from: http://www.helix-institute.com/blog/demystifying-role-master-agents

Expansion into rural areas requires rethinking agent profiles and selection criteria

Liquidity

Evidence from primary research in Chad and Mali suggests the need to rethink agent profiles in rural areas.[36] Industry best practice suggests that agents should be recruited based on the following five characteristics:

Agent selection criteria[37]	Ability to maintain cash and e-float balance	Strategic retail	Literate staff	Trusted by the community	Potential customer reach
Key condsiderations for agent selection in rural areas	• A master agent model becomes a crucial rebalancing mechanism in rural areas where traditional financial infrastructure is lacking. • Agent interoperability may be considered to reduce the liquidity burden in remote locations.	• Successful rural agents tend to have a broad product portfolio (selling SIMs and scratch cards as well as mobile money). • Successful rural agents tend to be well-established businesses rather than new kiosks. • Agents should have sufficient demand for transactions. Too many agents in one area with too little demand will cause some or all to leave the business.	• Customer awareness building and education are key activities of agents and require digital and financial literacy, often in multiple languages. • Having agents that are sufficiently literate is key to success. In rural areas, barriers to mobile money use are likely to be higher due to lower literacy rates and awareness of mobile money.	• Rural customers are more likely to return to the same agent repeatedly. • Rural customers are more likely to visit agents that already have established businesses, rather than new kiosks. • Rural agents must be trained to be farmer friendly because serving rural populations requires more time and patience.	• Successful rural agents perform transactions on behalf of more than one mobile money provider. This creates a better business case for the agent. • The mobile money provider should identify locations where demand for mobile money services will be high enough to create a sustainable business case for agents. • There should be a good ratio of agents to customer demand.

36. GSMA (2015), Spotlight on rural supply: critical factors to create successful mobile money agents.
37. Information adapted from: http://www.helix-institute.com/blog/demystifying-role-master-agents.

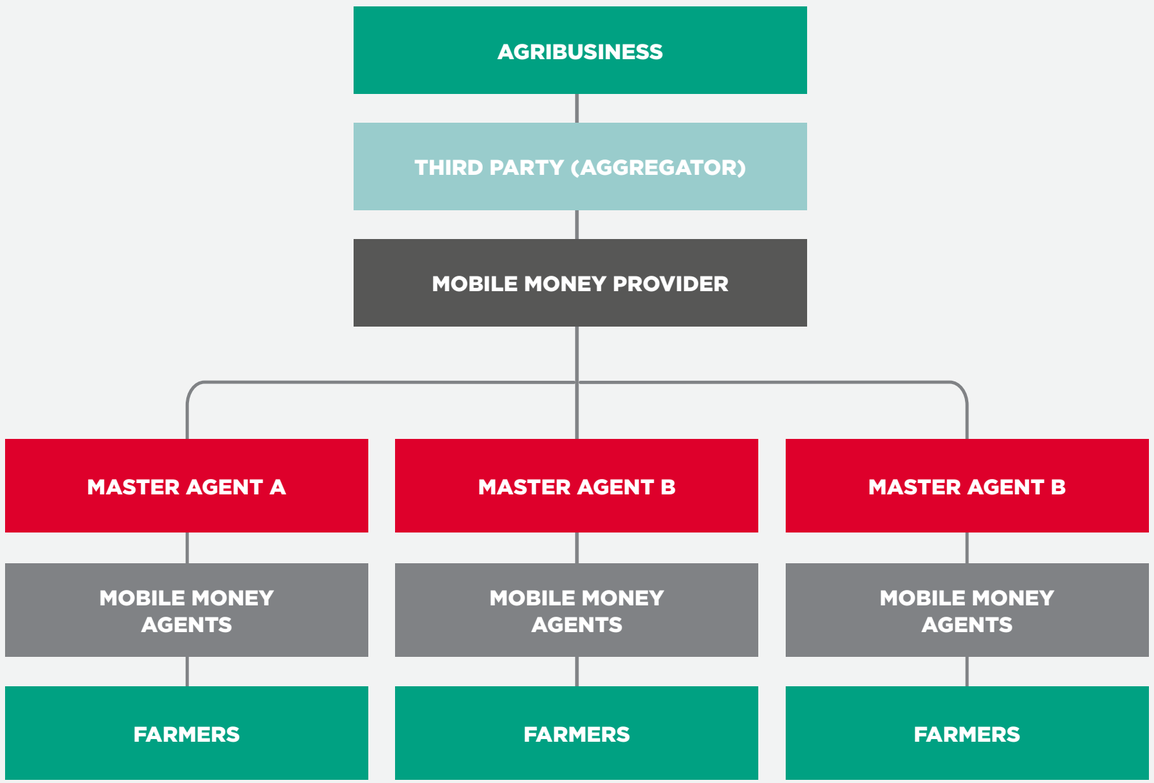
Effective communication is critical to digitising agricultural payments in the last mile

Liquidity

Clear lines of communication must be established between the agribusiness, aggregator (where relevant), mobile money provider, master agents and individual agents, so that all stakeholders understand when, who and how many farmers are going to be paid.

A breakdown in communication will likely lead to insufficient cash liquidity and force agents to turn farmers away, breeding distrust in the service.

SMS notifications or call centres can be used to ensure effective communication between mobile money providers, master agents and individual agents before, during and after last mile payments.



CASE STUDY

Consistent communication is key for MTN Ghana to maintain good customer service

In Ghana, when agribusiness Cargill makes a procurement payment to farmers via MTN's bulk payment platform, it promptly communicates its intention to MTN, which in turn contacts master agents. The master agents are incentivised to ensure individual agents have sufficient liquidity, even travelling to visit individual agents and rebalance their float. This official channel of communication, coupled with adequate incentives, are key to effective disbursement of bulk payments.

Flexible due diligence promotes rural uptake of mobile money services

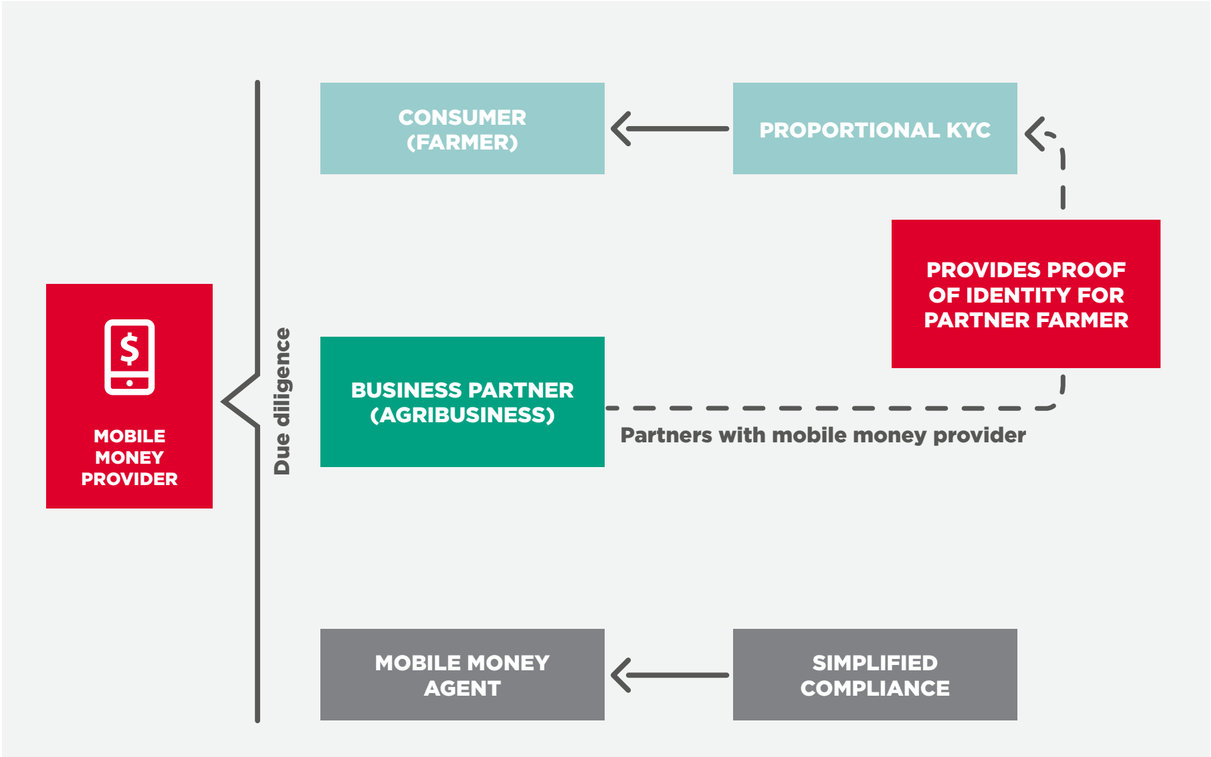
Conducting due diligence enables a financial services provider (e.g. mobile money provider) to evaluate relevant (past, present and future) aspects of potential customers and business partners, and protect itself from risk.[38]

Complex due diligence processes impede service uptake, especially since many rural customers (farmers) and agents are not likely to have the official documentation required to sign up for a mobile money account.

To enable uptake of mobile money services in rural areas, it is important to minimise due diligence requirements while also maintaining the integrity of the financial system. Proportional Know Your Customer (KYC) for farmers and simplified compliance for agents can help to overcome this systemic challenge.

Agribusinesses and cooperatives have an important role to play, not only because as formal entities they are more likely to be able to open a corporate account, but also because they can support service providers by providing proof of identity for the farmers they work with.

Figure 31 **Agribusiness role in farmer KYC**



38. GSMA (2014), Mobile Money: Enabling regulatory solutions.

Proportional KYC requirements can boost mobile money adoption among the rural poor

KYC requirements for opening a mobile money account can be challenging, especially for the rural poor, including farmers, who are most likely to lack the necessary ID.

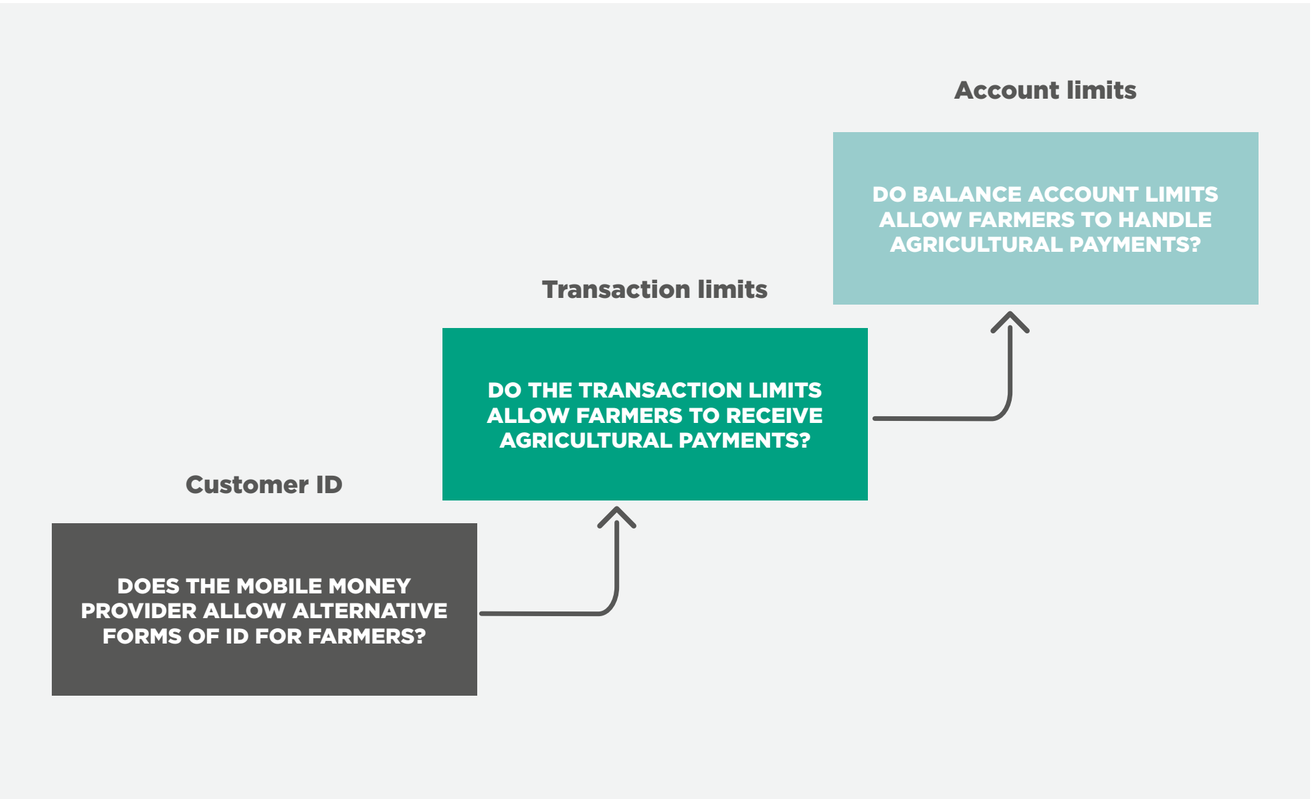
To address onerous due diligence requirements, regulators are increasingly applying the principle of proportionality: if a product is deemed to be low risk, simplified KYC permits easier customer identification and verification.

The principle of proportionality allows alternative forms of ID to be accepted (e.g. letter from employer) and sets ad hoc transaction limits on accounts where less formal or no ID is provided.

To support the digitisation of the last mile, proportional KYC must allow:

1. Alternative forms of customer identification for farmers;
2. Suitable (inbound) individual and daily transaction value limits to allow farmers to receive agricultural payments; and
3. Suitable maximum account balance limits to allow farmers to handle agricultural payments in their accounts.

Figure 32 **Value chain digitisation: building blocks of proportional KYC**



Agribusinesses and cooperatives can help provide proof of identity for farmers

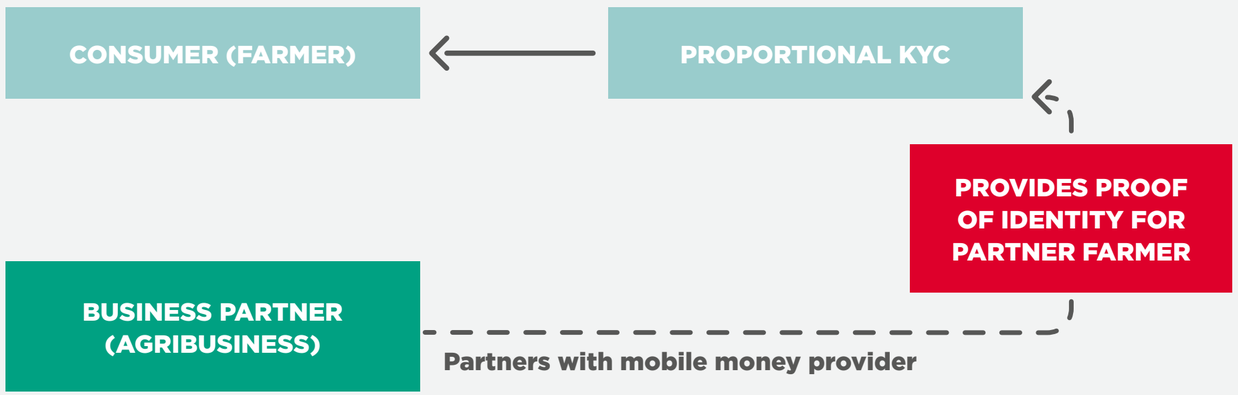
Due diligence

The introduction of alternative forms of customer identification can be challenging because even progressive financial regulators typically require mobile money providers to request some form of formal ID to access entry-level mobile money accounts.

Where national ID schemes are particularly weak, some financial services regulators have allowed providers to accept alternative forms of documentation to open mobile money accounts (e.g. India, Fiji, Somaliland).

When a prospective customer does not possess formal documentation, alternative forms of ID may include reference letters confirming the identity of the individual. Referees can be village elders, regional government/administration officials (e.g. social welfare office, healthcare centre) or employers.

As entities that pay farmers even when they are not directly employing them, agribusinesses and cooperatives can play an active role in ensuring farmers can open mobile money accounts. For example, by providing proof of ID as set out by the regulator, such as an employer ID and/or a reference letter.



Accounts must accommodate the size and frequency of value chain payments

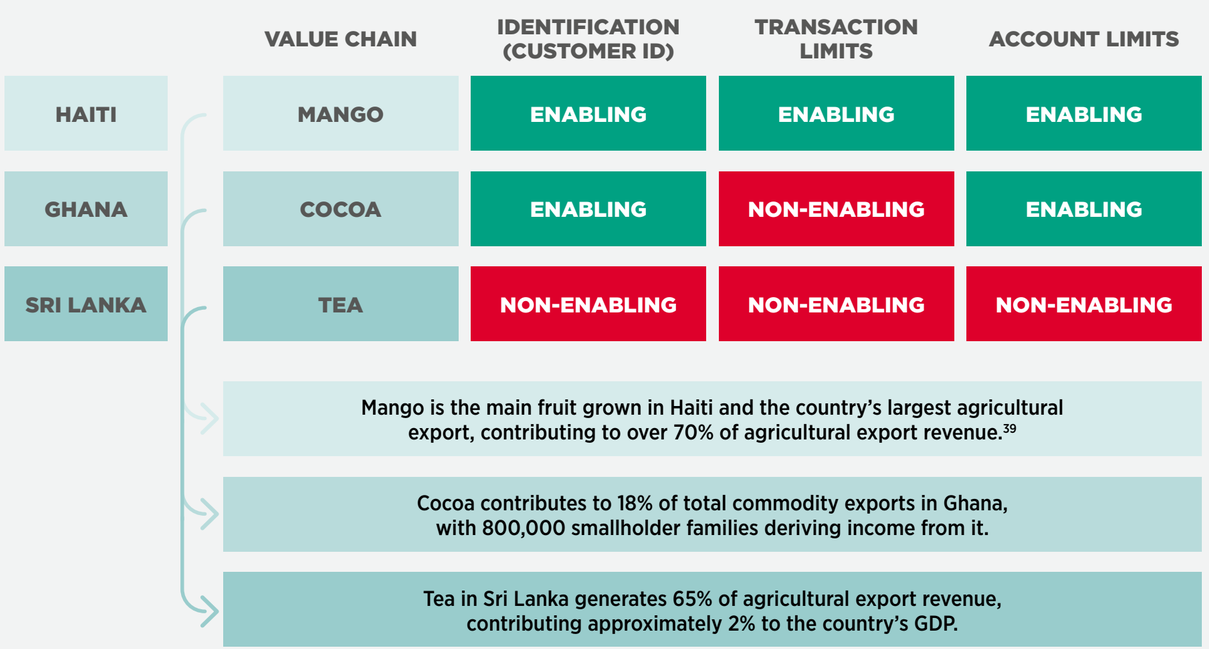
Mobile money providers must comply with the transaction value and account size limits mandated by financial sector regulators in their markets.

The average size and frequency of transactions vary widely depending on the value chain. Mobile money providers must therefore consider whether account sizes and transaction limits can handle payments in the targeted value chains.

To allow a full breadth of opportunities in the digitisation of agricultural payments, it is imperative that mobile money providers understand the unique nature of the agricultural sector.

In countries such as Haiti, Ghana and Sri Lanka, where mobile money providers are digitising last mile payments for the procurement of key cash crops, the transaction value and account size limits mandated by regulators have been challenging to implement.

Figure 33 **KYC requirements and implications for digitising last mile payments in selected countries**



39. See: https://knoema.com/jipyxgb/haiti-agriculture-trade-statistics

Case study #1: cash-out fees have been an obstacle to the digitisation of cocoa payments in Ghana

Due diligence

The Bank of Ghana permitted mobile money providers to issue a minimum KYC account (no proof of address required) with a balance limit of GHS 1,000 ($226) and an aggregate daily transaction limit of GHS 300 ($68). The Bank's mid-level KYC account, which corresponds with the maximum balance account offered by MTN's mobile money service MoMo, has a maximum balance limit of GHC 10,000 ($2,260) and an aggregate daily transaction limit of GHC 2,000 ($453).

During Ghana's main cocoa season (October to January), a cocoa farmer delivers an average of sixteen 64-kilo bags of cocoa beans ($108 per bag at 2017 prices) to buyers.[40] However, daily transaction limits on minimum KYC accounts have meant farmers must withdraw cash several times during the cocoa season and ensure that their next payment does not exceed their account balance limit. Withdrawal fees became the greatest barrier to mobile money adoption among farmers, with every transaction over GHS 50 incurring a one per cent fee.

MTN and agribusiness Cargill partnered to digitise cocoa procurement in Ghana. However, given the challenge of withdrawal fees, their initial focus was on digitising only premium payments for cocoa farmers registered in certification schemes (on average $5.50 per bag). Since 2017, MTN has partnered with several agribusinesses to digitise cocoa procurement in Ghana, including Royal Commodities.

MTN MOMO[41] (MID-LEVEL KYC ACCOUNT ALLOWED BY THE BANK OF GHANA)		IMPLICATIONS FOR COCOA VALUE CHAIN PAYMENTS	
Account balance limit	GHS 10,000 ($2,260)	👍	Account balance limits are unlikely to be an issue for farmers receiving mobile money payments.
Aggregate daily transaction limit	GHS 2,000 ($453)	👍	Farmers need to perform multiple cash-outs to retrieve their funds during the cocoa season and to ensure the next payment does not exceed their account limit.
Withdrawal fee per transaction	GHS 0.50 (FOR GHS 1-50) ($0.10)	👎	Farmers bear the cost of multiple withdrawals, increasing the burden of digital payments. Even the smallest possible payment incurs a one per cent withdrawal fee.
	1% OF TOTAL (FOR GHS 50 AND ABOVE)		

40. GSMA (2018), Opportunities in agricultural value chain digitisation: Learnings from Ghana.
41. MTN Ghana – MoMo: https://mtn.com.gh/insight/momo-tariffs/.

Case study #2: caps on mobile money have limited the opportunity to digitise Sri Lanka's tea sector

Due diligence

When Sri Lanka's central bank capped the size of mobile money accounts at LKR 25,000 ($160), agribusinesses were prevented from implementing digital payments in the tea value chain, by far the largest agricultural export in the country and widely produced by smallholder farmers.

Typically, a single agribusiness-to-farmer payment for tea crops in Sri Lanka ranged from LKR 25,000 to 50,000 ($160–$320). These payments, made on a monthly basis, significantly exceeded the maximum account size limits permissible in the market. The only option for an agribusiness was to send payments to farmers' accounts in multiple instalments.

Additionally, the maximum withdrawal allowance mandated by the financial regulator was LKR 5,000 ($32) per transaction. This has meant tea farmers must cash-out multiple times to retrieve their full funds and pay fees of LKR 100 ($0.60) per withdrawal — an additional cost and inconvenience.

MOBILE MONEY LIMITS AND FEES[42]		IMPLICATIONS FOR TEA VALUE CHAIN PAYMENTS
Maximum account size	**LKR 25,000 ($160)**	On average, a single tea value chain payment is twice the amount a mobile money account can hold.
Withdrawal transaction limit	**LKR 5,000 ($32)**	Farmers have to perform multiple cash-outs — an inconvenient process.
Withdrawal transaction fee	**LKR 100 ($0.60)**	Farmers bear the cost of multiple withdrawals, increasing the burden of digital payments.

42. Dialog Sri Lanka – EzCash: https://www.ezcash.lk/pricing.php

Simplified compliance requirements for agents support rural network expansion

Placing heavy compliance or financial constraints on potential agents will limit their ability to scale the distribution network in rural and underserved areas, where businesses are often less formal and less likely to have official business documentation.

Maintaining the integrity and financial sustainability of the agent network must therefore be balanced with proportionate due diligence.

PROSPECTIVE MOBILE MONEY AGENTS MUST GENERALLY:	STRATEGIES FOR SIMPLIFIED COMPLIANCE INCLUDE:
PROVIDE DOCUMENTATION • **Submit** formal documents (e.g. certificate of incorporation, VAT and tax certificates, company profile, business plan, copies of IDs of directors and key staff, business permits, proof of trading). • **Prove** they have sufficient working capital. • **Complete** an application form.	**Reducing the complexity of documents required** to sign up agents, ensuring proportionality. Mobile money providers should consider more flexible processes, for example, only asking prospective agents to provide business permits, proof of trading and evidence of sufficient working capital.
COMPLETE TRAINING • **Commit** to completing a training programme for agents to perform anti-money laundering (AML) and combating the financing of terrorism (CFT) checks on clients.	**Empowering** mobile money providers to conduct their own AML/CFT training so that agents can be trained in their own environments without having to travel to major urban centres.

Key findings and recommendations

- While there are still significant challenges in ensuring network coverage in rural areas, last mile digitisation initiatives can focus initially on regional clusters where there is demand from agribusiness clients in suitable value chains and adequate network coverage.

- When opportunities arise in regions without adequate network coverage, it is crucial that MNOs assess the business case for rural network expansion based on the full revenue opportunity of rural base stations, not only voice, messaging and data, but also mobile financial services and a broader suite of enterprise solutions.

- Early efforts by mobile money providers to digitise payments for last mile procurement have proved there is no secret formula to efficiently deploy mobile money agents in rural areas. Mobile money providers are unlikely to offer more favourable commissions to agents given the already pressing burdens of commissions on the mobile money business model.

- There is mounting evidence that efforts to activate rural agents should focus not on changing commission structures, but rather on a) ensuring agents understand the commission structure, the benefits on offer and the registration processes for new customers; and b) providing agents “soft” non-financial incentives, such as offering best performers the opportunity to move up the ladder and become a trusted community member.

Key findings and recommendations

- Rural agent selection and recruitment should be based on five key criteria: 1) the agent's ability to maintain cash and e-float balance; 2) identify strategic retail locations (established businesses); 3) basic and digital literacy for the agent to support their business and the needs of rural customers; 4) "farmer friendliness" and trust from the community; and 5) customer reach based on selecting locations where demand for mobile money services will be strong enough to support a sustainable business case.

- Master agents play a key role in identifying suitable rural agents and incentivising and training them. Early experience in digitising last mile procurement payments for farmers also shows that master agents play a critical role in ensuring liquidity for agricultural payments by maintaining an open line of communication between the mobile money provider, the aggregator (if involved) and individual agents. For mobile money providers, the deployment of master agents should focus on ensuring they are ready and liquid when the season for agricultural payments arrives.

- Proportional yet rigorous KYC is needed to digitise last mile procurement payments and, when formal IDs do not exist or are lacking, formal agricultural buyers like agribusinesses and cooperatives can play an important role in providing alternative proof of identity for the farmers they work with.

- Given the KYC challenge, the ability of mobile money accounts to handle agricultural payments (both the size of single transactions and overall account size) is the single biggest challenge to implementation. Given the significance of agricultural payments for rural economies, financial regulators must consider the needs of the agricultural sector and, if they are willing to take full advantage of mobile money for financial inclusion, they must adapt due diligence regulations to support these transactions.

The GSMA AgriTech Value Chain Assessment Tool (VCAT)

March 2020

4

Introduction

What is the focus of this chapter?

The GSMA Value Chain Assessment Tool (VCAT) is a framework for analysing value chains and supporting digital interventions in agriculture, particularly the digitisation of agricultural procurement payments. The focus of the tool is providing instructions, recommendations and examples to help analyse value chains for poverty reduction. The VCAT is primarily aimed at providers of digital financial services seeking to develop a better rural growth strategy, including mobile operators and other non-MNO mobile money providers. The tool would also be useful for agritech companies and other digital agriculture implementers working to digitise the last mile.

The GSMA VCAT provides a framework for:

Understanding the systemic factors and conditions under which value chains operate in the last mile; identifying value chains and use cases suitable for last mile digital interventions, especially digital payments; and building a pipeline of agricultural organisations operating in suitable value chains.

How to use the tool:

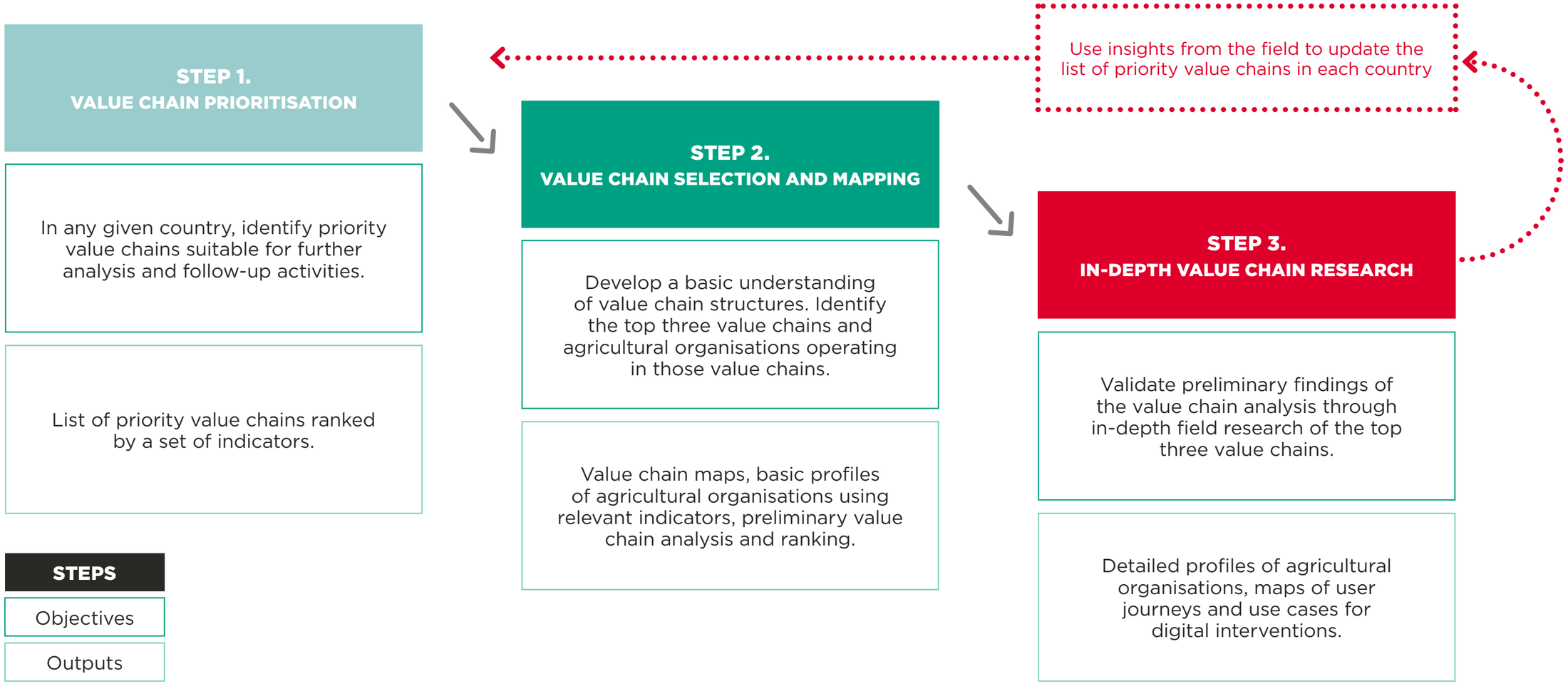
The VCAT employs a process used by the GSMA in engagement countries to advise mobile money providers on selecting suitable value chains and identifying agricultural organisation partners to digitise agricultural procurement payments. The step-by-step approach provides a structured way to analyse value chains and can be adjusted as necessary to align with your research objectives.

VCAT: three main activities guide the actions of mobile money providers

ACTIVITIES	**MAPPING THE VARIOUS DIMENSIONS OF THE FARMER/ BUYER RELATIONSHIP**		**UNDERSTANDING THE IMPACT OF THE MACRO-ENVIRONMENT**		**IDENTIFYING USE CASES FOR DIGITAL INTERVENTIONS, E.G. DIGITISATION OF PROCUREMENT PAYMENTS**	
EXAMPLE INSIGHTS	Transactional data between farmers and buyers gives insight into the seasonality and frequency of procurement payments.	Transactional data reveals the monetary value of single transactions and payment flows.	Crops remain unsold as buyers refuse to honour government-set farmgate prices.	Regulatory and legal framework promotes a cooperative model for linking farmers to market.	Mobile money emerges as an alternative to cash procurement payments to farmers.	Mobile tools complement face-to-face delivery of agricultural extension.
MOBILE MONEY PROVIDER ACTIONS	Ensure that mobile money agents have sufficient liquidity to enable cash withdrawals at the time of procurement payments.	Assess whether mobile money account size and transaction limits can handle value chain payments.	Delay development of last mile digital tool or shift to alternative value chain.	Consider providing additional resources for digital literacy training for cooperatives.	Ensure mobile money agent network is reliable and sufficiently liquid to support digitisation of payments.[43]	Evaluate the suitability of SMS for buyers to disseminate agricultural information to farmers.

43. GSMA AgriTech (2018), Prerequisites to digitising the agricultural last mile.

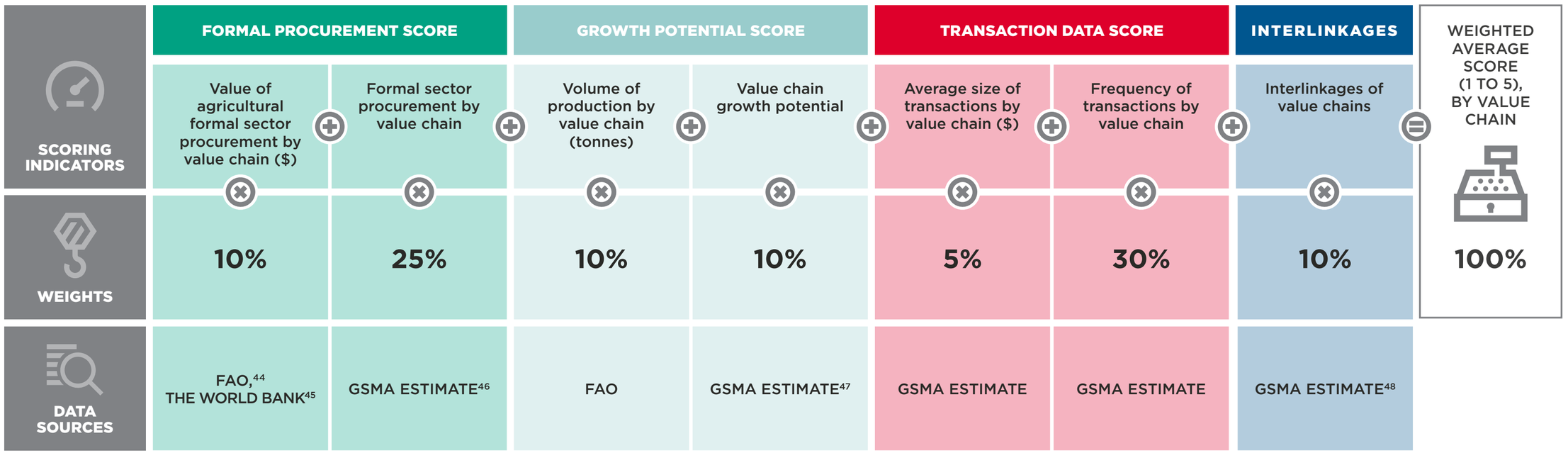
The VCAT is a step-by-step guide to understanding agricultural value chains



Value chain prioritisation begins with aggregating and analysing value chain data

STEP 1. Value chain prioritisation

The GSMA has developed a model for identifying priority value chains for agricultural payment digitisation. The model calculates the weighted average score (1 to 5) of a value chain against seven indicators, by country. The data for these indicators comes from well-known sources, such as the FAO and The World Bank, or from estimates provided by the GSMA.



44. Local production quantity (by country), FAOSTAT. Available at: http://www.fao.org/faostat/en/#data
45. Local value of procurement (by country), The World Bank. Available at: https://data.worldbank.org/indicator
46. Weighted average of three global sub-indicators for each value chain estimated by GSMA: share of exports, commercial activity and level of formality in the value chain. This score does not change between countries.
47. Growth of historic volume and value of total agricultural output in the value chain, by country.
48. Level of intersection with other value chains, which is defined by the probability that a farmer cultivates one or more crops. This score does not change between countries.

Formal value chains with high growth potential and transaction frequency are best suited to digital payments

STEP 1. Value chain prioritisation

	FORMAL PROCUREMENT SCORE		GROWTH POTENTIAL SCORE		TRANSACTION DATA SCORE		INTERLINKAGES	WEIGHTED AVERAGE SCORE (1 TO 5), BY VALUE CHAIN
SCORING INDICATORS	Value of agricultural formal sector procurement by value chain ($)	Formal sector procurement by value chain	Volume of production by value chain (tonnes)	Value chain growth potential	Average size of transactions by value chain ($)	Frequency of transactions by value chain	Interlinkages of value chains	
WEIGHTS	10%	25%	10%	10%	5%	30%	10%	100%
HOW IS THIS RELEVANT?	Formal value chains with established structures and well-defined roles and economic relationships are more likely to offer mobile money providers opportunities to digitise procurement payments, which can be a pathway to financial inclusion for farmers.		Value chains with higher growth potential are more likely to support mobile money-enabled business-to-person (B2P) digital payments that are sustainable over the long term and help larger farmer groups scale and become more resilient.[49]		Mobile money services are best suited to small ticket transactions due to the transaction and wallet size limits for customers and the liquidity challenges of agents. Large payments may require farmers to upgrade their mobile money account through an often complex customer due diligence process.		Value chains that score high in interlinkages with other value chains are more likely to offer opportunities for services to scale.	

49. GSMA AgriTech and GSMA Intelligence (2016), Market size and opportunity in digitising payments in agricultural value chains.

Output example: oil crops and cocoa top list of priority value chains for payment digitisation in Ghana

STEP 1. Value chain prioritisation

SCORING INDICATORS	FORMAL PROCUREMENT SCORE		GROWTH POTENTIAL SCORE		TRANSACTION DATA SCORE		INTERLINKAGES	FINAL SCORE (WEIGHTED AVERAGE)[50]
	Value of agricultural formal sector procurement by value chain ($)	Formal sector procurement by value chain	Volume of production by value chain (tonnes)	Value chain growth potential	Average size of transactions by value chain ($)	Frequency of transactions by value chain	Interlinkages of value chains	
WEIGHTS	10%	25%	10%	10%	5%	30%	10%	100%
OIL CROPS	4	4	5	5	4	4	3	4.2
COCOA	5	5	4	4	2	3	4	3.9
TROPICAL FRUITS	4	4	4	4	4	4	3	3.8
NUTS	4	4	4	4	4	4	2	3.7
PALM OIL	2	3	3	3	4	5	4	3.7
RUBBER	3	4	2	2	4	4	4	3.6
EGGS	3	2	2	3	5	5	4	3.5
SPICES	4	5	3	3	2	3	3	3.5
MILK	2	2	2	2	5	5	5	3.5
ROOTS AND TUBERS	5	3	5	5	4	3	2	3.5

50. All scores range between 1 and 5. The higher the score, the more suited the value chain is to digitising agricultural procurement payments.

Value chain selection improves stakeholders' understanding of agricultural procurement

STEP 2. Value chain selection and mapping

Value chain selection focuses on the list of priority value chains identified in the first step. If you are a mobile money provider, select value chains from this list based on their suitability for digital payments and create basic profiles of agricultural organisations that include insights from semi-structured interviews with stakeholders in these organisations. In these profiles, include key procurement data and information on activities in the last mile that help you understand the potential to digitise particular value chains.

To evaluate this potential:

- Assess mobile network coverage in areas where farmers are located.
- Evaluate the suitability of transaction value limits and account balance limits to allow farmers to receive agricultural payments.
- Estimate the proximity, availability, reliability and liquidity of mobile money agents in areas where farmers are located.
- Determine whether current Know Your Customer (KYC) requirements will enable digital payments in that value chain.

Value chain mapping makes value chain structures and activities more visible

Use value chain mapping to develop a basic understanding of value chain structures and create maps of the most suitable value chains.

In your value chain maps, include:

- Actors participating in value addition with a focus on those interacting with smallholder farmers (e.g. agribusinesses, cooperatives, intermediaries).
- Core processes in a value chain and the interactions between the main actors involved in these processes (e.g. collection, processing, certification).
- Product, information and money flows in the value chain (e.g. agricultural extension services, procurement payments, certification premium payments).
- Crop sourcing by procurement channel (e.g. direct procurement, via intermediaries own plantations).
- Total addressable market in the country (i.e. total number of farmers engaged in the value chain nationwide).

Create profiles of agricultural organisations engaged in direct crop procurement

CRITERIA FOR SELECTING AGRICULTURAL ORGANISATIONS

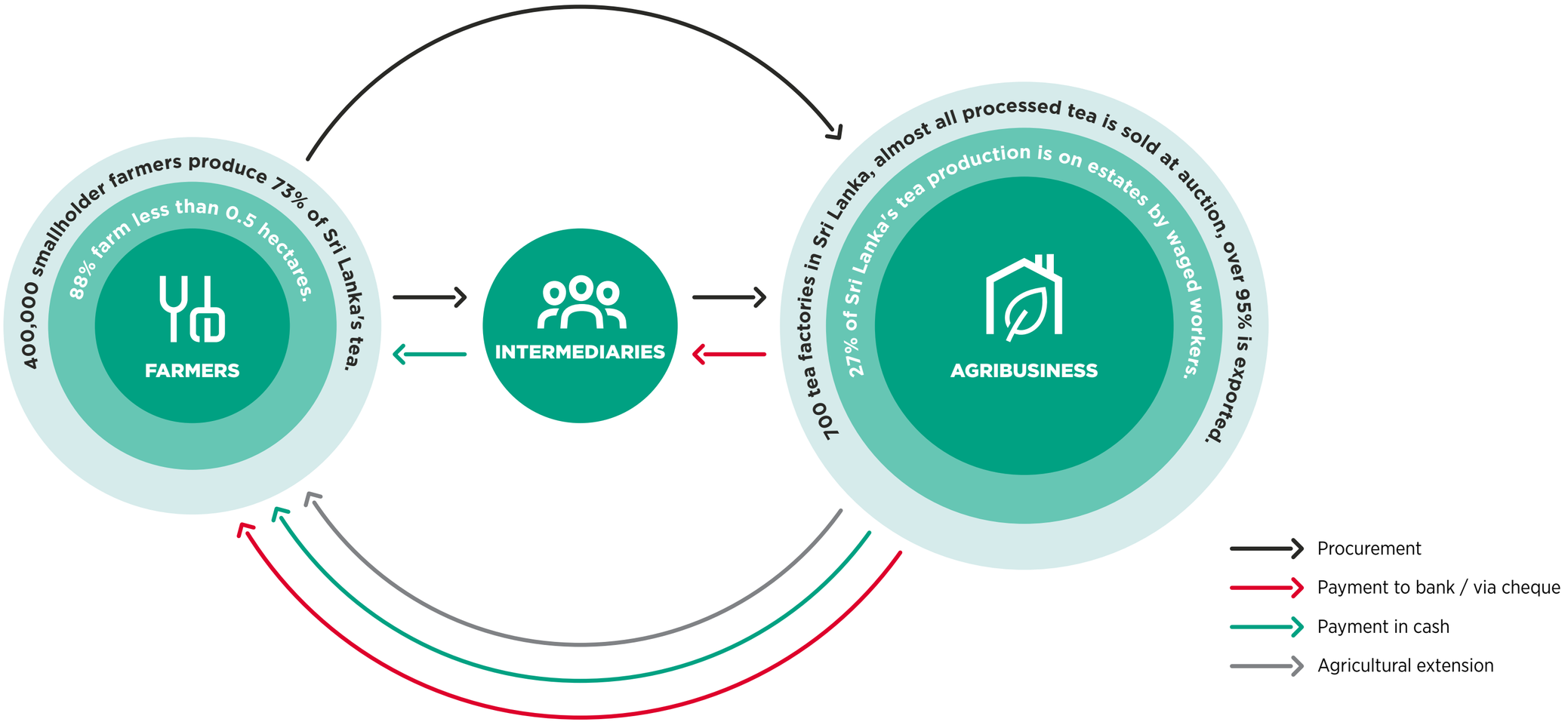
DIRECT PROCUREMENT	Loose and fragmented informal value chains that rely on intermediaries make it challenging for mobile money providers to digitise procurement payments and promote financial inclusion for farmers. Create profiles and seek partnerships with agricultural organisations involved in direct procurement and operating in more formal value chains that show a higher degree of crop aggregation in bulking groups (in a cooperative-based model) and at the field clerk level (in vertically integrated agribusinesses).
LARGE SUPPLIER BASE	In any digitisation initiative, mobile money providers may have to commit significant capital expenditures (CapEx) and operating expenditures (OpEx) to improve their mobile network infrastructure and maintain the liquidity of their rural agent network. Focus on agricultural organisations that procure from a significant number of farmers (typically several hundred or more) as they are likely to offer the highest direct revenue opportunity for mobile money providers and economies of scale.
HIGH TRANSACTION FREQUENCY	As farmers are likely to cash out their payments immediately, managing cash liquidity often becomes the biggest challenge for mobile money providers in last mile digitisation initiatives. Focusing on agricultural organisations operating in value chains with high transaction frequency across a longer harvest season allows mobile money providers to ensure liquidity in rural areas and reduces the need for repeated digital literacy training between payments. Small numbers of large payments are likely to put a strain on the agent network at the peak of the harvest season and cause spikes in demand for cash.

Output example: template for profiling agricultural organisation and its procurement activities

ORGANISATION DETAILS	Organisation name	Organisation type	Contact details
VALUE CHAIN DETAILS	Primary value chain	Location and number of farmers in direct procurement	Crop seasonality
PROCUREMENT ACTIVITIES	Number of direct payments to individual farmers	Single transaction value	Current payment method
KEY VALUE CHAIN ACTIVITIES	Details of contract farming	Description of farmer profiling process	Participation in certification or export schemes

Output example: map of Sri Lanka's tea value chain shows total addressable market for last mile digital tool

STEP 2. Value chain selection and mapping



In-depth value chain research can identify suitable use cases for digitisation

STEP 3. In-depth value chain research

In-depth calue chain research focuses on the agricultural organisations and value chains selected in Step 2. It allows digital agriculture implementers to assess the barriers to improved procurement performance and the competitiveness of farmers and buyers, as well as the potential role of mobile money and agritech companies in addressing some of these limitations.

As part of your in-depth research, use semi-structured interviews with key stakeholders in the value chain, including farmers, office staff of agricultural organisations, buying agents and extension officers, among others, to generate the following outputs:

- ☑ Detailed profiles of selected agricultural organisations based on insights from a range of topics, such as digital literacy rates, integration of smallholder farmers in the supply chain and farmer training tools.
- ☑ Description of key activities with an emphasis on those involving farmers and buyers, such as crop collection, receipt issuing and farmer payments.
- ☑ Mapping of key pain points for farmers and agricultural organisations against these activities.
- ☑ Assessment of agricultural organisations' readiness to adopt last mile digital tools.
- ☑ Identification of mobile use cases for digital interventions, for example, digitising last mile payments.

Digital tools can address inefficiencies in many last mile systems and processes

STEP 3. In-depth value chain research

Field observations and semi-structured interviews with stakeholders in the value chain empower digital agriculture implementers to understand the full range of activities occurring in the last mile, and identify inefficiencies affecting systems and processes involved in value addition. Expand the scope of your research beyond agricultural payments using the diagram below.

Inefficiencies often result from opportunity costs, which are the costs of employing production resources in a particular way rather than pursuing alternative business options. For example, assigning a realistic estimated value to the time it takes farmers and agribusiness staff to process cash payments for crop procurement allows project stakeholders to make the case to switch from cash to mobile money. If these costs are not assigned, value chain research will unintentionally treat these as free resources.

VALUE CHAIN STAGES	FARMER RECRUITMENT	CAPACITY BUILDING	COMMUNICATION	PROGRAMME MANAGEMENT	CROP PURCHASING	FINANCING
VALUE CHAIN ACTIVITIES	• Farmer sensitisation • Farm and farmer profiling • Input provision • Crop planting • Crop husbandry	• Agricultural extension support • Staff training	• Last mile communication	• Crop certification • Crop tracibility • Sustainibility programme	• Crop harvest • Crop transportation • Crop collection • Receipt issuing • Quality control	• Farmer payments • Payment reconciliation • Advances and loans • Fraud prevention

Output example: a map of activities and pain points in the tea farmer journey unlocks opportunities for digitisation beyond mobile money

STEP 3. In-depth value chain research

	HARVEST	CROP HANDOVER	QUALITY CONTROL AT FACTORY	PAYMENTS
Activity description	Farmer stores plucked green tea leaf in 22-kilo natural fibre sacks.	Farmer hands over leaves to collector at field edge.	Farmer's harvest is weighed using digital scales and deductions are made based on moisture, leaf quality and weight of sacks.	Farmer receives advances and balance payments based on recent supply history.
Pain points	Unpredictable weather patterns affect harvest and yield.	Farmer unaware of collection time (farmer must be physically present all afternoon while truck is collecting from farmers).	Farmer does not know how much is being deducted at factory; only discovers upon receipt of remittance advice. Latest green leaf price only known via word of mouth/if farmer visits the factory.	Farmer is required to travel to the factory to receive cash advances or to a bank to cash out. Individual factory policies limit how much they are prepared to pay in cash. Farmer potentially carries a large amount of cash (cash-handling risks).
Opportunity areas	Weather forecast tool.	Collection schedule shared with farmers.	Instant push notifications to farmers.	Mobile money solution as the entry point to last mile digitisation.

Key findings and recommendations

- The GSMA's model scores value chains against key indicators affecting the digitisation of agricultural procurement payments and ranks them in order of priority.
- The potential to digitise agricultural procurement payments is greater in formal value chains experiencing high transaction frequency and transaction values that are compatible with mobile money transaction and wallet size limits.
- Creating profiles of agricultural organisations based on key procurement indicators and last mile activities give mobile money providers a basic understanding of value chain structures and allows them to assess the suitability of particular value chains for digital payments.
- To maximise benefits for farmers, mobile money providers should profile and seek partnership opportunities with agricultural organisations involved in direct procurement from a significant number of farmers.
- In-depth field research helps to create detailed agricultural organisation profiles, map user journeys and identify use cases for digital interventions that extend beyond digital payments.
- Field observations and semi-structured interviews with value chain stakeholders help digital agriculture implementers to recognise inefficiencies in agricultural value chains that can be addressed with holistic digital solutions.

Digital footprints and economic identities for farmers

March 2020

Problem statement, key questions and audience

With a rising global population (8.5 billion by 2030), a huge increase in smallholder financing is needed to meet the global demand for food. However, the total credit provided to smallholder farmers by informal and formal financial institutions, as well as value chain actors, only meets about 30 per cent ($68 billion) of the estimated need. Specifically, farmers lack access to long-term capital for asset financing and crop improvements essential for growing higher quality crops, increasing productivity and becoming resilient to climate change. In Sub-Saharan Africa, only one per cent of the need for long-term capital is met by informal and formal lenders.

Farmers struggle to access financial services because they lack important data, in digital or paper form, to prove their creditworthiness to financial services providers (FSPs). The emergence of mobile-based digital agriculture tools that generate digital footprints for farms and farmers offers huge potential to bridge the data gap in smallholder financing. Digital tools that enable farmers to access markets, such as digital procurement solutions and e-commerce services, are especially useful for generating rich data sets, such as transactional data from the sale of crops. For commercial farmers, these tools can open a pathway to financial inclusion.

To unlock the opportunity to build economic identities for farmers and advance financial inclusion, effective data-sharing partnerships must be created between those that have the data: agribusinesses, agritechs and MNOs. These actors also have a shared interest in enabling financial services for farmers. This chapter focuses on the supply side to highlight how valuable farmer and farm data are generated, as well as emerging models for data-sharing partnerships. The chapter also looks at the demand side, including the financial needs of farmers and key considerations for product design.

This chapter is aimed at value chain actors, agritechs, MNOs and FSPs keen to build data-sharing partnerships that support financial inclusion for farmers. It also aims to support the decision making of social impact and agritech investors.

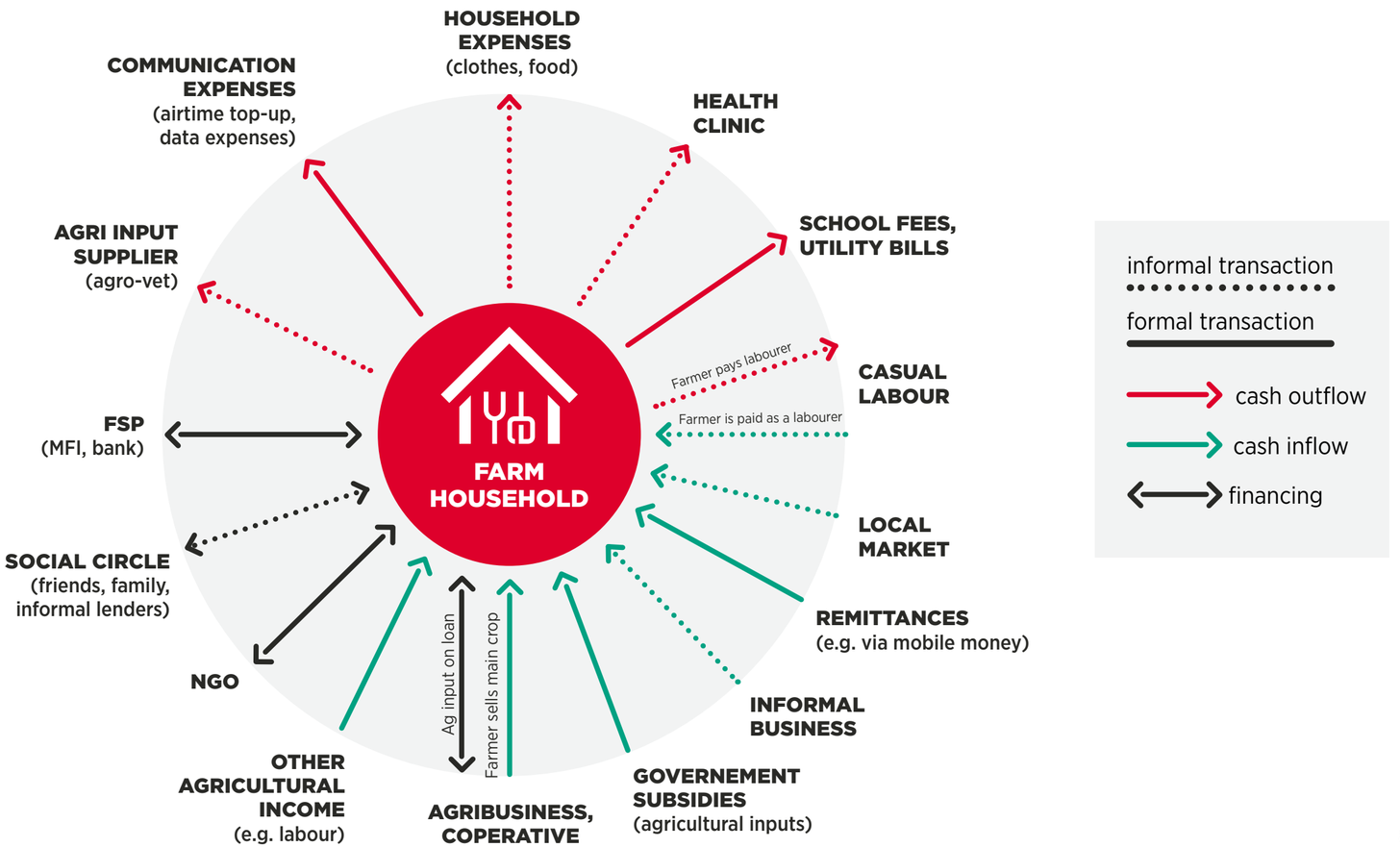
Access to finance remains largely informal for three main segments of smallholder farmers in the developing world

Characteristics of smallholder segments[51]					
	Land	Crops	Market engagement	Access to technology	Access to finance
7% of total smallholders	>2 ha	Cash crops, some staple	Little subsistence, surplus sold to formal buyer	Good	**Informal, some formal, some through buyers**
33% of total smallholders	1–2 ha	Staple crops, some cash	Some subsistence, surplus sold to intermediar or formal buyer (co-op agribusiness)	Limited	**Limited and informal**
60% of total smallholders	<1 ha	Staple crops	Mostly subsistence, little surplus	Very limited, if at all	**Limited, informal if at all**

51. Framework adapted from ASFG and CGAP (2015), Inflection point: Unlocking growth in the era of farmer finance.

The economic lives of smallholder farmers are complex and their financing needs are varied

Figure 34 **Cash inflows and outflows of farmers**



Smallholder households have many cash inflows and outflows from formal and informal activities. For farmers in formal value chains, business-to-person (B2P) procurement payments represent 50 to 80 per cent of household income.

Commercial smallholder households often have sources of income from non-agricultural activities, for example, from informal work (e.g. street vending).

Farmers' primary financing needs are:

- **Short-term working capital** for inputs such as seeds and fertiliser;
- **Long-term capital** (more than a year) for crop improvements, irrigation systems and other farm investments; and
- **Non-agriculture related financing** for a range of expenses (e.g. health costs, weddings, funerals).

A farmer's financing needs depend on many factors

Value chain, farm location, time of year and farm size all dictate a farmer's agriculture-related financing needs. For agricultural activities, there is a significant outlay of cash at the start of the growing season, for example, to pay for seeds and hire labourers to till the land. Farmers then have negative cash flow until they can harvest and sell their crops.

Non-agriculture related financing needs can be less predictable. They are based on the needs of a farmer's household or on other economic activities.

Agriculture-related financing needs		Non-agriculture related financing needs
Short term:		
Inputs (e.g. seeds, fertilisers, seedlings)		Emergency expenses (e.g. in the aftermath of an extreme climate event)
Hired labour (e.g. at time of sowing)		Business expansion (e.g. village shop)
Livestock feed (e.g. fodder)		Medical expenses (e.g. hospitalisation)
Long-term:		Education expenses (e.g. school fees)
Farming machinery (e.g. rice harvester)		Living expenses (e.g. food)
Farming tools (e.g. spades and hoes)		Repayment of another loan (e.g. informal loan)
Irrigation system (e.g. water pumps)		
Livestock (e.g. calves)		

To realise the full potential of agriculture, a huge surge in agricultural lending is needed

The high perceived risk of lending to farmers, the lack of collateral they can offer to lenders and the challenges they face in providing an accurate picture of their financial history all contribute to a gap in smallholder financing.

The total credit provided to smallholder farmers by informal and formal financial institutions, as well as value chain actors, only meets about 30 per cent ($68 billion) of the estimated need (≃$238 billion) in Sub-Saharan Africa, Latin America and South and Southeast Asia.

With a rising global population (8.5 billion by 2030), a significant increase in smallholder financing is needed to meet global food demand.

To realise their commercial potential, smallholders in formal value chains typically require about $1,500 in short-term financing and $1,500–$2,000 in long-term financing (amortised over multiple years).

Figure 35 **Smallholder credit provided by formal and informal institutions, 2019[52]**

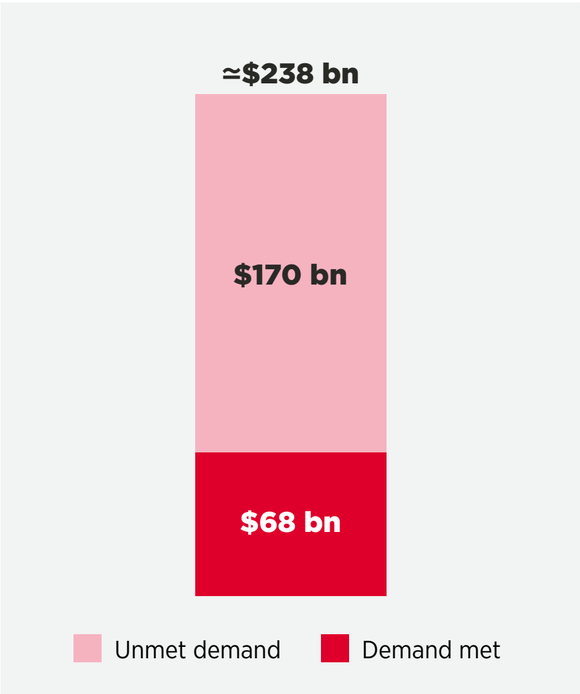
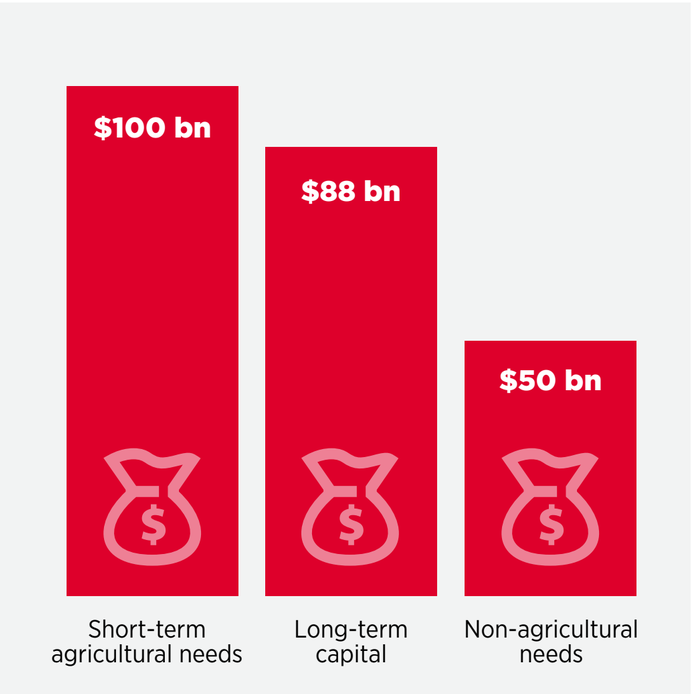


Figure 36 **Breakdown by type of financing need, 2019**

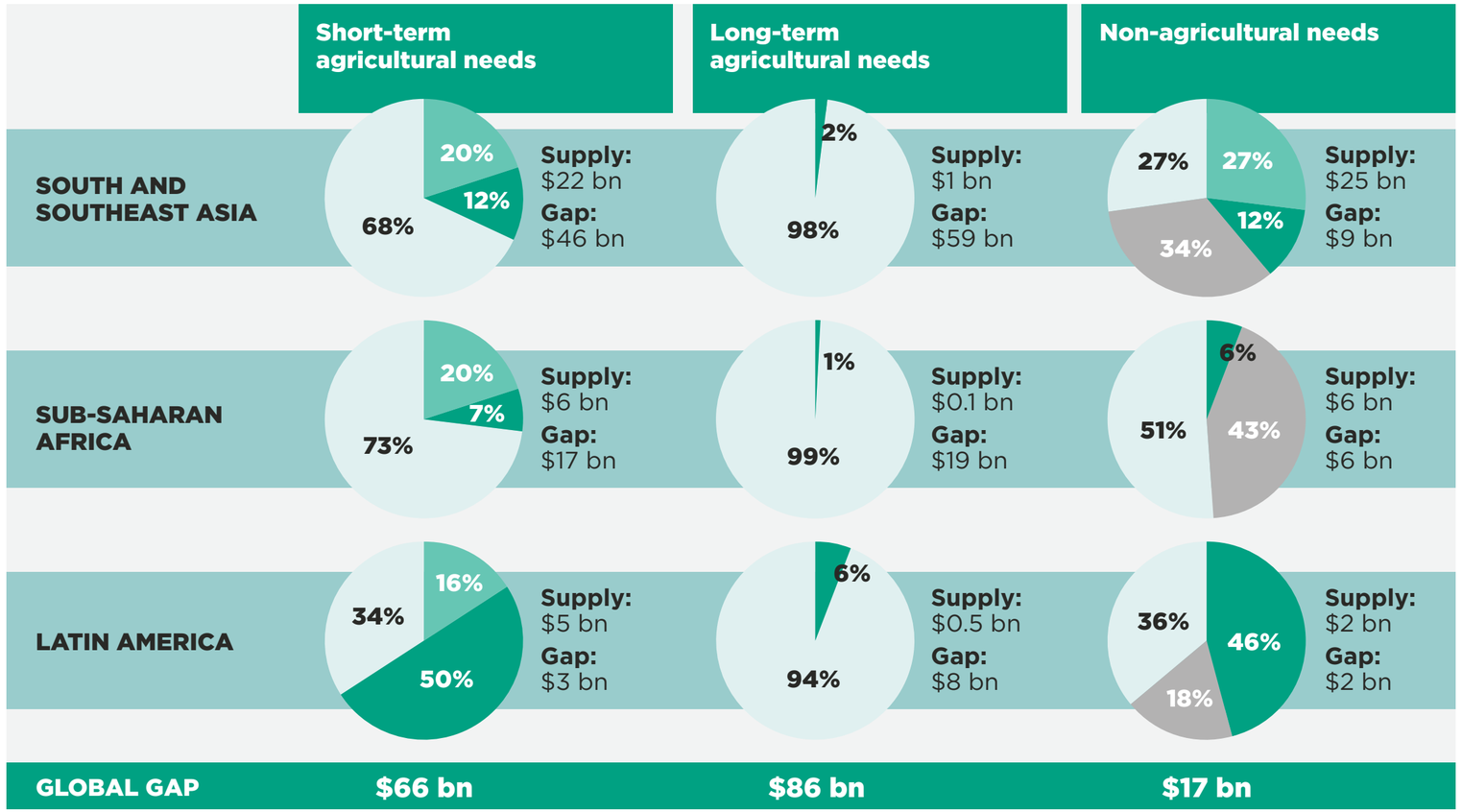


52. Source: Mastercard Foundation Rural and Agricultural Finance Learning Lab and ISF Advisors (2019) Pathways to Prosperity.

Globally, the main financing gap is for long-term working capital

The key agricultural financing gap is long-term capital for agricultural needs. Long-term financing enables farmers to invest in assets and expand and improve their agricultural activities, but this hinges on the availability of transactional footprints, such as recordkeeping, either digital or paper-based. However, even when farmers have records, such as physical receipts for the sale of crops to agribusinesses, the absence of standardised records and formats to present this information to FSPs makes it difficult for them to issue credit. Globally, there is a significant financing gap for all agricultural and non-agricultural needs. The gap is greater in Sub-Saharan Africa, largely because a smaller percentage of the population has a bank account.

Figure 37 **Financing gap by region and type of financing need (~$170 billion)[53]**

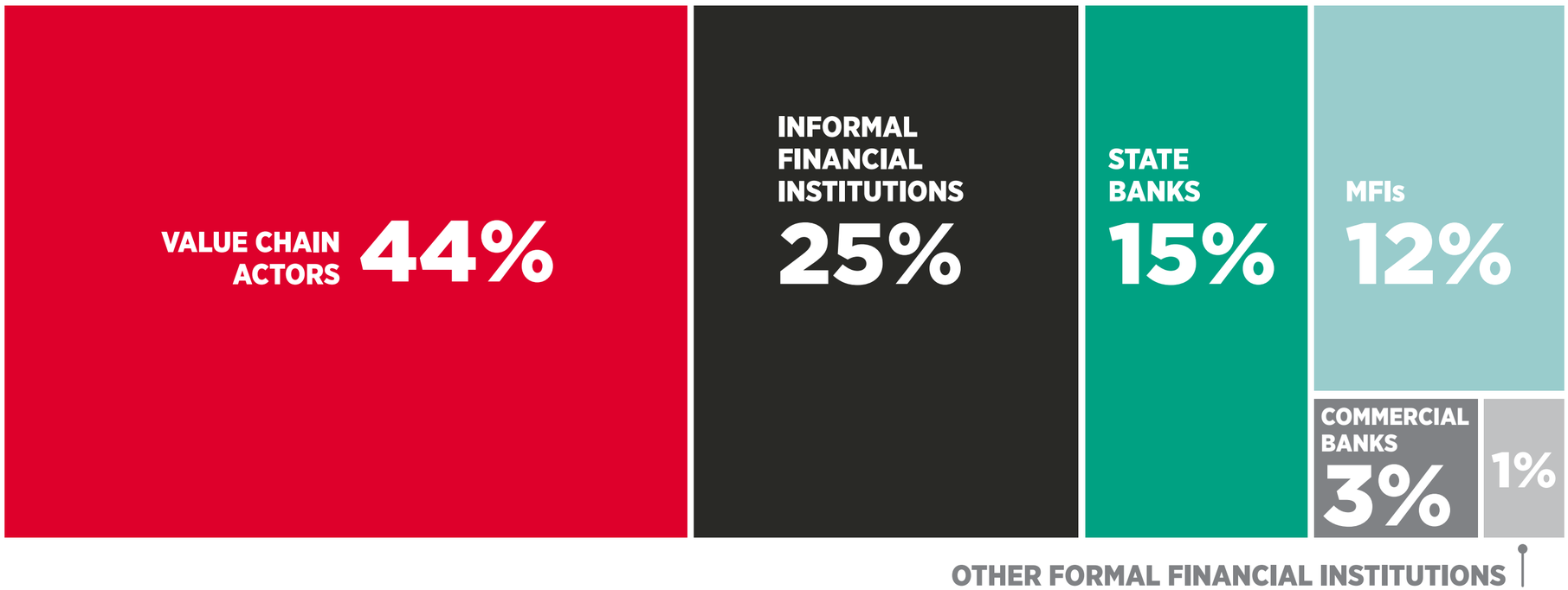


53. Source: Mastercard Foundation Rural and Agricultural Finance Learning Lab and ISF Advisors (2019), Pathways to Prosperity.

Globally, value chain actors provide 44 per cent of the total supply across all financing needs of farmers

Figure 38 **Current supply of financial services to smallholder farmers (~$68 billion)**

Value chain actors are the main providers of financial services for commercial farmers in tight value chains, and focus primarily on short-term financing for inputs (in-kind or cash advances). NGOs and MFIs address some of the needs of non-commercial smallholders, but still focus mainly on short-term financing. Few commercial FSPs cater to the financial needs of farmers due to the perceived risk of lending to the sector and the lack of collateral and financial histories.



54. Source: Mastercard Foundation Rural and Agricultural Finance Learning Lab and ISF Advisors (2019), Pathways to Prosperity.

Case study: Ibero Farmer Financing Unit, Uganda

Figure 39 **The agribusiness as an FSP: Ibero Uganda's Farmer Financing Unit**

Registration	QR code on a paper card given to all farmers.
Application	Farmer applies for a loan with the QR code. Agribusiness checks the farmer's records.
Agribusiness assessment	Agribusiness performs its own credit scoring using proprietary software. If the farmer is deemed too risky, agribusiness staff perform a site visit to check against risk criteria (farming practices, pesticide use).
Contract signing	Paperless contract signing (SMS-based) between farmer and agribusiness via FieldBuzz last mile digital tool.
Disbursement	Disbursement via mobile money, interest charged at 45 per cent per year (declining balance).
Monitoring	Monitoring via FieldBuzz last mile digital tool (i.e. checks whether farmer has purchased inputs).
Farmer repayment	Repayment in coffee with confirmation messages sent to farmers via SMS on percentage of loan repaid in-kind.

In 2017, Ugandan coffee agribusiness Ibero, the local unit of international group NKG, set up a fully fledged Farmer Financing Unit under the NKG Bloom[55] programme to provide fertiliser and seasonal cash advances to farmers. Ibero aimed to increase farm-level productivity by at least 75 per cent in two years.

As part of the NKG Bloom programme, the agribusiness performs credit risk analyses to assess whether to disburse credit to farmers. The agribusiness partners with agritech FieldBuzz, which has a smartphone tool to support loan disbursement (loan contract signing, farmer monitoring).

With annual repayment rates for cash advances at 70 per cent, the agribusiness initially took a considerable risk financing farmers, in addition to bearing the operational costs of running the Unit. As of 2019, the repayment rate was over 99 per cent.

Ibero's Farmer Financing Unit is part of a global effort by agribusinesses to provide working capital to famers. Ibero approached the challenge with a technology-based solution, which had the added benefit of greater transparency in the supply chain.

55. See: https://uganda.nkgbloom.coffee/

How to generate, share and use farmer data for financial inclusion?

Key questions

Data generation

1. What digital data is available to help farmers create an economic identity?
2. How does the digitisation of the agricultural last mile generate data that can be used to offer financial services to farmers?

Data ownership

1. Who owns the farmer and farm data that can unlock financial inclusion? Agribusinesses, farmers, MNOs?
2. How and to what extent is farmer consent being sought and obtained?

Data sharing

1. As digital data becomes available, what partnerships are emerging between stakeholders (value chain actors, agritechs, FSPs) to share data that can unlock financial inclusion for farmers?
2. What new operational models and supporting technologies are available to share data?
3. What new approaches to innovative credit scoring models are emerging?

Data use

1. What financial products are required to meet the needs of farmers?
2. What are the key considerations in designing financial products for farmers?

Digital agriculture solutions generate a range of data that can improve the provision of financial services for farmers

Data generation

Agritech companies capture a wealth of digital agriculture data that can support farmers in developing an economic identity. A digital footprint consists not only of farmer-level data (e.g. transactional data generated by mobile money); it may also extend to farm-level data (e.g. farming record data in a digital procurement tool) and location-based data (e.g. satellite-based data from a smart farming tool). Data can be structured, semi-structured or unstructured, and may not always be directly relevant for use in financial services. For example, satellite-based data used for disease monitoring, when combined with weather forecasting data, could be used for damage assessment and crop insurance payouts to eligible farmers.

	USE CASE	EXAMPLE DATA POINTS		
		KYC measures	**Regular sources of income**	**Loss mitigation**
ACCESS TO ASSETS	**Smart farming**	• Basic information • Farm information	• Ability to pay (mobile money transactional data)	• Machinery rental • Asset utilisation rate
ACCESS TO MARKETS	**Agricultural e-commerce**	• Basic information	• Net income (mobile money transactional data) • Production data	• Account ownership
	Digital procurement	• Basic information • Farm information	• Cultivation practices • Production data • Mobile money transactional data	• Expense tracking

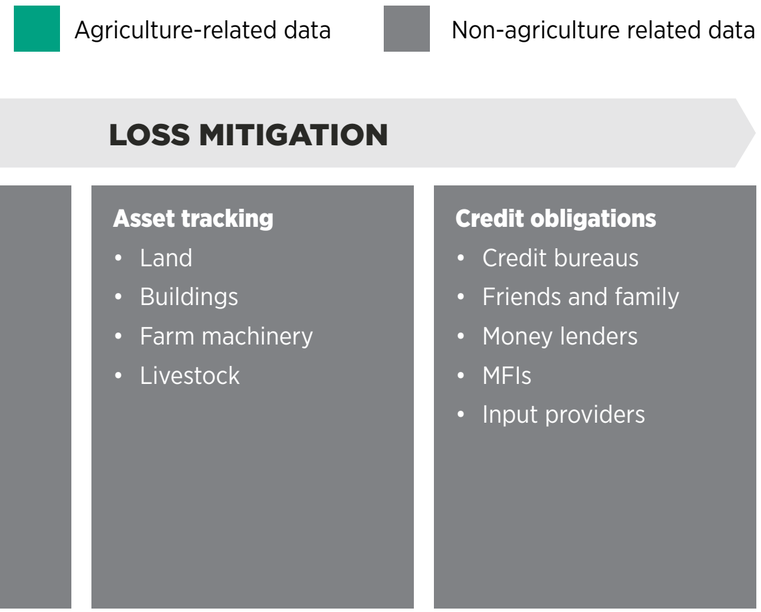
FSPs require a variety of agriculture and non-agriculture related data to support their credit decisions

Data generation

The FSPs actively targeting the agricultural sector require both agriculture- and non-agriculture related data to provide financial services to farmers. These include basic KYC measures, data on regular sources of income and data on collateral owned by the farmer.

Availability of data is a challenge across all categories. Lack of collateral is the primary data challenge, but acquiring KYC data and data proving regular income is also difficult, as agricultural production cash flows are inherently more difficult to estimate accurately and most procurement transactions are still made in cash and paper.

Figure 40 **Data needed for a loan application (example from Yoma Bank's Hire Purchase Scheme, Myanmar)**



Digital procurement: farmer, farm and agricultural data generated in the last mile help to build economic identities

Data generation

Agribusiness-farmer engagement

Last mile sourcing

- **Farmer recruitment**
- **Capacity building**
- **Farmer support and management**
- **Crop purchasing**
- **Payment**

Examples of value chain activities

Farmer recruitment	Capacity building	Farmer support and management	Crop purchasing	Payment
• Farm and farmer profiling • Farmer onboarding • Input provision	• Extension support • Farm development plans	• Sustainability • Certification • Traceability • Outgrower schemes	• Crop collection • Crop transportation • Quality control • Warehousing	• Crop payment • Receipt issuing

Opportunity for last mile digitisation

Farmer recruitment	Capacity building	Farmer support and management	Crop purchasing	Payment
Digital procurement tools enable targeted data collection. Digital tools ensure complete and accurate recording of data.	Mobile technology allows crop buyers to send notifications and disseminate information to farmers in a timely and cost-effective way.	Digital survey tools support personalised questionnaires and collection schedules, and track progress in real time.	Farmer notifies buyer of intent to sell via mobile. Collection schedule based on optimised routes is shared with farmers.	Mobile money enables the transition from cash to digital payments and creates transparent transactions. Digital notifications replace paper receipts.

Examples of data points generated

Farmer recruitment	Capacity building	Farmer support and management	Crop purchasing	Payment
Basic information • National ID • Mobile number • Number of household members	**Farm information** • Co-op membership • Farm acreage, location	**Agricultural activity** • Mix of crops and area cultivated • Number of harvests per year		**Agricultural activity** • Net income per harvest • Ability to sell harvest to buyer of choice

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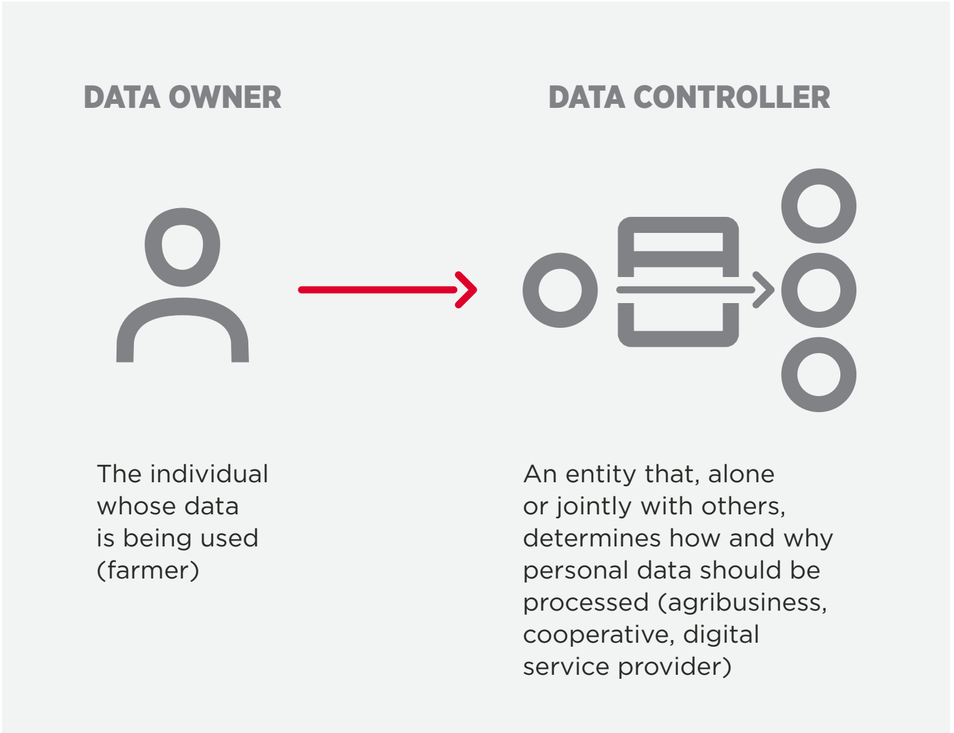
Farmers must be aware of who owns their data

Any time farmers provide data to third parties, data ownership and awareness of who owns their data become an issue. Data ownership can be ambiguous and must be clarified upfront.

In agricultural value chains, agribusinesses may often assume implicit ownership of farmer and farm data as they build their own historical records of transactions and relationships with suppliers. The same may hold true for agribusinesses selling inputs to farmers. While farmers' claims to personal data are indisputable, claims to farm data may be more challenging, especially because of the lack of land ownership titles in developing countries.

Digital service providers engaged in last mile digitisation initiatives (agritech and fintech companies, MNOs, etc.) usually ensure that farmers' consent is sought.[56] However, questions remain about how well farmers understand how their data is shared and for what purpose. Farmers should be informed of how and with whom their data might be shared, and explicit consent should be sought prior to any data being shared and the initiation of the registration process.

A key distinction must be made between the data owner (the farmer) and the data controller (agribusiness, cooperative, digital service provider). The data controller either transfers data to a specific third-party financial provider to perform a credit risk analysis or, in cases where the data controller underwrites the risk, they perform a credit risk analysis themselves.



56. In Indonesia, last mile digital tool HARA ensures farmers are aware of data sharing and understand the purpose of it. HARA uses an electronic authentication system that sends one-time passwords to farmers via SMS to request consent. In Kenya, agritech companies providers, such as Tulaa and Twiga Foods, ensure their agents explain to farmers how their data will be used. See GSMA (2019), AgTech Innovation Unlocks Economic Identities for Smallholder Farmers in Indonesia. See also GSMA (2019), Improving Financial Inclusion through Data for Smallholder Farmers in Kenya.

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Unlocking financial services for farmers requires participation and sharing of data between agritechs, FSPs and agribusinesses

Figure 41 **Unlocking financial services for farmers: Steps in data sharing**

	Data collection	Data aggregation	Data analysis	Risk modelling
Organisation	Agribusiness Agritech	Agritech FSP	Agritech FSP	FSP Agritech
Organisational capabilities required	Data storage and privacy	Data processing and warehousing	Business intelligence (data mining, predictive analytics)	Statistical analysis, financial analysis
Task	Collecting digital farm and farmer data. No data editing or analysis takes place.	Aggregating digital data from multiple sources, such as agritech tool data and satellite data. Some data editing is completed.	Data editing and analytics are conducted to varying degrees. Some farmer credit scoring may be completed.	Conducting a statistical analysis to establish a farmer's creditworthiness.
Outputs	Farmer database	Farmer's economic identity		Scoring model Credit report

Short-term working capital

Long-term capital

Non-agricultural financing

Data-sharing models for smallholder financing

Different data-sharing models have emerged depending on the roles of agritechs, FSPs and agribusinesses at each step of the process of adding value to digital farmer and farm data.

DATA-SHARING MODELS		DATA COLLECTION	DATA AGGREGATION	DATA ANALYSIS	RISK MODELLING
A	**Agritech as data provider**	Agritech	Agritech	Agritech/FSP	FSP
B	**Agritech as credit scoring enabler**	Agritech / third-party agritech	Agritech	Agritech	Agritech
C	**Agribusiness as data provider**	Agritech	FSP	FSP	FSP

A. The **Agritech as data provider model** includes agritechs that collect and aggregate digital farmer and farm data and may perform some data analysis (e.g. data editing). Data is then used by third parties, most likely FSPs, for risk modelling. This model, which is the most widely available, includes agritechs that support:

- Farmer and farm data collection and aggregation via last mile digital tools (e.g. Virtual City in East Africa);
- Collection of transactional data via e-commerce solutions (e.g. Twiga Foods in Kenya); and
- Centralised data hubs for farmer and farm data sharing (e.g. Hara in Indonesia).

B. In the nascent **Agritech as credit scoring enabler** model, agritechs expand their role to perform analytics that support part or the entire risk modelling process. They typically aggregate farmer and farm data from multiple sources (farmers, agribusinesses and open data, such as satellite-based vegetation indexes) and, in some cases, support data collection directly through their digital tools.

C. In the **Agribusiness as data provider model**, agribusinesses form one-to-one data-sharing partnerships with FSPs to enable agricultural loans to be disbursed to farmers. This model is less common and requires FSPs that actively target the rural segment and take a proactive role in data aggregation, data analysis and risk modelling.

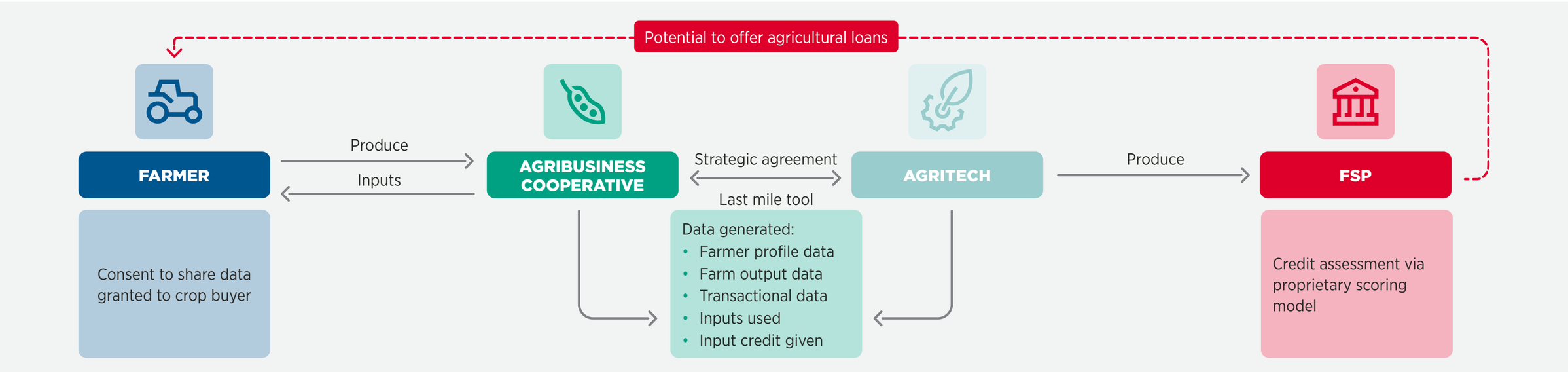
Agritech as data provider: data collection and aggregation using last mile digital tools

Data sharing

The ability to collect, aggregate and expose data to an FSP for credit scoring is an important value addition to a last mile digital tool for agribusinesses and farmers. In East Africa, agritech company Virtual City offers a last mile tool, Agrimanagr,[57] that collects and aggregates KYC data on farmers, as well as data on their economic activities, such as real-time updates on inputs used, quantity and quality (i.e. grading) of produce sold, pricing and payments data. Farmers give consent to the agribusiness or cooperative field agent operating the Agrimanagr app to share their data directly with banks.

In collaboration with its agribusiness and cooperative clients, Virtual City is forming partnerships with banks to enable agricultural loans to be disbursed to farmers.

Figure 42 **Data collection and aggregation using last mile digital tool: Virtual City's Agrimanagr**



57. See: GSMA (2019), Bringing efficiency to Kenya's dairy value chain: Virtual City's Agrimanagr.

Agritech as data provider: collection of transactional data via e-commerce solutions

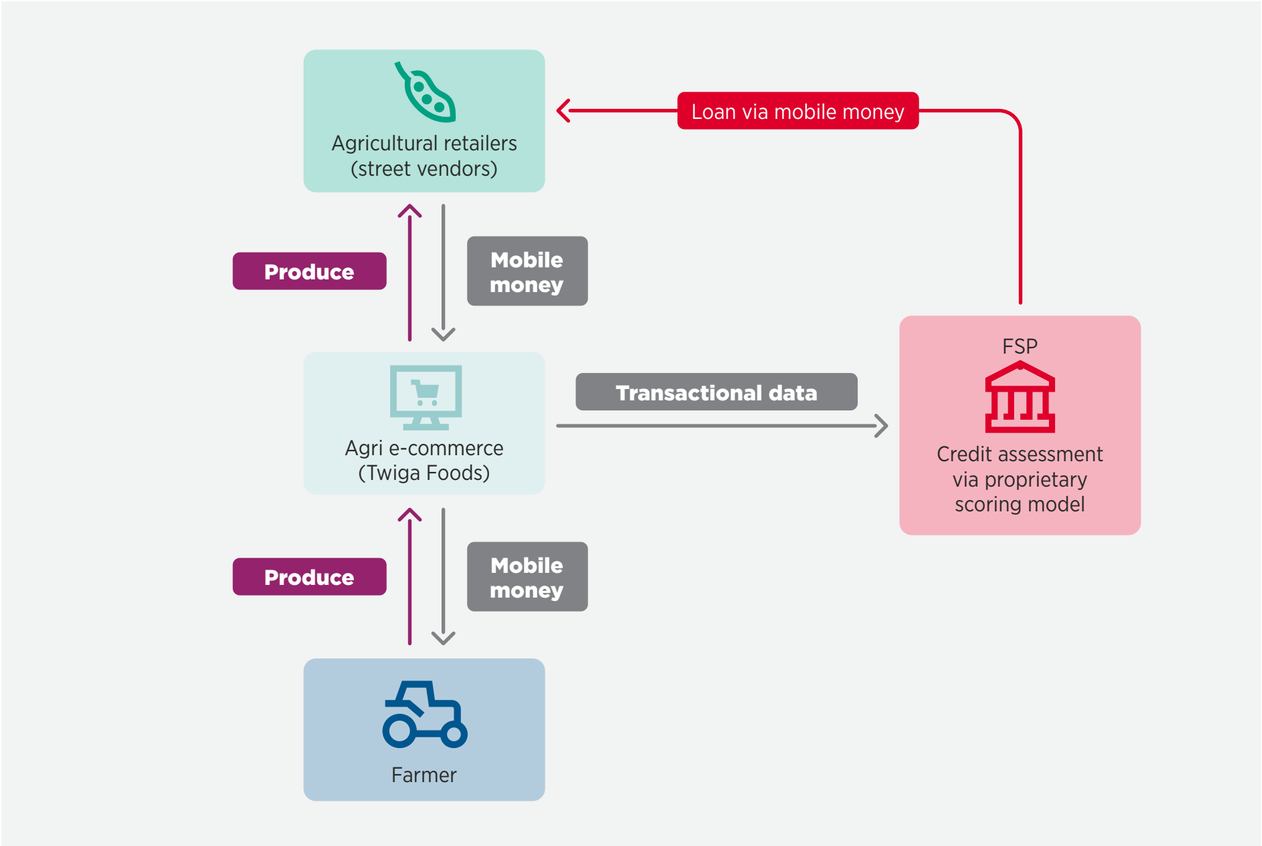
Data sharing

Agri e-commerce refers to market linkage tools that formalise agricultural value chains by connecting crop producers and buyers through a mobile-based online platform. In mobile money markets, agri e-commerce services are increasingly integrated with mobile money to support digital payments, generating useful transactional records for credit scoring.

The most advanced agri e-commerce companies are taking on the role of aggregators in the agricultural last mile, performing logistics, warehousing and identifying producers and buyers. In doing so, they are taking on the traditional role of agribusinesses, from procuring and selling crops to enabling farmers to access financing.[58]

In Kenya, agri e-commerce company Twiga Foods, a business-to-business platform connecting farmers to street vendors, is enabling financial inclusion for downstream stakeholders in the value chain by sharing data with FSPs. Street vendors purchasing produce from Twiga Foods can access short-term loans via mobile money to finance their stock. The loan repayment and transaction histories of vendors are taken into account for future credit, and Twiga Foods can monitor vendors' creditworthiness and provide preferential repayment and interest rates. Despite growing demand, loans are only offered to smallholder farmers on a limited and informal basis. However, there is potential to expand Twiga's model to also enable farmers to access formal loans.

Figure 43 **Collection of transactional data via e-commerce: Twiga Foods' stock financing loan**



58. Examples include TaniHub in Indonesia, AgroCenta and FarmCrowdy in Nigeria, Twiga Foods in Kenya.

Agritech as data provider: centralised data hubs

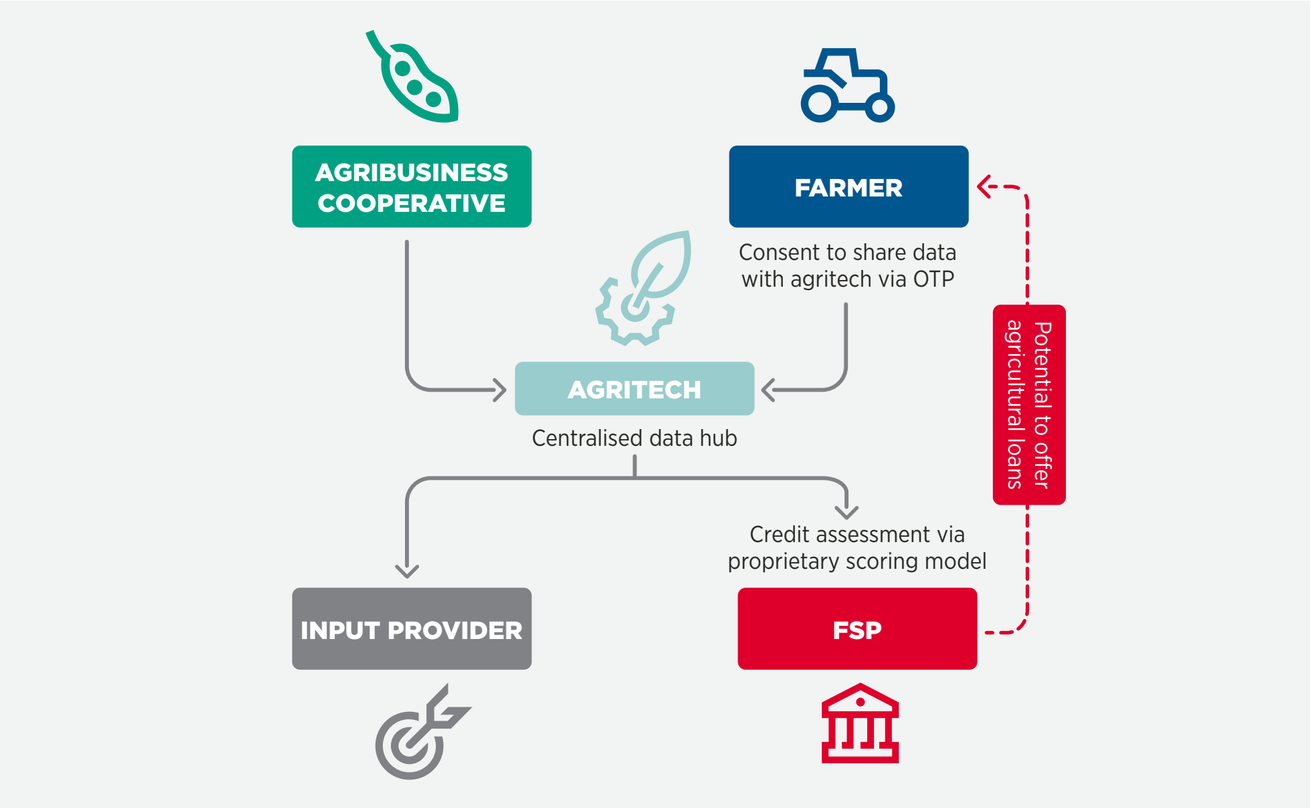
Exposing a greater quantity and variety of data points to a wider range of data users (e.g. FSPs) under a centralised data exchange model could greatly improve credit risk analysis and make more financial services available to farmers.

Centralised data sharing models (data hubs) allow for multiple data providers (e.g. agribusinesses, cooperatives, farmers) to provide data to multiple data users interested in the data (banks and other parties, such as input suppliers, insurers and government). By centralising the collection of farm and farmer data, they are making data more accessible, facilitating rich analytics and enabling data-driven decision making.

Agriculture-focused centralised data hubs have emerged in markets like Indonesia (e.g. Hara) and Nigeria (e.g. Verdant). In Indonesia, Hara's electronic authentication system sends one-time passwords to farmers via SMS to request their consent every time they share data.

The use of blockchain technology offers potential for more secure, traceable and transparent exchange of data. Agritech companies BanQu in Nigeria and Hara in Indonesia both use blockchain technology for data sharing.

Figure 44 **Centralised data hub: the Hara ecosystem in Indonesia[59]**



59. See GSMA (2019), AgTech Innovation Unlocks Economic Identities for Smallholder Farmers in Indonesia.

Agritech as credit scoring enabler: data analysis and risk modelling solutions

Beyond collecting and aggregating data, agritechs could play a role in analysing it, which leads to credit scoring. Agritechs may perform varied degrees of data analytics. At the most basic level, they may simply edit and clean the data to make it usable before providing it to FSPs for credit scoring. In some cases, the most specialised agritechs conduct a statistical and financial analysis to produce actual credit scores.

CASE STUDY

Myanmar's Impact Terra analyses data for partner bank

Myanmar's Impact Terra is an example of an agritech performing advanced analytics on farmer and farm data. In 2019, the company conducted a pilot with partner FSP Sathapana Bank to use data collected on maize farmers via its digital tool for credit scoring. With farmers' consent, Impact Terra analysed data to populate detailed profiles of farmer segments on behalf of the FSP, which then fed into a customised farmer credit scoring model run by the bank.

CASE STUDY

Kenya's FarmDrive enables credit scoring for farmers

In Kenya, agritech FarmDrive collects self-reported data directly from farmers (records of expenses, yields, revenue) and aggregates it with a range of alternative data sources (satellite-based environmental and agronomic data). It then analyses the data with a machine learning algorithm to produce relevant credit scores for farmers, as well as decision tools that enable several FSP partners, such as Kenya Commercial Bank (KCB), to develop agricultural loan products. Farmers then receive loans via mobile money (M-Pesa).

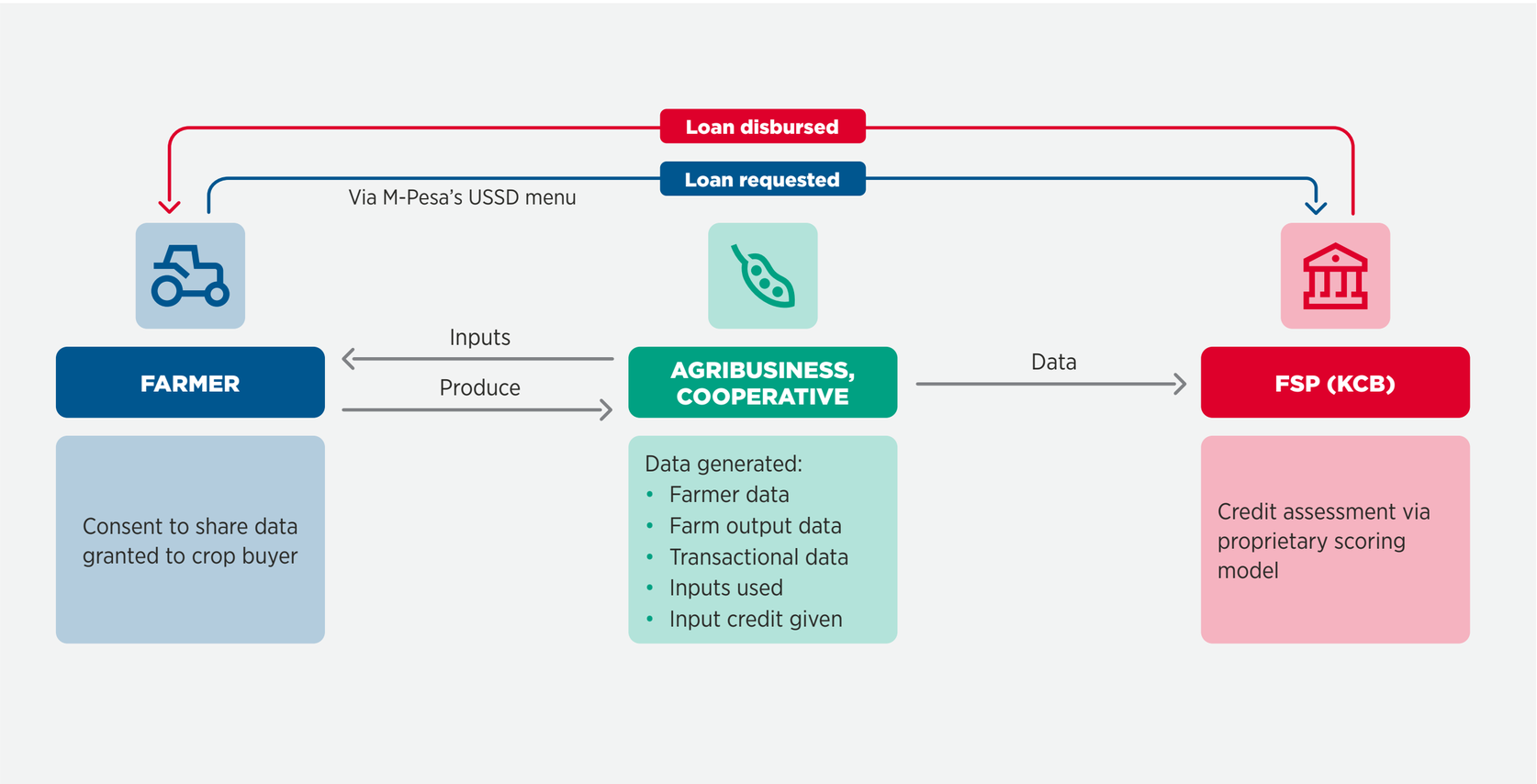
Agribusiness as data provider: one-to-one data-sharing partnerships – the example of KCB's MobiGrow

Data sharing

KCB MobiGrow service aims to promote financial inclusion among smallholder farmers in Kenya and Rwanda by partnering with crop buyers (agribusinesses and cooperatives). Under the partnership, KCB directly accesses farm, farmer, transaction history and value chain data held by the crop buyers, and uses a proprietary credit scoring algorithm to determine a farmer's creditworthiness.

In Kenya, MobiGrow uses M-Pesa's established infrastructure as a distribution channel to provide farmers with credit and savings accounts. Farmers working with partner agribusinesses and cooperatives create a KCB MobiGrow account and access the service via the M-Pesa USSD menu. They can then request a loan based on their needs and, if successful, it is deposited into their MobiGrow account. Farmers can push funds to their M-Pesa account (for a small fee) or withdraw the money via agents. Repayments are made over one, three or six months.

Figure 45 **One-to-one data-sharing partnership: KCB and agribusiness partner**



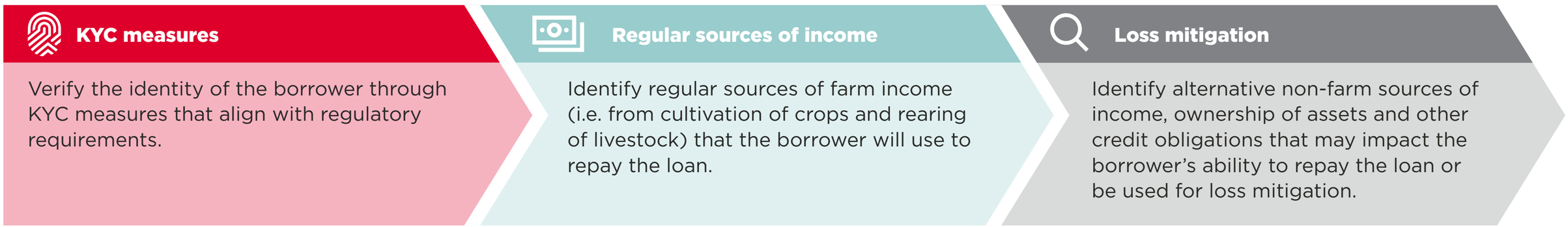
Digital data could address data gaps and speed up the credit scoring process

Data sharing

FSPs must collect and analyse a range of data about their customers to generate a numeric score (i.e. credit score) that is used to calculate the risk profile of the borrower. A credit score is an expression of a farmer's apparent creditworthiness that is used to make underwriting decisions. Typically, credit scoring for smallholder farmers has involved analysing the few data points available, such as repayment records and current customer data on collateral, in order to understand future repayment risks. Data comes from traditional sources, such as surveys, demographic information or credit bureau data. However, unbanked farmers who have not received loans from FSPs in the past are unlikely to have a file in a credit bureau.

In the absence of alternative sources of data, credit scoring is a time-consuming process in which data is collected at a farm by loan officers who may store information as paper copies or in digital format. Data is then taken to the office for analysis and the farmer's credit score is calculated. Agritech solutions not only address critical data gaps in the credit scoring process, but also present an opportunity to speed up the credit scoring process with data readily available in digital format.

Figure 46 **Typical steps in the credit scoring process**

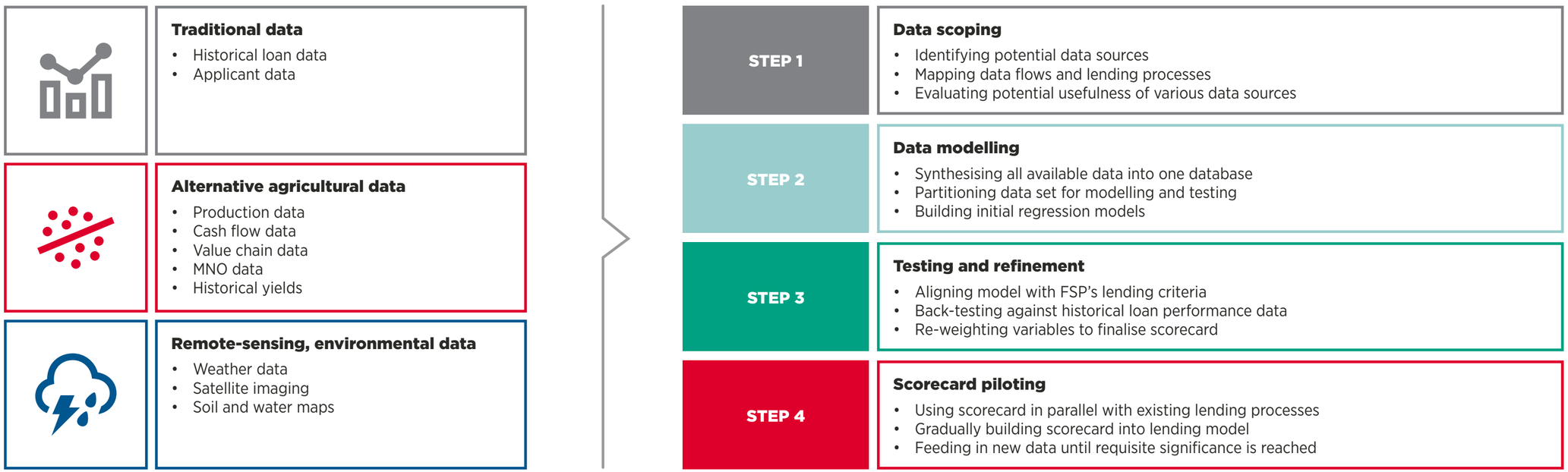


Emerging credit scoring methods are integrating traditional data sets with digital agricultural data

Emerging approaches to credit risk analysis rely on alternative agricultural data, including agritech-generated data and, increasingly, remote-sensing data. Historical production data and vegetation indexes from satellites, for example, could improve predictions of potential yields, which are crucial to assessing a farmer's creditworthiness.

In 2018, a joint initiative in Uganda between CGAP, fintech firm Harvesting and the PRIDE Microfinance network in Uganda, tested a variety of data types for credit scoring. A key lesson from this initiative was that while the use of new data sets alone does not improve credit risk analysis, new data sets that are high quality (i.e. from automated collection processes versus self-reported data) do improve credit scoring.

Figure 47 **Steps in credit scoring**



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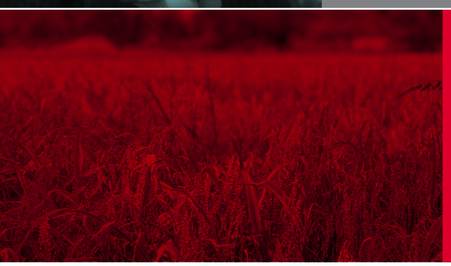
Data ownership

1. Who owns the farmer and farm data that can unlock financial inclusion? Agribusinesses, farmers, MNOs?
2. How and to what extent is farmer consent being sought and obtained?

Data sharing

1. As digital data becomes available, what partnerships are emerging between stakeholders (value chain actors, agritechs, FSPs) to share data that can unlock financial inclusion for farmers?
2. What new operational models and supporting technologies are available to share data?
3. What new approaches to innovative credit scoring models are emerging?



Data use

1. What financial products are required to meet the needs of farmers?
2. What are the key considerations in designing financial products for farmers?

Credit products should address farmers' needs and circumstances, which vary throughout the year

Data use

Figure 48 **Ghana's cocoa farmers: crop calendar with cash inflows and outflows[60]**

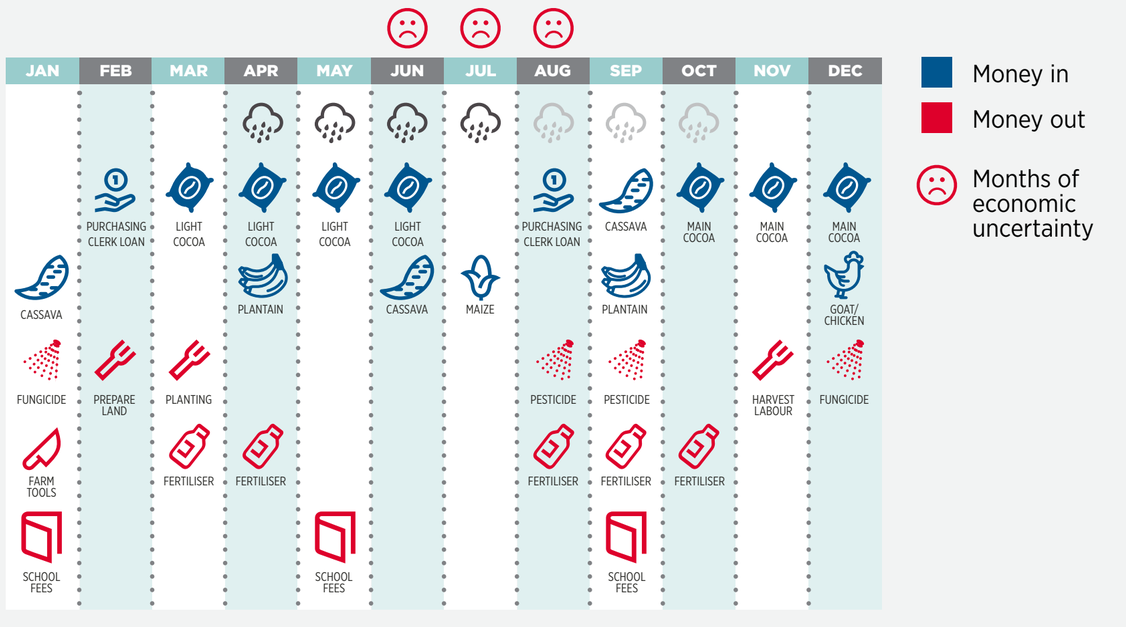
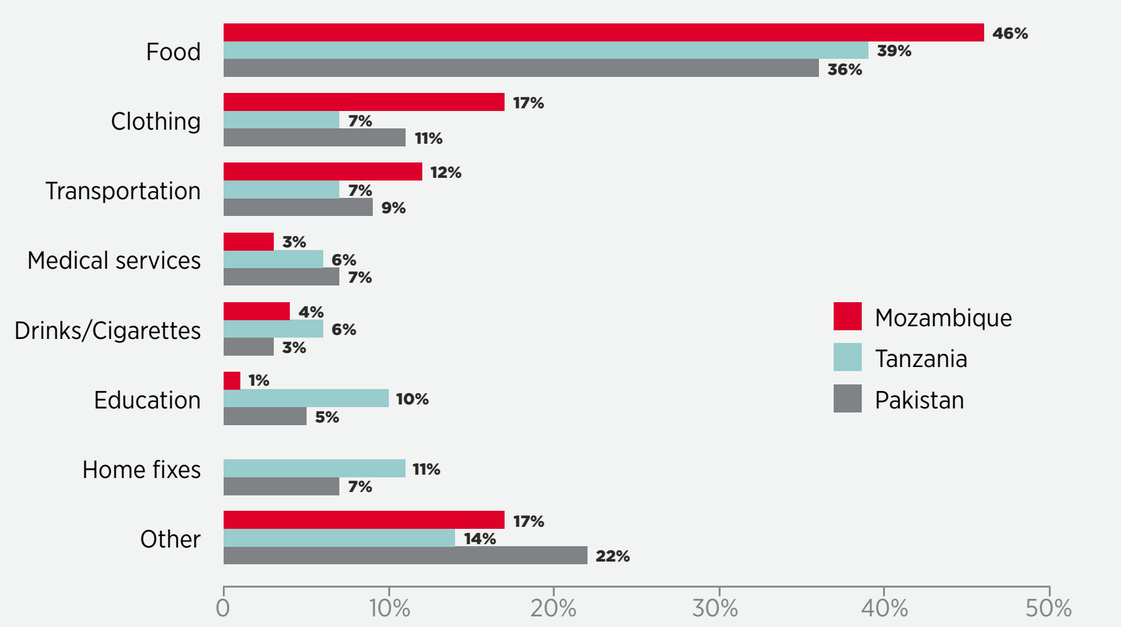


Figure 49 **Median share of consumption expenditures on various household needs[61]**



The demand for loans by smallholder farmers is closely tied to the seasonal nature of their income, which fluctuates throughout the growing season. During the year, farmers also have many cash outflows that can influence their ability to pay back loans. Research from CGAP in Tanzania, Mozambique and Pakistan has shown that farmer household expenses are smoother than income, but still fluctuate. Main expenditures vary across countries. Besides basic needs such as food and clothing, major expenditures for farmers include education, transportation and health services.

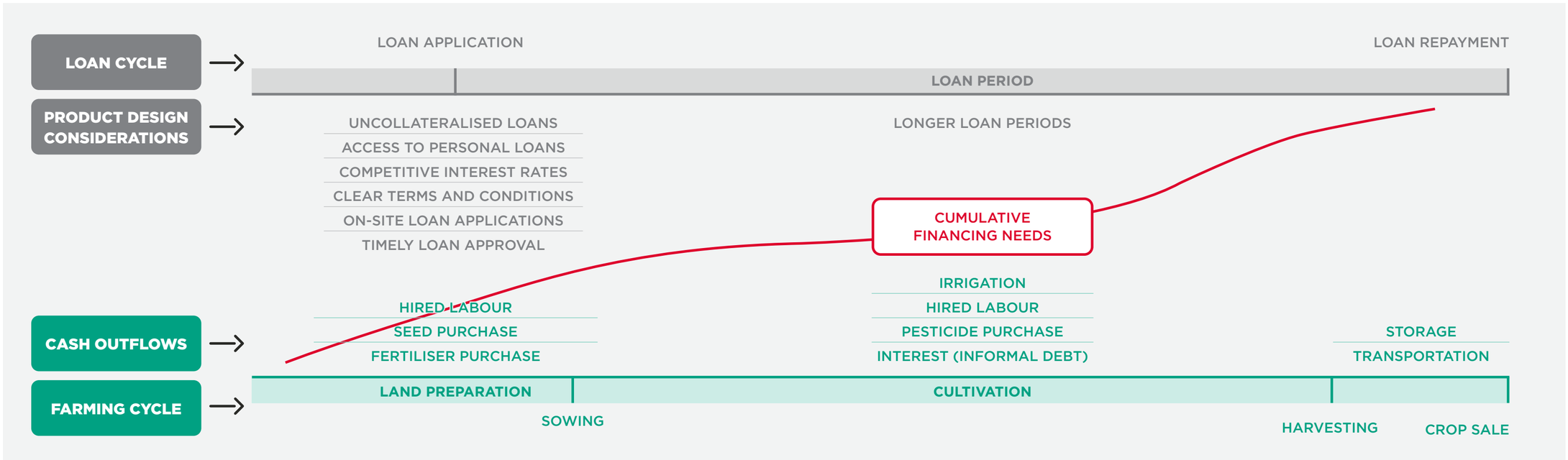
60. Source: GSMA (2019), Mobile-Enabled Economic Identities for Smallholder Farmers in Ghana.
61. Source: CGAP (2016), Smallholder diaries. Building the Evidence Base with Farming Families in Mozambique, Tanzania and Pakistan.

Effective credit product design depends on understanding the cash outflows of rural households

Data use

Together with offering products that consider the seasonality of farmers' incomes, it is vital to design financial products that are customised to farmers' circumstances, needs and revenue-generating activities. The "farming journey" varies between value chains and geography, and user research is required to reveal it fully. FSPs must also consider issues like a gender-neutral approach to credit, for example, allowing collateral registered under women's names, loans that cover a range of crops, models that allow access to higher priced items (e.g. machinery) and transparency in data ownership and sharing.

Figure 50 **Product design considerations throughout the farming cycle[62]**



62. Source: GSMA (2019), Digital credit scoring for farmers: Opportunities for Agritech Companies in Myanmar.

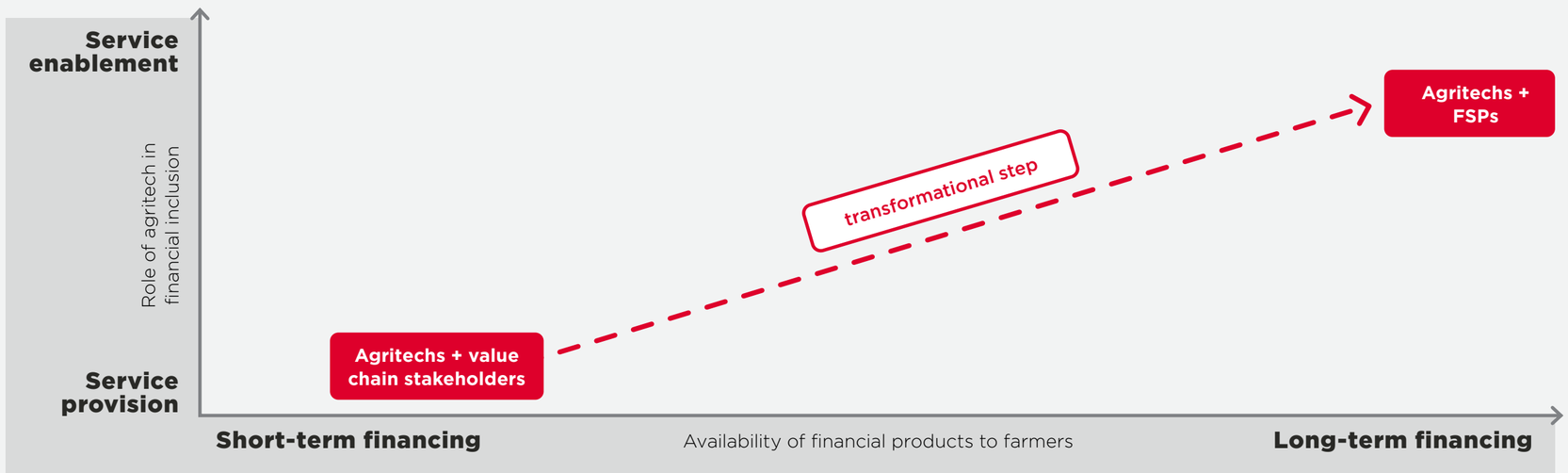
Agritechs have a role to play in short-term financing, but true social innovation lies in long-term financing

Data use

As more digital farmer and farm data becomes available, agritechs are playing a greater role in short-term input financing by offering solutions that digitise farmer and farm data. With more transparency from suppliers, value chain actors can provide farmers with short-term working capital.

Success and scalability will require strategic partnerships between agritechs and FSPs that target the rural sector. A transformational step in smallholder financing is the use of digital farmer and farm data for long-term financing (>one year) that enable farmers to invest in farm assets. This kind of transformation requires digital innovation in data generation, data sharing among interested parties and data use. It also requires agritechs to play a greater role as credit scoring enablers.

Figure 51 **Transformational step in farmer financing**



Smallholder financing must support climate adaptation and resilience for farmers

Data use

With climate change, smallholder finance is becoming more aligned with climate-smart finance. Climate-smart finance refers to financial instruments that support and account for climate change adaptation and mitigation objectives.

Examples of climate-smart finance in the agricultural sector include:

- Loans for high-quality inputs, including climate-resistant seeds, fertiliser and crop protection (short-term financing);
- Loans for assets that improve climate resilience, such as water pumps and drip irrigation systems (long-term financing); and
- Insurance products.

In addition to agricultural asset financing products, agricultural insurance (digital and traditional) is the least available financial product for smallholder farmers. In 2018, only three per cent of smallholder households in Africa and 22 per cent in South and Southeast Asia had access to any kind of agricultural insurance.

Examples are:

- Weather index insurance that protects farmers against severe weather resulting in crop failure;
- Generic crop insurance (not based on weather indexes) that protects and compensates farmers against yield losses; and
- Livestock insurance to help pastoralists deal with livestock losses, largely due to drought and forage losses.

There is an urgent and growing need to design climate-smart financial products, including climate insurance. There is an opportunity to use digital farmer and farm data both for credit profiling and insurance risk profiling. Climate-smart products can also greatly benefit from integration with satellite-based environmental data (weather data, vegetation indexes, soil maps). Crucially, the availability of insurance for climate adaptation can help unlock agricultural credit as it serves as collateral for loans and eases the process of assessing the creditworthiness of farmers.

Key findings and recommendations

- Digital agriculture tools that enable access to markets have significant potential to generate data for the creation of economic identities for farmers. Digital procurement solutions and e-commerce services make it possible to collect valuable data on the economic activities of farmers. These tools also capture critical transactional data on income from the sale of crops, especially when they are integrated with mobile money.

- MNOs can play a pivotal role in enabling effective data-sharing partnerships by bringing together agritech companies, agribusinesses and FSPs. With key assets such as customer relationships (farmers and agribusinesses), mobile money and connectivity, MNOs have an important role to play in scaling the specialised solutions for the digitisation of the agricultural sector developed by agritech companies. They are also well placed to take a lead in engaging with FSPs to develop digital financial services for the rural sector.

- The rich data that agritech companies generate is already helping to extend short-term working capital to farmers. The most impactful and transformational step, however, is using technology to enable long-term working capital for farmers. This shift requires partnerships between agritech companies and FSPs. When FSPs do not have the capacity to invest in credit scoring solutions, there is an opportunity for agritech companies to expand their value proposition from data collection, aggregation and analysis to risk modelling.

- There is a market need and business opportunity to rethink credit product design for the rural sector and to:
  - Design agricultural credit products around the demands of smallholder farmers at different stages of the farming cycle;
  - Take into account the cash inflows and outflows of farmers when structuring the stages of the loan cycle; and
  - Shift focus to enabling products that support the climate resilience of farmers, including agricultural insurance.

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