Mobile-enabled Economic Identities for Smallholder Farmers in Ghana

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Mobile-enabled economic identities for smallholder farmers: key considerations from Ghana

Introduction

The third Global Findex shows transformational change in financial inclusion around the world. Five hundred and fifteen million more adults reported owning a financial account in 2017 than in 2014.[1] Despite this remarkable growth, 1.7 billion adults worldwide are still unbanked, with 20 per cent citing a lack of documentation as one of the barriers to opening a financial account. Globally, an estimated one billion people do not have an official identity document,[2] most of whom live in Sub-Saharan Africa and Asia, and a disproportionate share in lower-middle income markets. Without an ID, many are unable to vote, open an account at a financial institution, access health and education services, obtain legal protection and social security benefits, register for a mobile subscription in their own name or participate in the formal economy.

The identity gap is more acute in rural areas[3] where the ability to prove who you are can help determine whether you access a mobile connection, financial services or social protections. A larger proportion of rural populations live in poverty, are vulnerable to harsh climatic conditions and lack access to information services and technology. In Ghana, people living in smallholder households, who represent 46 per cent of the total population,[4] have limited access to agro-climatic information and to financial services needed to invest in farm equipment and quality inputs. As a result, productivity suffers, with cereal yield per hectare still under the minimum global threshold.[5]

In rural areas of many developing economies, certain services are still inaccessible, even where formal foundational identity coverage is relatively high. For rural populations, a "fixed identity" (the demographic and/or biometric details recorded on one's identity document) does not necessarily reflect their more dynamic economic profile, which includes data on one's varied economic behaviour,

1. Global Findex Database 2017. World Bank, 2018. https://globalfindex.worldbank.org/
2. ID4D Global Dataset. World Bank, 2018. http://id4d.worldbank.org/global-dataset
3. Identification for Development: Strategic Framework. World Bank ID4D Programme, 2016. http://pubdocs.worldbank.org/en/179901454620206363/Jan-2016-ID4D-Strategic-Roadmap.pdf
4. AGRA Ghana Operational Plan. AGRA, 2017. https://agra.org/wp-content/uploads/2018/01/AGRA-Ghana-Operational-Plans-_03.11.2017.pdf
5. World Bank Dataset. World Bank, 2018. https://data.worldbank.org/indicator/AG.YLD.CREL.KG?view=map

economic history and shifting economic circumstances. As GSMA research in Sri Lanka found, those who are "unable to provide a detailed profile of their economic circumstances or validate other vital credentials (for example, in the case of smallholder farmers, income and transaction histories, ownership of land, crop types, geolocation or farm size) are more likely to face barriers accessing formal services or connecting to the global economy".[6]

This report is based on joint research and in-country engagement by the GSMA Mobile Money and Digital Identity programmes. The aim of this research was to investigate the financial and identity needs of smallholder farmers in Ghana and to understand the unique position of mobile network operators in developing economic profiles that are specifically designed to address the financial inclusion challenges that these farmers face.

The report highlights key research findings that show how the ubiquity of mobile technology has created a platform for gathering, storing and processing data on the economic behaviours of end users, including smallholder farmers. Such platforms enable significant benefits to those who struggle to access formal financial services due to the fact that their financial history is comprised of economic behaviour that is cash-based, varied, inconsistent and undocumented.[7]

To understand the digital services access gap (including financial services) for smallholder farmers in Ghana, our research focused specifically on the economic behaviours, challenges and needs of cocoa farmers, as the cocoa industry is a major source of employment for over 800,000 rural families in six of Ghana's 10 regions.[8] Globally, Ghana is the second largest producer of cocoa beans (after Côte d'Ivoire). Cocoa is Ghana's second largest commodity export (18 per cent) after gold, and out of a total population of 28 million people, two million live in households which rely on smallholder cocoa farming.[9] Our research consisted of a mix of end-user focus group discussions, surveys and interviews with stakeholders that engage with this value chain, and aimed to answer the following questions:

- What types of identity documents are available to smallholder cocoa farmers in Ghana in practice, and which ones are accepted as valid forms of identity when farmers need to access specific services?

- What are the challenges of driving the use of digital financial services, from both a supply and demand perspective?

In-depth interviews with smallholder farmers and other stakeholders in the cocoa value chain (e.g. agri-businesses, purchasing clerks, financial services providers, input providers), generated several important insights and considerations that provide a starting point for MNOs as they consider their role in the economic identity space in Ghana's agricultural sector.

It became clear that by digitising and documenting a smallholder farmer's economic behaviour in an accessible, mobile-enabled platform, we can begin to understand their economic identity. This identity can then be used to authenticate and verify relevant data from other sources, and to offer new and better-targeted financial services with an assurance that the data is linked to a secure SIM card which has gone through a robust "Know Your Customer" (KYC) process.[10]

These findings are in line with research conducted by the GSMA's mAgri programme, which found that "the transition from cash to mobile money payments for the procurement of crops can support the creation of an economic identity for farmers via digital records from the sale of agricultural produce, which, in conjunction with other data points, open up to full financial inclusion (access to credit, insurance and saving accounts)".[11]

6. *Digital Identity for Smallholder Farmers: Insights from Sri Lanka*. GSMA, 2018. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/03/DigitalIdentity_SmallholderFarmers_SriLanka.pdf
7. *Enabling Digital Development: Digital Identity*. World Bank, 2016. http://documents.worldbank.org/curated/en/896971468194972881/310436360_20160263021000/additional/102725-PUB-Replacement-PUBLIC.pdf
8. Ghana Cocoa Board, 2018. https://www.cocobod.gh/home_section.php?sec=1
9. *Opportunities in Agricultural Value Chain Digitisation: Learnings from Ghana*. GSMA, 2018. https://www.gsma.com/mobilefordevelopment/programme/mobile-money/opportunities-in-agricultural-value-chain-digitisation-learnings-from-ghana/

1. Economic activities and behaviours of smallholder farmers in Ghana

Over 50 per cent of adults in Ghana have a mobile phone and mobile money usage is growing rapidly: 42 per cent of adults had a mobile money account in 2017 compared to just 12 per cent in 2014.[12] Over 45 per cent of the country's 28 million citizens are employed in agriculture,[13] which contributed to 19.5 per cent of GDP in 2016.[14] Most agricultural workers live in rural areas and practice smallholder, traditional or rain-fed farming. These farmers struggle to increase yields largely because of limited access to information on sound farming practices, credit, input and other resources and markets.[15]

The following farmer archetype is a composite of smallholder farmers we interviewed in key cocoa-producing areas in Ghana's Ashanti and Western regions. The profile illustrates the fluid and dynamic economic activities of the country's cocoa farmers, which are common to smallholder farmers across the developing world.

KWAME AND ABA, COCOA FARMERS

Photography credit: 17 Triggers/C.Zanzanaini

BASED ON INTERVIEWS WITH COCOA FARMERS IN THE ASHANTI AND WESTERN REGIONS	
Gender	Male and Female
Age	45
Family	Married with 6 children (help on the farm on Saturdays)
Literacy	Basic – can read Twi, know some English
Phone	Feature phone
Mobile money	Use mobile money to send/receive and to store money when travelling
ID	Voters card, health insurance card, farmers' group card

12. Global Findex Database 2017. World Bank, 2018. https://globalfindex.worldbank.org/
13. The latest data from the International Labour Organization (ILO) indicates that the share of agriculture in total employment in 2013 was 45.2 per cent. ILOStat Country Profiles: Ghana. International Labour Organisation, 2018. https://www.ilo.org/ilostatcp/CPDesktop/?list=true&lang=en&country=GHA
14. World Bank dataset. World Bank, 2018. https://data.worldbank.org/country/ghana
15. AGRA Ghana Operational Plan. AGRA, 2017. https://agra.org/wp-content/uploads/2018/01/AGRA-Ghana-Operational-Plans-_03.11.2017.pdf

KWAME AND ABA, COCOA FARMERS

THEIR FARM	
Land size	3 – 6 acres (may be separate parcels that add up to 10+ acres)
Main crop	Cocoa
Other crops	Maize, cassava, plantain, cocoyam, vegetables
Primary income	**Cocoa**: ~8,500 Ghana cedis/year (GHS) (15 – 20 bags/season at 475 GHS) **Livestock**: 300 Ghana GHS/goat; 1,000 GHS/pig; 35 **Side business (shop)**: ~500 GHS/month **Rent out:** Cars, bicycles', rooms

Photography credit: 17 Triggers/C.Zanzanaini

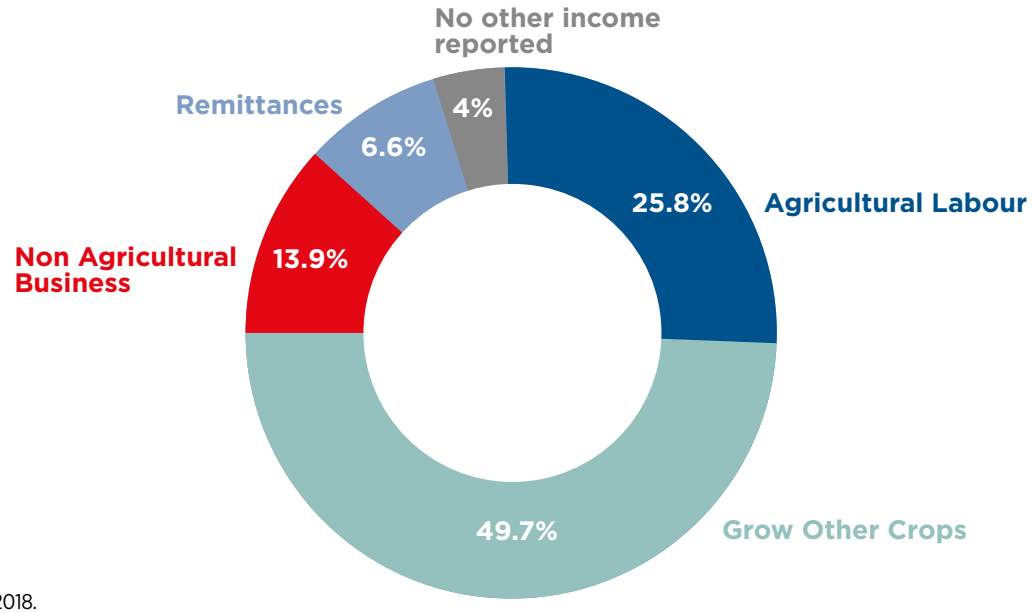
Insight 1. Farming incomes are diverse and shifting

Our research focused on understanding the income and spending patterns of Ghana's smallholder cocoa farmers. Through in-country focus group discussions and interviews, we found that Ghanaian farmers, like most farmers involved in cash crops globally, derive a significant part of their income from agriculture but also rely on other income-generating activities. This helps them mitigate the risks and vulnerabilities that farming can pose.

Amongst the smallholder cocoa farmers that were surveyed, the following breakdown of economic activities represents how they supplement their shifting and diverse incomes.

FIGURE 1

Sources of supplementary income for smallholder cocoa farmers



Source: GSMA 2018.

Insight 2. The economic activities of smallholder farmers are complex, but rarely documented

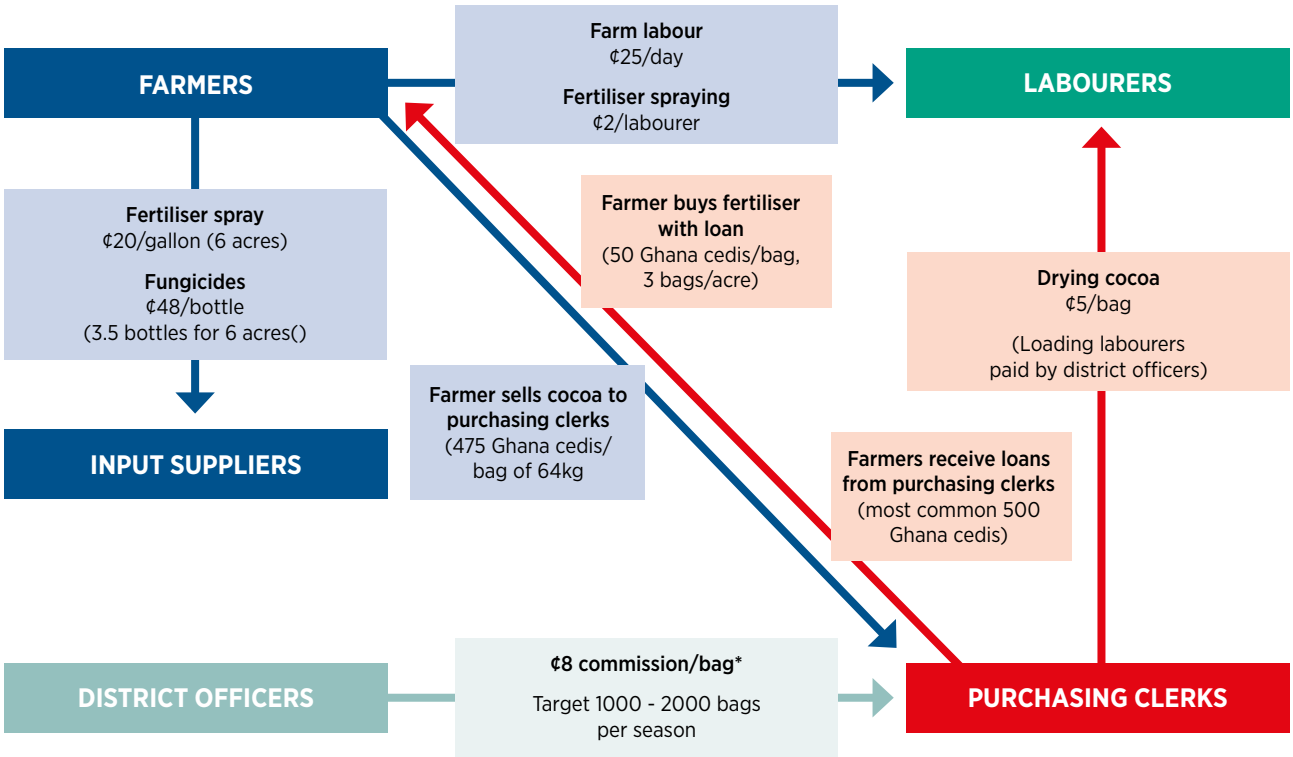
Smallholder farmers are not a homogenous group, and even those farmers with adequate production levels often cannot provide evidence of their economic ability or activity. Without a formal way to document and record their economic activities, farmers cannot demonstrate revenue from sales over a certain period or provide documentation regarding the value of their required inputs or their asset base.

Even when farmers do maintain records, such as physical receipts for the sale of crops to formal agribusinesses or cooperatives, there is often no standardised way of recording and presenting this information to financial institutions, making it difficult to issue credit or insurance. Often this information is in manual records, which are also difficult for formal institutions to process.

Furthermore, the following diagram provides an example of the various financial flows that exist within the cocoa value chain in particular. This demonstrates the wide range of financial transactions that many smallholder cocoa farmers engage in on a regular basis, and highlights the varied financial inputs and outputs which flow between a number of stakeholders within the value chain. The complexity of these flows, coupled with a lack of digitised and/or documented recordkeeping, make it very difficult for farmers to provide an accurate picture of their financial history and health to financial service providers.

FIGURE 2

Example of main financial transaction flows within cocoa value chain



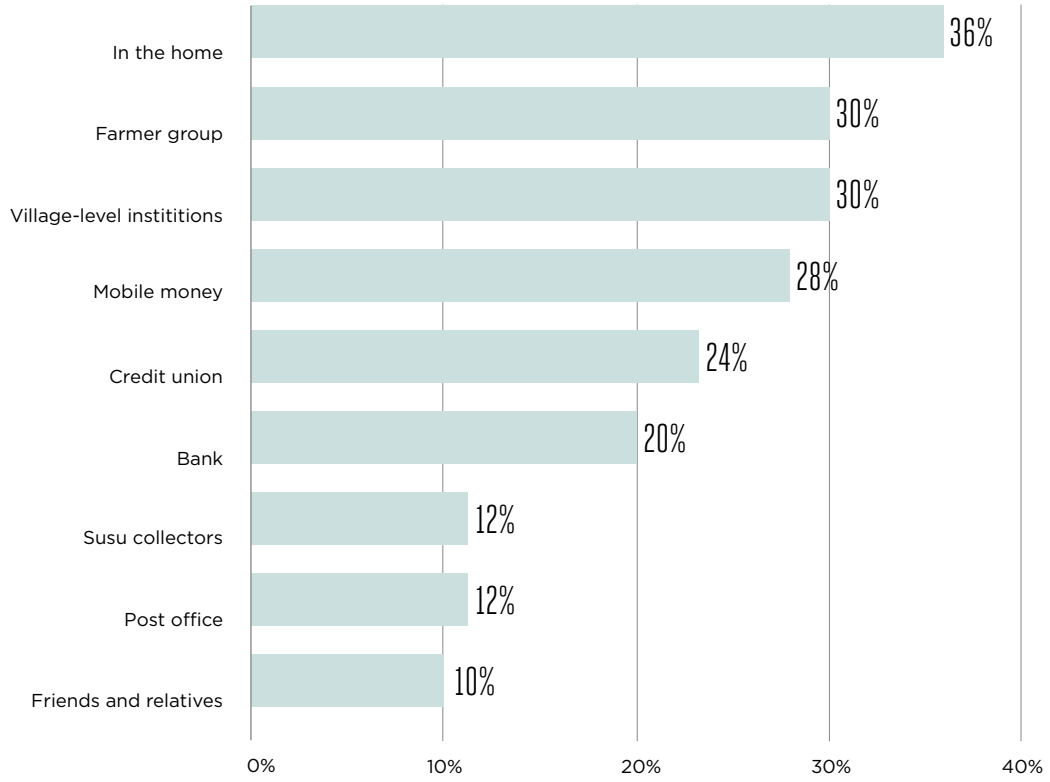
Source: GSMA field research, March 2018.

Insight 3. Farmers tend to save their money at home, primarily to invest in their farming activities and pay their bills

Overall, nearly four in 10 farmers stated that they currently save money at home, with approximately three in ten using mobile money for savings. Therefore, designing products that enable farmers to save efficiently (e.g. target-linked savings products), pay their suppliers, pay their bills (school and utilities) and purchase goods, would provide the best value. When asked what they did with their major sources of income from the seasonal sale of cocoa, smallholder cocoa farmers reported that they use it to purchase farm inputs, pay their children's school fees, pay their utility bills and meet basic needs, such as food, clothing, health, as well as purchase mobile airtime and and contribute to savings.

FIGURE 3

Where smallholder farmers in Ghana save their earnings



Insight 4. Loan appetites amongst smallholder farmers are linked to the seasonality of their income

Our analysis of a typical cocoa farmer's crop cycle and annual calendar showed that their financial needs vary throughout the year (as shown in Figure 4). Therefore, in order to protect themselves against various financial shocks over the course of the year, many farmers require a mix of long and short-term access to financing, in order to supplement their regular (but shifting) income.

This end-user research also revealed a strong borrowing culture in Ghana's cocoa sector. A farmer's primary options for securing a loan include:

- Purchasing clerks (PCs) (who are also usually farmers);
- Banks (often rural banks);
- Money lenders (who sometimes charge up to 100 per cent interest);
- Friends.

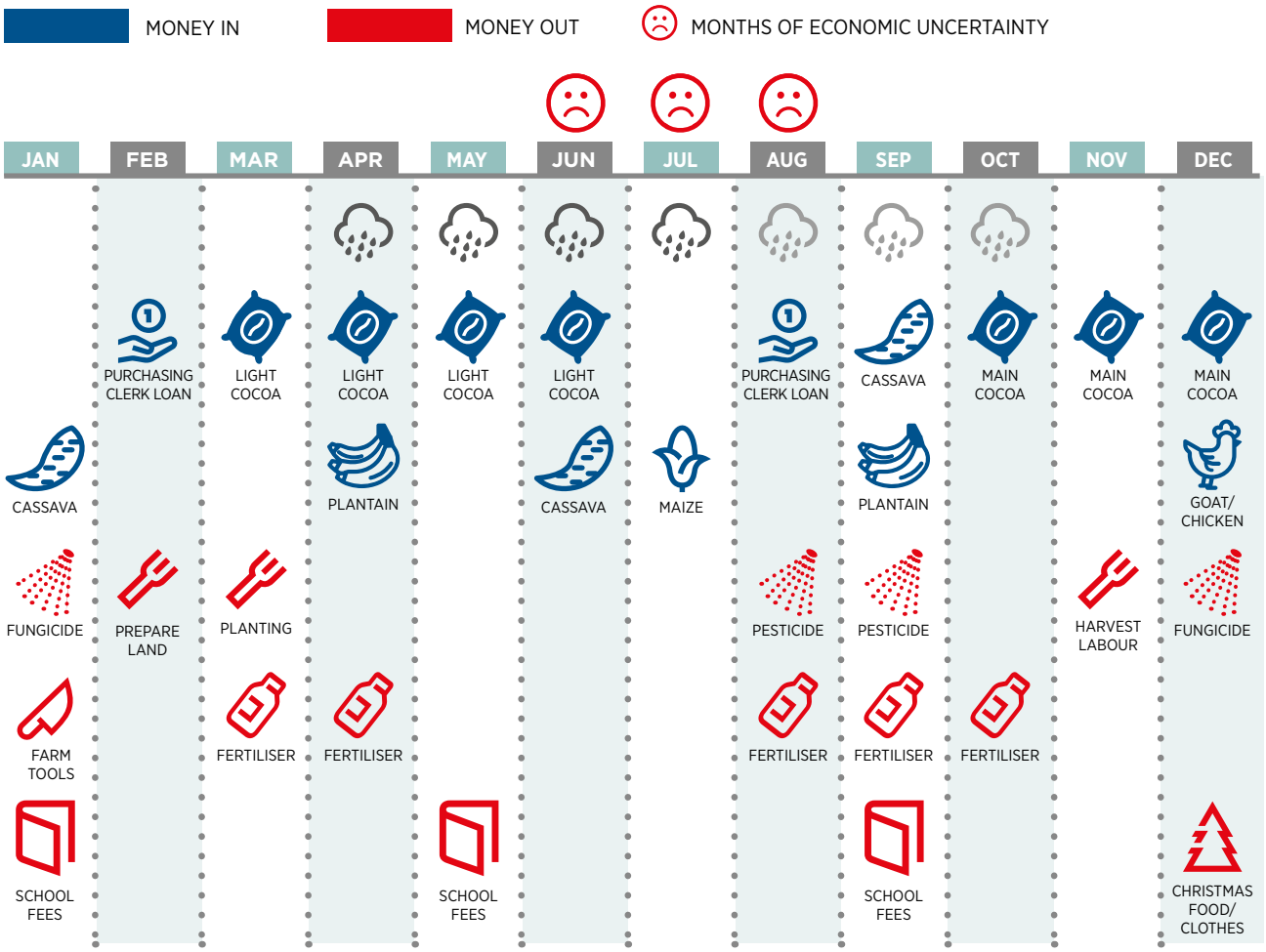
"When you sell during cocoa season, you get a lot of money and saving can ensure you have money for June, July and August when there is less."

Cocoa farmer, Ashanti Region. GSMA interview, 2018

Photography credit: 17 Triggers/C.Zanzanaini

FIGURE 4

Annual crop calendar: cocoa farming

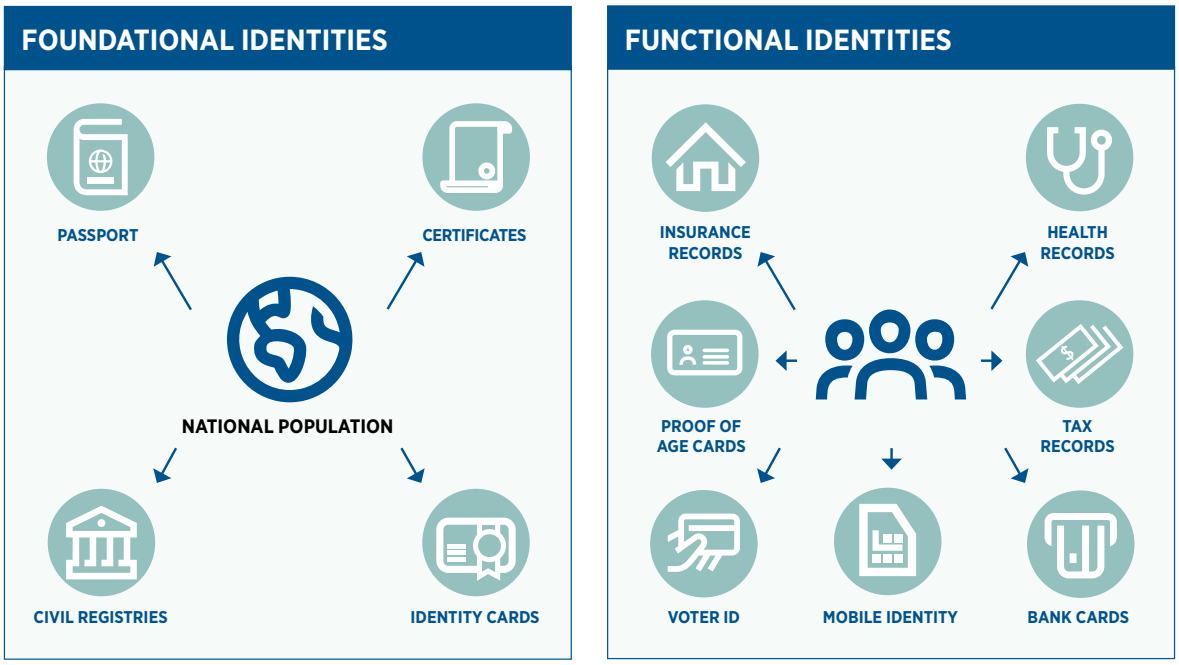


Photography credit: 17 Triggers/C.Zanzanaini

2. Identity and smallholder farmers in Ghana

Overview: Foundational versus functional identities

The World Bank estimates that one billion people worldwide do not have an official form of identification.[16] The ability to prove that you are who you say you are is vital to social, political and economic inclusion, and enables greater access to basic services, such as healthcare and education. As technology advances, governments, NGOs and other stakeholders are exploring new digital solutions to narrow the identity gap. While it is important to remember that identities can take various forms, they can generally be categorised into two types: foundational and functional identities.



Foundational identities[17] tend to be universally available and used for a variety of purposes. Foundational documents are often provided by governments for citizens to prove their identity, such as an identity card, passport or birth certificate.

In contrast, functional identities[18] tend to be created with a specific purpose in mind and are provided by a variety of entities. These types of documents could include a voter card, health record or bank card. Functional identities differ from foundational identities in that both government and non-government players (such as NGOs and private organisations) can offer them.

Given these definitions, an "economic identity" would therefore be considered a form of functional identity, as its purpose is to enable access to a specific set of services (such as access to credit, insurance and savings products).

16. World Bank Global Dataset. World Bank, 2018. http://id4d.worldbank.org/global-dataset
17. For a definition of foundational identities, see: https://www.gsma.com/mobilefordevelopment/programme/digital-identity/digital- I foundational-identities-using-mobile-technology/
18. For a definition of functional identities, see: https://www.gsma.com/mobilefordevelopment/programme/digital-identity/using-mobile-technology-provide-functional-identities/

Ghana's identity landscape

In Ghana, six identity documents (a mix of foundational and functional) are formally recognised: passport, National Health Insurance Card (NHIS), driving licence, voter ID card, birth certificate and the national ID (known as the "Ghana Card"). None of these IDs have scaled to become widely accepted. Most identity documents are functional and issued by certain institutions to offer specific services (See Appendix).

In May 2018, the National Identity Authority of Ghana (NIA) began a mass registration exercise for the Ghana Card programme, which is expected to be the primary identity card for authentication across a range of services. Through the Ghana Card, NIA will create a national identity system that authenticates individuals and captures secure digital and demographic data. The NIA's goal in issuing the card is to provide an integrated and multipurpose identity system that cuts across all sectors. However, roll-out has been somewhat slower than expected and the Ghana Card has yet to scale to the entire population. Since it launched in 2017, 108,286 residents have been registered and 98,892 ID cards have been issued.[19]

The NIA maintains that the Ghana Card programme will provide multiple benefits to citizens, including potentially linking with national health services, reducing barriers to acquiring other identity documents, and improving access to social services and financial services, e-commerce and payments and account registrations.[20] However, until the Ghana Card reaches scale, birth certificates, passports, driving licences, voter IDs and NHIS cards will continue to serve both foundational and functional identity roles, depending on the services needed.

19. National Identification Authority, 2018. https://www.nia.gov.gh/
20. "Everything You Need to Know About the Ghana Card." Website Ghana, 2017. https://websiteghana.com/ghana-card/

Challenge 1

Varying degrees of identity document acceptance across numerous types of foundational and functional identities

The range and variety of different foundational and functional identities in Ghana means that different stakeholders accept different forms of identity in order to access their services, which can be a complex system to navigate. There are six different formally-recognised types of identity documents that are accepted by a variety of institutions (see Table 1) to verify one's identity and authenticate transactions. Many of these documents bear the same common features: name, gender, date of birth, photo and, in some cases, biometric information, which can be useful in establishing one's unique identity. In many cases, however, more than one document is required to identify oneself completely.

Without a universally-accepted identity document, farmers must cope with the additional cost, time and effort it takes to apply for services that require more than one form of identity or additional relevant information.

Our research showed that of the six formally recognised identity documents, the most commonly owned by smallholder farmers in rural areas were voters' ID (95 per cent), NHIS card (42 per cent) and driving license (one per cent). As it can be seen from Table 1, out of the three commonly-owned IDs, commercial banks only accept voter's ID as a prerequisite for opening a bank account and accessing services such as credit and savings. Commercial banks do not accept the NHIS card, which is the second-most used form of identity by rural smallholder farmers who that took part in this research. This can limit a smallholder farmer's options for loans to lenders who offer higher interest rates, such as rural banks and informal lenders.

TABLE 1

Common identity documents accepted by various stakeholders within Ghana's agricultural value chain to access basic services[21]

STAKEHOLDER	COMMON KYC DOCUMENT						SERVICES OFFERED
	GHANA CARD	VOTER ID	DRVING LICENCE	PASSPORT	NHIS CARD	MENBERSHIP ID	
• Commercial banks	✓	✓	✓	✓			• Savings • Credit
• Rural banks	✓	✓	✓	✓	✓		• Savings • Credit
• Insurance		✓	✓	✓			• Crop, animal and life insurance • Disaster insurance
• Mobile network operators and mobile money operators	✓	✓	✓	✓	✓		• Cash-in/cash-out • Payments and transfers • Information services • Credit and savings • Life insurance
• Input credit provider						✓	• Inputs • Cash loans
• Faith-based organisations						✓	• Market access • Credit access
• Agribusiness/major buyers						✓	• Market access

21. A mix of foundational and functional identities are used by different institutions. In the case of birth certificates, these can also be accepted as an official form of identity, but GSMA research shows that they are not commonly used or requested by financial services providers or those in the wider agricultural sector because very few people carry their birth certificate on them. Birth certificates are therefore primarily used to access other forms of identity (such as a Ghana Card), not as a primary document for financial service KYC processes.

Challenge 2

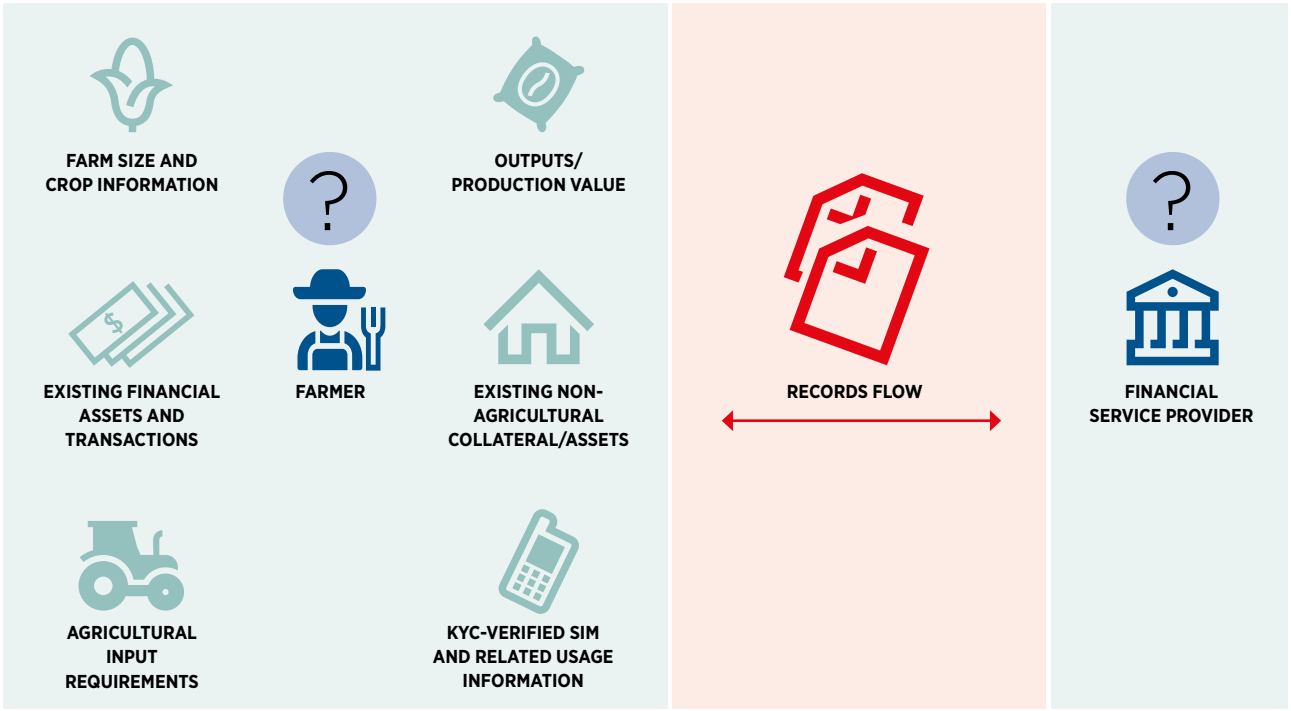
Farmers are willing to share their information in order to get the services they need, but there can be information gaps

Smallholder farmers engage with multiple actors at each stage of the cocoa value chain, and the information and data on their economic activities is captured and stored manually and in silos (see Figure 5). Subsequently, no single entity has a full overview of the financial activities or economic circumstances of these smallhollder farmers. This is one of a few factors that can lead to a smallholder farmer often being perceived as a higher-risk client by formal and informal lenders.[22]

This perception subsequently means that many smallholder farmers in Ghana struggle to access or receive affordable formal financial services. For example, on average throughout February 2018, banks and non-bank financial institutions charged interest to customers in the agricultural sector at a rate of 29.7 per cent, which was 11.7 per cent higher than the central bank's policy rate and 5.2 per cent higher than the average base rate.[23]

FIGURE 5

Illustration of different smallholder data silos (often collected manually) creating an incomplete economic profile



22. Other reasons that contribute to formal lenders often avoiding financing agriculture include "high cost of service delivery...lack of branch networks, perceptions of low profitability in agriculture, lack of collateral, high levels of rural poverty, or low levels of farmer education and financial literacy." Wenner, Mark D., 2010. "Credit risk management in financing agriculture," 2020 vision briefs 18(10), International Food Policy Research Institute (IFPRI). https://ideas.repec.org/p/fpr/2020br/18(10).html
23. Banks APRs and AIs on Deposits as at 28th February 2018. Bank of Ghana, 2018. https://www.bog.gov.gh/public-notices/3467-banks-aprs-and-ais-on-deposits-as-at-28th-february-2018

Photography credit: Farmerline

Insight 5. A complex lending environment for smallholder farmers is not meeting their specific needs and is creating unfavourable financial alternatives

Crucially, as outlined in the previous section, farmers need a mix of short and long-term lending, both to cover against emergencies and in order to invest in their farming activities. Short-term emergency loans are generally only available at high interest rates (sometimes as high as 35 per cent per annum),[24] and a lack of collateral and documentation, combined with a low appetite for risk among financial service providers, can also shut off access to long-term loans. In addition, there is a need to tailor credit products to the needs of farmers, taking into account their cash inflows and outflows, which are dependent on the seasonality of their crops.

Other barriers to credit include requirements like loan guarantees (from village-level institutions, family, friends or relatives) and endorsement letters (from public officials, employers, agribusinesses, and pensioner or farmers' associations), which create a tedious and lengthy process that can take weeks or months from the time of application to approval and remittance. If a loan is required for planting inputs (such as seeds or farming equipment) but does not go through until harvest, farmers may no longer need the money.

It is not uncommon for parallel lending networks to form in rural areas to fill the gaps created by formal lenders. These networks often offer more flexible onboarding terms, but may also charge higher interest rates. The value proposition they offer farmers, including personal engagement and assistance with basic financial literacy concepts, such as savings, lending, or how to operate a bank account and use mobile money, can make them more attractive.

24. AGRA Ghana Operational Plan. AGRA, 2017. https://agra.org/wp-content/uploads/2018/01/AGRA-Ghana-Operational-Plans-_03.11.2017.pdf

Ultimately, these challenges translate into a reduction of financing for Ghana's agricultural sector – only an estimated of four per cent of formal bank lending goes to the agriculture sector, despite it contributing approximately 19.7 per cent of GDP.[25] This has a number of impacts on smallholder farmers and the agriculture sector in Ghana. One effect of low or reduced lending to smallholder farmers is that, despite understanding the importance of using high-quality inputs, many farmers cannot afford to purchase them and instead rely on inputs that generate smaller and lower quality yields. With less income, a farmer is less likely to invest in high-value inputs the following crop season, thus perpetuating the poverty cycle (see Figure 6).

There is evidence that access to information on farming practices, and more generally agro-climatic advisory services, can improve productivity and income for farmers.[26] For example, research from the GSMA research shows that "power users" of agricultural value-added services in Pakistan were 1.9 times more likely to report an increase in income than non-users, while "power users" in Malawi were 3.6 times more likely to report an increase in production than non-users.[27] Access to financing should also, over time, enable increased income through improved productivity as well as better quality of crops, resulting from the use of better inputs.
In turn, these factors can enable a farmer to repay credit and still have enough to feed their families, thus reversing the cycle of diminishing productivity (see Figure 7).

The challenges mentioned in this section highlight the number of variables that can impact a smallholder farmer's ability to access both information services that can improve productivity levels, and also financial services such insurance, credit and savings products. These factors put smallholder farmers in an acutely vulnerable position in terms of the financial shocks they are exposed to, which has serious short and long-term consequences.

> *"Agricultural lending in Ghana has fallen from 16 per cent in 1990 and is currently four per cent"*
>
> *Bank of Ghana*

FIGURE 6

Impact of low or reduced lending to smallholder farmers

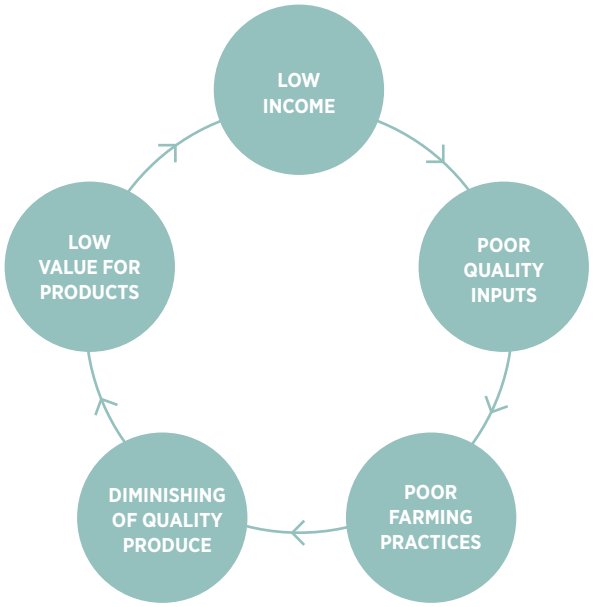
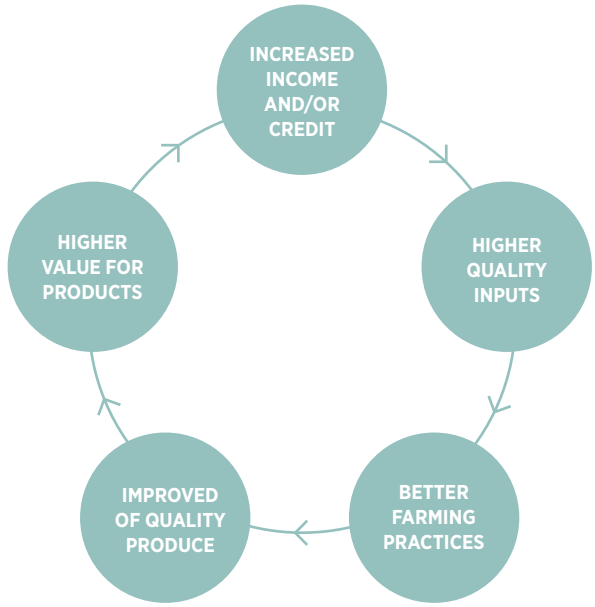


FIGURE 7

Impact of access to financing and training in farming practices



25. World Bank and OECD Data Set. World Bank, 2017. https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS
26. Improving the Productivity of Smallholder Coffee Farms in Kenya. IFC, 2014. https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/improving_productivity_smallholder_coffee_farms_kenya
27. Creating Scalable Mobile Solutions. GSMA, 2017. https://www.gsma.com/mobilefordevelopment/magri/creating-scalable-mobile-solutions/

3. Prerequisites for developing an economic identity

Economic identities have the potential to help farmers build pride in their profession, feel more informed, connect to new markets or buyers, access digital financial services and reduce their financial vulnerabilities. In the long-term, this will help lead to improved farming practices, increased digital and financial inclusion, and higher productivity. Insights from interviews with key stakeholders within Ghana's agricultural sector suggested that building an economic identity relies on two main pillars explained in this section.

Pillar 1. The development of economic identities requires both foundational and functional inputs, supported by digitising agricultural value chains

To develop an economic identity that is widely accepted, both functional and foundational data must be leveraged in conjunction with data and information from multiple sources in the agricultural value chains (AVC). This creates a holistic economic profile of a smallholder farmer and, in theory, should unlock access to financial services like credit, savings and insurance.

When applying for different financial services, smallholder farmers are often asked to provide proof of income, assets and economic history (e.g. with certified documents like land titles; proof of home, vehicle and machinery ownership; and crop yield records). Absence of a digital track record for this information alongside the use of cash payments hinders a smallholder farmer's ability to provide a full picture of their economic activities.

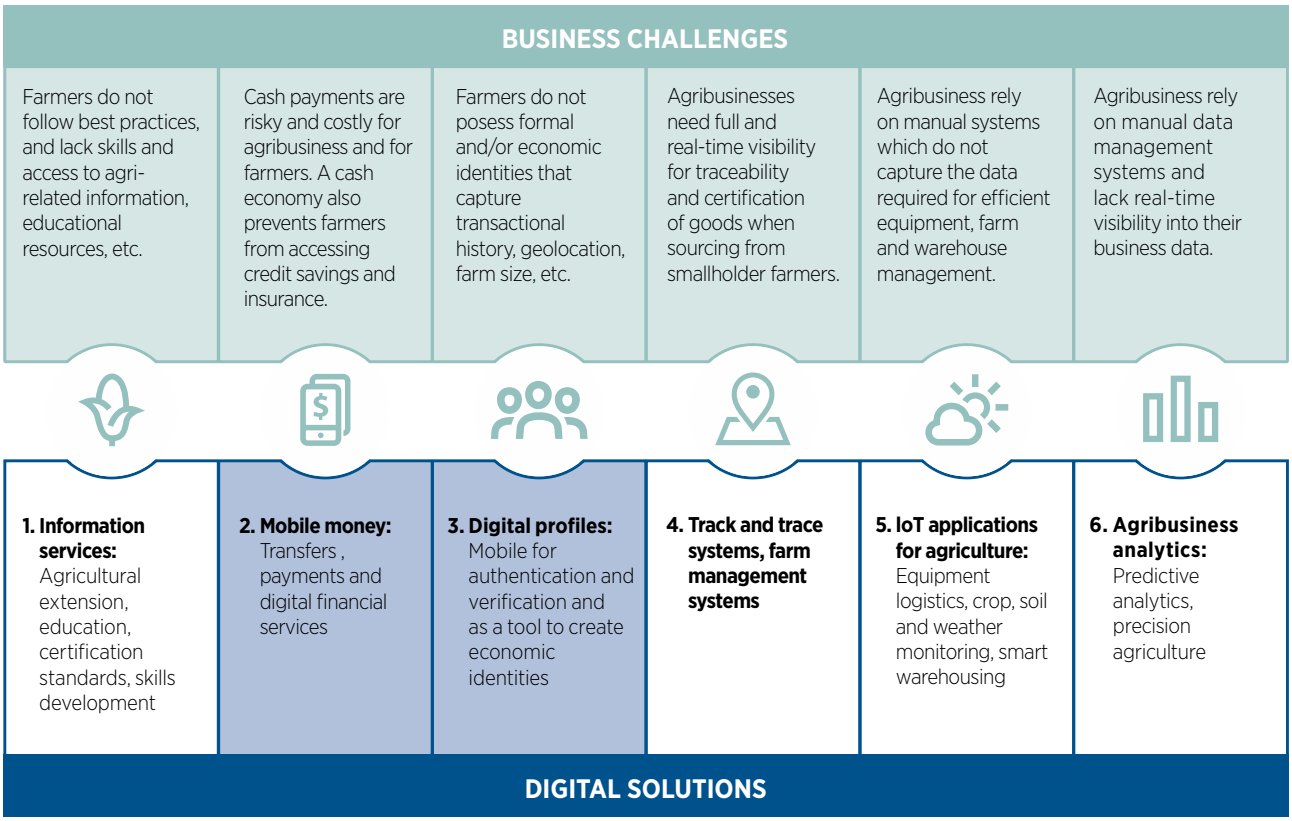
When famers are engaged in formal value chains (as is the case for cocoa farmers in Ghana) there is an opportunity to leverage formal value chain relationships between farmers and organisations procuring crops from them (i.e. cooperatives, agribusinesses) to deploy digital tools and create economic identities. This is one of the reasons behind the importance of last mile digitisation for the agriculture sector.[28] Digitising business-to-person payments for the procurement of crops and creating digital farmer profiles, are key initiatives to support the creation of an economic identity for farmers engaged in formal value chains (See Figure 8).

There are a number of inefficiencies in agricultural value chains such as theft and fraud, the time and travel required to receive cash payments for crops, and an overall lack of visibility for buyers and sellers. However, a range of digital tools can help to improve business performance for farmers and agribusinesses and eventually lead to financial inclusion for farmers.[29]

28. Digitising agricultural value chains through mobile-enabled tools in the so called "last mile"- defined as the web of relationships and transactions between crop buyers and farmers who produce and sell their crops. In the last mile, global markets connect with rural economies before the processes of transformation and value addition take place.
29. *Opportunities in agricultural value chain digitisation: Learnings from Uganda*. GSMA, 2018. https://www.gsma.com/mobilefordevelopment/programme/magri/opportunities-in-agricultural-value-chain-digitisation-learnings-from-uganda

FIGURE 8

Digital tools can address the pain points of farmers and agribusinesses in the last mile[30]



Pillar 2. Building an economic identity requires efficient data management processes

Stakeholders that engage with smallholder farmers rely on various forms of identity documents to on-board farmers and provide them with services [see Appendix]. For most institutions, there is a KYC requirement to positively identify individuals from the beginning.

Once this relationship is established, the same identity documents are used to verify and authenticate the owner in subsequent interactions and/or transactions. Some stakeholders collect additional details about the farmer that are directly related to the types of services they want to offer. They are typically interested in specific attributes that uniquely define the person and their activities, as shown in Table 2.

> *"We collect demographics information like gender, age, occupation, location, family size and crops being cultivated. We use national IDs for verification of identity and also repayment, which they are able to track through the mobile money system since all payment is done via mobile money... this is used to build a credit history on the customer."*
>
> *PEG Ghana, pay-as-you-go (PAYG) solar provider*

30. *Prerequisites to digitising the agricultural last mile*. GSMA, 2018. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/07/mAgri-Toolkit-2018-Prerequsities-to-digitising-the-agricultural-last-mile.pdf

TABLE 2

Examples of data attributes of different actors that engage with smallholder farmers

IDENTIFICATION INFORMATION	DESCRIPTIVE INFORMATION	TRANSACTIONAL INFORMATION
• Name • Biometrics • Age • Gender • Photo • Phone number • Next of kin • Residential address • Location • Account number • Farmer association membership	• Farm size under cultivation (may be seasonal) • Annual income • Building type • Collateral for credit • Farm machinery • Investments • Previous farm records • Number of inputs purchased • Type of crop or animals • Other activities (agricultural/ non-agricultural) • Income/income sources	• Call data records • Mobile money transaction history • Loan repayment history • Production/sales history • Agricultural yields • Bills paid electronically • Inputs purchased

Although there are a large number of stakeholders who interact with and collect data from smallholder farmers in Ghana, very few are able to use this information to provide an accurate and holistic economic appraisal of the farmers they work with. This is because smallholder farmers regularly engage with multiple actors across the agricultural sector and their data is captured and stored in various places.

Some stakeholders noted that although they collectively handled a wide variety and volume of data, there were several shortcomings with data collection, storage and management. The creation and widespread use of economic identities, which rely on multiple data points from a diverse range of stakeholders active in Ghana's rural regions, may, over time, improve the accuracy of certain data inputs and as a driver for improved data management processes.

FIGURE 9

Data attributes collected by actors within the smallholder cocoa value chain

KEY ATTRIBUTES (DEMAND)	STAKEHOLDERS							
	COMMERCIAL BANKS	RURAL BANKS	INSURANCE	MNO	MOBILE MONEY OPERATORS	INPUT CREDIT PROVIDER	FBOS	MAJOR BUTERS (LBC)
Date of birth data	✓	✓	✓		✓	✓		
Photo	✓	✓						
Next of kin	✓	✓				✓		
Phone number	✓	✓				✓	✓	✓
Residential address	✓	✓				✓		✓
Name				✓	✓			✓
Name of parents	✓	✓						
Types of buildings (permanent or semi-permanent)	✓	✓						
Farm size			✓					
Location			✓	✓				
Type of crop or animal			✓				✓	✓
Acreage for cultivation						✓	✓	✓
Activities other than farming	✓							
Moisture content in cocao								✓
Collaterals	✓	✓						
Machinery	✓							
Investments	✓							
Account number								
Annual income								
Previous farm records			✓					
Transaction history				✓	✓			
Repayment history								
Membership eligability dates						✓		
Amount of inputs to be purchased								
Production and sales history								✓
CDR				✓				

Photography credit: Farmerline

4. Key considerations and sample framework

Why are mobile operators well-placed to provide economic identity services?

MNOs are well positioned to champion the development of reliable economic identity services in Ghana, beginning with smallholder farmers. These identities enable farmers to document and present various economic activities and behaviours digitally. For example, the ability to demonstrate income generated over time, or the value of inputs used in a given season, could make it easier for financial services providers (such as insurance companies) to assess the value of insured assets and the frequency of premium deductions in line with agricultural income. Financial institutions could also use a farmer's economic identity to assess their economic health and ability to repay loans and generate a reasonable risk profile. Questions remain regarding which stakeholders are best placed to aggregate this data, the varying degrees of incentivisation that stakeholders have to share this data, and the extent to which a farmer would have control over how their data flows and is stored. These operational and regulatory considerations would require further exploration and clarification ahead of developing and implementing an economic identity solution, but were outside the scope of this piece of research.

Mobile operators considering entering this space should consider the following insights gleaned from our research:

1 **MNOs already implement sufficient safeguards for mobile ownership and use, which makes them well-placed to drive adoption of digital identity services such as economic identities:** Mobile ownership, access and use rely on foundational and functional identities issued by the government and mandated by the Bank of Ghana. All MNOs must adhere to these requirements to meet KYC and anti-money laundering/combating the financing of terrorism (AML/CFT) requirements. In Ghana, operators offer tiered levels of services depending on the strength of the identity document provided by the customer during registration. The more basic the document, the fewer services the customer can enjoy.[31] Since these safeguards are already in place, mobile ownership can provide a foundation for digital identity. A mobile account can also be considered a unique secondary reference point for a user's identity

31. *Overcoming the Know Your Customer Hurdle: Innovative Solutions for the Mobile Money Sector*. GSMA, 2019. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/01/Overcoming-the-KYC-hurdle-Innovative-solutions-for-the-mobile-money-sector.pdf

and can be used to provide fast and secure authentication.

2 **MNOs possess rich data on customers, based on mobile and financial usage:** The use of mobile-based services, such as mobile money, voice calls, SMS and internet, provides rich behavioural data. The unique attributes based on usage patterns can give an MNO a better understanding of its customers. When smallholder farmers use their devices to access these services, the interactions and transactions build up to create a full economic history that can be leveraged to build a base for creating a digital identity, in this case an economic identity.

3 **MNOs have a unique ability to distribute information and payments digitally to smallholder farmers in rural areas:** Through rural connectivity, mobile devices create ubiquitous links between rural communities and build relationships that strengthen social interactions in remote areas. This empowers smallholder farmers to share information, both with each other and with stakeholders in the agricultural sector. MNOs have also demonstrated their ability to use mobile-based information services to provide useful information to farmers that can enhance their farming practices and increase yields. There is still no better way to reach people in remote areas with financial services than through the growing network of mobile money agents. Agents provide a local and physical connection to a national digital service, responsible for educating new customers, upholding regulatory standards, and interfacing with the cash economy. In 2018, there were more than 6.6 million registered agent outlets globally, of which 3.7 million were active on a monthly basis. These agents extend the reach of mobile money services to rural areas.[32] In fact, over 50 per cent of survey participants in GSMA's Mobile Money Global Adoption Survey reported having a product specifically targeted to rural customers or plan to launch one in 2019.[33] One concern to highlight is that not all smallholder farmers are literate, and may give their phones to an agent to perform transactions, which can increase the likelihood of fraud. However, there are technical solutions such as biometric registration and Interactive Voice Response (IVR) that an MNO can integrate into their mobile money platform. These solutions enable illiterate customers to use mobile money services, should be explored if economic identity solutions are targeting a demographic where illiteracy may be a usage barrier.[34]

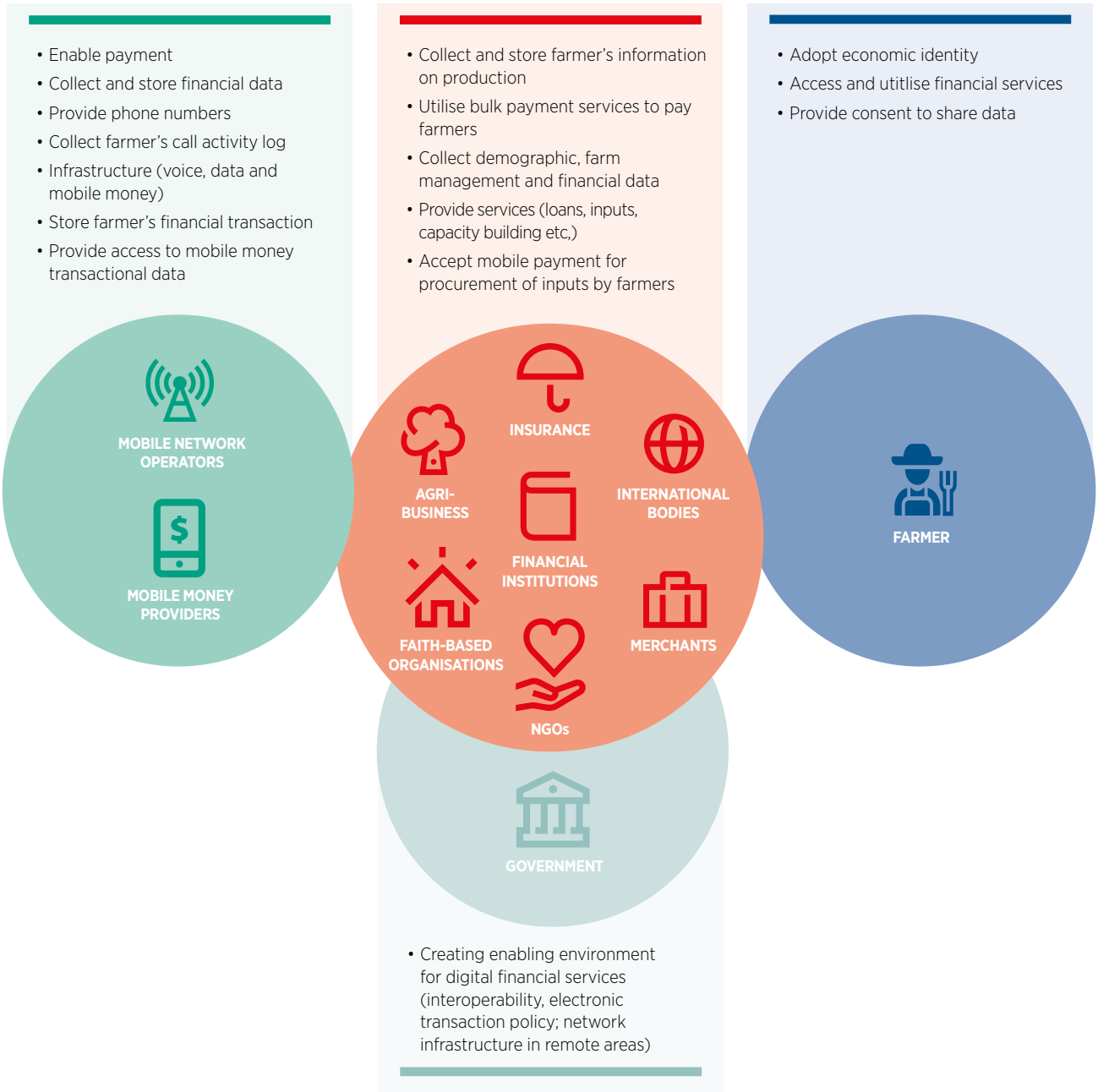
4 **MNOs have strong partnerships with enterprises and financial services providers that they can leverage to deliver social benefits to smallholder farmers:** Through these partnerships, they can offer services such as data collection, customer on-boarding and education, collection and distribution of payments. In return, they can leverage their partner's field agents to ensure liquidity management. They can also partner with banks, insurance providers and microfinance institutions (MFIs) to offer customised consumer and enterprise financial products that address farmers' needs without exploiting them.

MNOs in developing countries are well-positioned to offer smallholder farmers the services and information they need and to address the economic challenges they face. For example, in Kenya, Safaricom has piloted a service called DigiFarm, a solution it developed to offer mobile money payments, e-commerce and enterprise solutions to those working in Kenya's agricultural sector.[35] An additional 20,000 smallholder farmers actively used DigiFarm during the pilot, which gave them access to "a suite of information and financial services, including discounted products, customised information on farming best practices, and access to credit and other financial facilities".[36] Figure 9 illustrates an overview of different data attributes collected by different stakeholders who engage with smallholder cocoa farmers in Ghana.

32. *State of the Industry Report on Mobile Money*. GSMA, 2019.
33. Ibid.
34. *Overcoming the Know Your Customer Hurdle: Innovative Solutions for the Mobile Money Sector*. GSMA, 2019. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/01/Overcoming-the-KYC-hurdle-Innovative-solutions-for-the-mobile-money-sector.pdf
35. Safaricom Annual Report, 2018. Safaricom PLC, 2018. https://www.safaricom.co.ke/annualreport_2018/annual_report.pdf
36. Safaricom 2018 Sustainability Report. Safaricom PLC, 2018. https://www.safaricom.co.ke/sustainabilityreport_2017/innovation/digifarm-and-connected-farmer/

FIGURE 10

Partnership potential via MNO relationships in the agricultural sector



What does a sample mobile-enabled economic identity look like?

Based on our end user and stakeholder research, the following framework provides an example of what a mobile-enabled economic identity service could look like for smallholder farmers in Ghana. Figure 11 summarises the types of assessments that could be made about a farmer whose complete profile is visible to a group of selected stakeholders. This framework assumes that all risks associated with data privacy and security have been mitigated, and that contractual agreements and appropriate business models are in place for stakeholders and MNOs.

FIGURE 11

A sample framework for building an economic identity for a smallholder cocoa farmer

	INSTITUTIONS				
	MNOs	**FSPs**	**INSURANCE**	**AGRIBUSINESS**	**BILLERS/ MERCHANTS**
Foundational and Functional ID	Application form + passport, driving licence, voter ID, birth certificate, Ghana Card				
Assigned ID	MSISDN	Bank Account Number	Policy Number	Passbook	Account Number
Transaction/ information generated	• CDR (voice, SMS, data, location) • Mobile money transactions (CICO, transfers, remittances, payments, airtime) • Phone type	• No. of accounts • Type of account • CR/DB card held • Transactions (deposits and withdrawals, loans and savings history, remittances and bank transfer, payments)	• Insurance type (plant/animal, business) • Policy duration • Beneficiaries • Claim history • Premiums paid	• Input (types, cost, quantity) • Produce brought to collection point • Annual yield • Quality of yield • Cash paid for produce collected • Training/extension needs	• Usage (e.g. electricity/ water consumed, goods purchased, school fees and hospital bills)

OUTPUT: WHAT THE COMBINED DATA SAYS

Kojo, 48, has owned a mobile phone for five years. He has an Infinix smartphone that he bought using money his eldest son sent from the United States eight months ago to communicate over WhatsApp. His average annual spend on airtime is $200 and his mobile money turnover in 2017 was $3,000. Kojo is repaying a five-year loan of $1,800 from a rural bank to expand his land, build a stone house and install electricity on his farm. He has an arrangement with his bank to make regular payments through income from growing cocoa supplemented with income from plantain. Yields have been good over the last two years since he received training in improving crop quality from the Ministry of Agriculture. He has purchased insurance once, in 2016, but stopped because he does not understand it. He has two daughters in primary school and one son in secondary school, and pays their school fees in small instalments. His family visited the local health centre five times this year. He aspires to buy an irrigation system in order to grow vegetables and plans to begin poultry farming in two years.

DECISION

What can an MNO offer Kojo?

1. Airtime and data bundles
2. International remittances through mobile money
3. Merchant payment discounts on mobile money
4. Bonus payments through an agribusiness for increased farm yields
5. Link him to buyers for poultry and vegetables
6. Mobile money payments for school fees
7. Access to credit, savings and insurance services via financial service providers and other partners

Photography credit: Farmerline

5. Conclusion

Although it is clear that MNOs can participate in the data-sharing ecosystem and unleash the potential of combining data sources, this will require a partnership-based model that adheres to the industry's strictest data protection and privacy standards. In accordance with GSMA's Mobile Privacy Principles[37] and GSMA's Guidelines on Mobile Money Data Protection, MNOs must ensure that data is "handled in a safe and responsible manner [building] the technical and compliance capabilities of the core GSM business to advance data protection in mobile money."[38] Through partnerships with agri-businesses, financial services providers, crop-specific certification bodies, input dealers, government entities, farmers' associations, insurance providers, NGOs and others, MNOs can build digital information on smallholder farmers to supplement existing call and financial usage data. This will help shape a mobile-enabled economic identity service can be built leveraging in-house capabilities and existing enterprise relationships to provide a single view of a user's economic history and behaviour.

The three main benefits of launching an economic identity platform (for Ghanaian MNOs) are as follows:

- Enhance and personalise product and service offerings based on specific customer needs
- Reach a new demographic and engage with existing smallholder farmer customers more effectively
- Diversify their revenue sources

Through our research, we learned that stakeholders in Ghana's cocoa value chain need to act urgently to close the identity gaps preventing smallholder farmers from accessing financial and other services. In-depth field research which aimed to understand the relationship between identity and financial inclusion amongst this demographic enabled us to paint a clear picture of why various stakeholders believe that MNOs are in the best placed to help define these identities. We also demonstrated how MNOs can leverage their own data and partnerships in the ecosystem to combine and expand data sources to create universally accepted digital economic identities.

Photography credit: 17 Triggers/C.Zanzanaini

37. GSMA Mobile Privacy Principles. GSMA, 2016. https://www.gsma.com/publicpolicy/wp-content/uploads/2016/02/GSMA2016_Guidelines_Mobile_Privacy_Principles.pdf
38. Guidelines on Mobile Money Data Protection. GSMA, 2018. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/09/GSMA-Guidelines-on-mobile-money-data-protection.pdf

Appendix

Identity documents in Ghana

Type of ID system	Document	Key attributes / indicators	Issuer	Function/Services
Foundational	Birth certificate	Name, gender, date of birth, location, parents' names, occupation, birth ID number	Births and Deaths Registry*	• Proof of identity • Acquire voter ID, Ghana Card, Passport
	Ghana Card	Name, gender, date of birth, photo, height, personal ID number, chipset, expiration date	National Identification Authority (NIA)	• Proof of identity • Financial and other service authentication
Functional	Voter ID	Name, photo, gender, age, voter number, barcode, date of registration	Electoral Commission	• Proof of: - Identity - Eligibility to vote • Authentication
	Passport	Name, date of birth, place of birth, gender, passport number, date of issue, expiration and place, photo, digital signature, nationality, barcode	Ministry of Foreign Affairs and Regional Integration	• Proof of: - Identity/citizenship - Eligibility to travel across boarders • Authentication
	Driving licence	Name, date of birth, photo, driving licence number, date of issue and expiration, digital signature	Driver and Vehicle Licensing Authority	• Proof of: - Identity - Eligibility to drive • Authentication
Others	Health Insurance (NHIS) Card	Name, gender, date of birth, photo, membership number, date of issue and expiration	National Health Insurance Authority (NHIA)	• Proof of: - Identity - Eligibility to receive healthcare services
	Pass book	Name, pass book number, photo, location, gender, age, transaction information	Government and Private Sector (e.g. rural lenders, NGOs, savings groups)	• Proof of: - Ownership of a farm - Eligibility to supply farm produce to buyers

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