



Digital Financial Services for Agricultural Value Chains

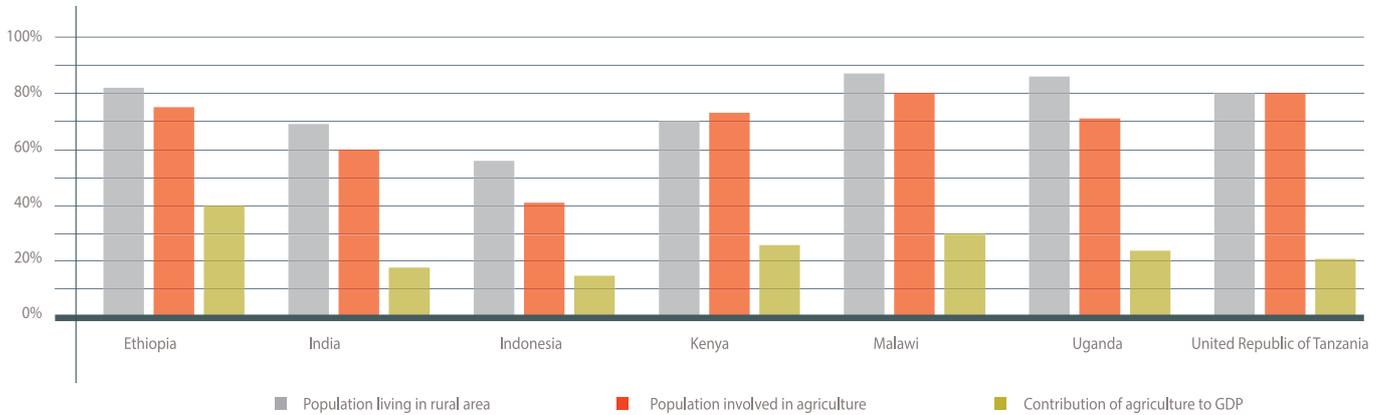
An integration guide for rural areas

By Isaac Holly Ogwal and David Lubwama Mugabi of *MicroSave*

Digital financial service (DFS) providers across Africa and Asia typically build their DFS deployments from major urban centres, based on the assumption that these centres have a literate population with sufficient income to benefit from DFS. Another assumption is that the urban population includes early adopters who can influence others, including the rural population, to take up DFS. Theory aside, after relative success in urban centres, many DFS providers are struggling with strategies to extend their reach and to increase adoption and uptake of DFS in rural areas.

In most developing countries, the majority of the population is rural, creating a clear incentive for DFS providers to design appropriate strategies for penetration of their products and services into rural areas. In many countries, including Bangladesh, Ethiopia, India, Kenya, Malawi, Pakistan, Uganda, United Republic of Tanzania and Zambia, more than 70 percent of the total population is rural. A common denominator amongst rural populations is the dominance of agriculture as the source of employment, with more than 70 percent of the population employed in that sector (see figure).

Agriculture vis-à-vis population and GDP, in select countries



Source: <http://data.worldbank.org/>

This focus note argues that agricultural-based transactions can facilitate DFS penetration in rural areas, by digitising transactions around major rural economic activities. This argument is supported by demographics. In Uganda, the coffee industry employs 2.5 million people, tea 200,000 and dairy 1.2 million. The logic is also supported by some empirical evidence. Danielle White's paper 'The Social and Economic Impact of MPESA on the Lives of Women in the Fishing Industry on Lake Victoria'¹ demonstrated that the fish value chain contributed to the growth of M-PESA in the fishing village of Sori in Migori County. Interviews with 117 women revealed the following:

- Ninety-two percent of the women said they process their fish and sell it in surrounding areas, and 77 percent said they keep their earnings separate from their husbands' and spend the money on basic needs, school fees and on their business' growth.
- Sixty-two percent of the women admitted using M-PESA for saving, sending and receiving money, and 71 percent said they had directly benefited from M-PESA. The majority of women who said they did not benefit said so because they did not receive interest on savings, as is the case when they save with formal banks; however, this situation has since changed with the M-Shwari and KCB M-PESA savings and lending products that provide interest on savings.
- More than 50 percent said they saved their money with M-PESA because it enables them to save their money in a safe place and their husbands have no access to their money.

The designers of the United Nations Capital Development Fund (UNCDF) programme Mobile Money for the Poor (MM4P) in Uganda realised the potential impact of agriculture as a gateway for DFS growth and commissioned *MicroSave* to conduct research on three agro-value chains: coffee, dairy and fish. The resulting report, 'DFS Fusion in Agro Value Chain Research,' demonstrated that there were intervention points in each value chain that DFS providers could use to spread their services to rural areas.

Drawing on that research, this focus note offers DFS providers around the globe some key considerations when using agriculture to drive DFS growth.

Why digital financial services for agro-value chains?

DFS facilitate intermediation of small financial transactions such as cash deposits, small loans, remittances and payments (e.g., payments for farm inputs and transfers of funds amongst farmers involved in an agro-value chain). According to the USAID briefing paper 'Using Mobile Money, Mobile Banking to Enhance Agriculture in Africa,'² mobile money offers the following benefits to agro-value chains:

- It can promote increased investment in agro-value chains by providing a cheaper, more efficient, traceable and transparent payment method for high-volume, low-value transactions. This finding is emphasised by the fact that a quicker, safer and more efficient transaction channel allows the value chain, as a whole, to better meet market demand.
- It can facilitate more widespread access to agricultural financial services by reducing the administrative costs to financial institutions yet providing more accessible repayment and savings options for customers.
- It can allow agribusinesses to offer farmers more financial services, such as payments into savings accounts or electronic vouchers for inputs and services.
- The development of a mobile financial services ecosystem can additionally open up business opportunities for buyers, traders, input dealers, service providers and farmers.
- According to the Agricultural Finance Yearbook 2013/2014,³ DFS have significantly expanded access to finance, especially for people living in rural areas, and have the potential to continue expanding access in a lasting and sustainable manner.

Ultimately, DFS providers desire to grow their deployment beyond cash-in/cash-out transactions, but many fail to realise the importance of large cash-in transactions as a medium for growing their DFS ecosystem. The 'DFS Fusion in Agro Value Chain Research' report showed that companies involved in agricultural processing employ 1,000–7,000 employees, who line up on payday to receive cash. The digitisation of these transactions could drive other DFS products, such as airtime top-ups, savings, remittances and merchant transactions.

A tea processing company in Western Uganda goes as far as dropping money from an aircraft onto the tea estate, where the money is then organised and paid to thousands of employees working there. Many companies across different agro-value chains are in a similar dilemma. Yet, the standard bulk payment solutions that DFS providers have currently designed cannot meet the needs of digitising payments in the agricultural sector, which is characterised by many smaller value transactions.



2 Judy Payne and Krish Kumar, 'Using Mobile Money, Mobile Banking to Enhance Agriculture in Africa,' USAID Briefing Papers (December 2010). Available from http://www.ictworks.org/sites/default/files/uploaded_pics/2011/FACET_MobileMoney_FINAL12202010.pdf

3 Published by Uganda's Economic Policy Research Centre

What steps should digital financial service providers take?

1. Conduct research and pilot testing in the value chain

The significance of research has often been overlooked by DFS providers. Yet, part of the M-PESA success story can be attributed to applied research, as David Cracknell shared in his briefing note 'The Safaricom M-PESA Pilot Test.'⁴ He noted that the 18 months of applied research that Safaricom undertook with Faulu Kenya, prior to the launch and commercialisation of M-PESA, provided the core design of M-PESA and tested approaches Safaricom would later use to take M-PESA to scale. Few, if any, DFS deployments have conducted as much in-depth research prior to deployment as Safaricom, and (arguably) none have been as successful.

Research of specific agro-value chains can provide an in-depth understanding of the opportunities for viable digitisation of financial transactions and, therefore, whether to proceed to a pilot test. The factors to be identified in this type of research include the following:

- a. *Actors involved in the value chain.* These actors are those who complete key activities within the value chain, from production to marketing to delivering the end product to consumers. When considering them, it is important to understand the number of people involved at each stage, the role of each actor, and the significance and influence of each actor within the value chain.

For example, in the 'DFS Fusion in Agro Value Chain Research' report, five important actors were identified in the fish value chain: fishers, fish traders/middlemen, local fish processors, retailers and the beach management units who are tasked with overall management of fish landing sites. Of all five actors, the two most influential were found to be the fish traders/middlemen and the local fish processors. These actors make strategic and operational decisions that influence all participants in the fish sector, so their acceptance of DFS becomes critical in digitising the whole chain.

- b. *Seasonality.* Rural economies are heavily influenced by seasonal factors, which can be explored through seasonality analysis.⁵ This type of analysis maps seasonal trends across the value chain, and it notes when seasonal investments occur, when harvests are realised and how harvesting patterns affect the financial behaviour of value chain actors. Financial behavioural patterns to map include changes in income, saving and demand for credit and expenditure throughout a year.

This analysis provides strategic information to inform product development, and the design of service channels to meet the needs of value chain actors. For example, DFS providers that have a savings and credit



4 David Cracknell, 'The Safaricom M-PESA Pilot Test', *MicroSave Briefing Notes*, No. 159 (May 2015). Available from http://www.MicroSave.net/files/pdf/BN_159_Safaricom_M_PESA_Pilot_Test.pdf

5 MicroSave, 'MicroSave's Focus Groups and PRA Tools', PowerPoint presentation distributed on www.ideasnet.org, 31 August 2014. Available from http://www.MicroSave.net/files/pdf/Brief_Intro_to_MR4MF_Tools.pdf

product (e.g., Safaricom M-PESA's M-Shwari and Vodacom M-PESA's M-Pawa) can use this information to guide product features such as fee structures, loan periods and required repayment patterns, and even to inform the repayment process.

- c. *Current form(s) of payments/transactions.* The 'DFS Fusion in Agro Value Chains Research' report revealed that cash remains the dominant payment form; however, the research critically indicated pain points in making or receiving cash payments and established the preferences of value chain actors. In rare instances, mobile money and cheques are being used. Cash is usually preferred as a result of the inefficiencies of other payment methods, plus the need of farmers to have an instantaneously convertible asset to settle immediate needs.

Small, frequent rural transactions are often unable to support a widespread 'brick-and-mortar' banking infrastructure. DFS providers can use the desire for a convenient, convertible, secure, accessible form of payment combined with lower delivery costs to compete with cash. However, developing successful DFS channels requires answers to why cash continues to be the preferred choice for payments as well as understanding of the pain points that DFS can remove.

- d. *Flow of money.* This flow includes the source, routing, destination, reasons and types of payments or transactions. Research tools, such as cash mobility mapping, can be used to map the nature, flow, timing and frequency of transactions, and to understand who is receiving payments and their purpose. This understanding enables DFS providers to identify whether digital payments could be an appropriate channel and, if so, the requirements for making them happen.

Research in the tea value chain in Uganda provided insight into the monthly value and nature of payments companies made and to whom payments were being channelled. It identified that many casual workers are migrants who travel over 200 kilometres to work in tea estates and factories, with some migrants coming from as far away as Rwanda. These migrants remit money to their families, typically by sending funds through friends or by couriering money through public transport. Although a few migrant workers use mobile money, the potential number of customers, the amount of transactions and the overall value proposition for DFS as a channel for these workers can only be established through research.

Value chain research identifies potential touch points for mobile money. For example, when a farmer pays a farm input supplier for pesticides or farm tools, a transaction is made in cash that could be digitised. Identifying these touch points—the payer and the receiver—should enable the DFS provider to design its agency channel appropriately in order to enable customers to load value to make their payments, or for merchants to translate float back into cash or to route value to their bank account.



2. Identify the 'anchor' actor in the value chain

An actor in an agro-value chain is an individual, company or collective, with an active role to play within the chain. A look at any agro-value chain will show that multiple actors are involved, from planting, producing, harvesting, processing, packaging, distributing and finally to marketing. Each actor has distinct yet important roles to play. However, there is usually a dominant actor, who is referred to as the 'anchor' actor of the value chain. An anchor actor has the potential to influence decision-making for most activities within the value chain and can influence the mode/medium of transactions within the value chain.

For example, the 'DFS Fusion in Agro Value Chain Research' report revealed that large milk processors and cooperatives are anchor actors in the dairy value chain. Amos Dairies Cooperative in Western Uganda buys milk from over 4,000 smallholder farmers who deliver milk daily to the cooperative and are paid every two weeks. Farmers are paid in cash at the cooperative's cash office. Amos Dairies Cooperative is in a position of influence and can dictate a change from cash payments to digital payments for its dairy farmers.



Anchor actors in the coffee value chain include Kyagalanyi Coffee and Bugisu Cooperative Union, which act as intermediaries between coffee farmers and the world market. These actors buy coffee directly from their farmers and process, package and transport the coffee for export to the world market. Kyagalanyi and Bugisu can influence their farmers to accept digital payments.



In the tea value chain, anchor actors include McLeod Russel, Mpanga Growers Tea Factory and Rwenzori Commodities. These companies either have their own tea estates, or have registered smallholder farmers who collectively gather their tea for processing and export. Each of these companies employs over 6,000 contractors, tea pickers, pesticide sprayers, weeders and security guards. Salaries are paid in cash, with long queues on payment day. Digital payment may offer a better alternative.



Anchor actors represent the entry point for nearly all the money transacted in their respective value chain, and they have a strong relationship and direct touch with other key actors. Importantly, anchor actors command respect from other actors, who regard them as drivers of business within their value chain and see them as important to their own survival.

Anchor actors studied acknowledge large cash transactions occur and admit fears associated with these transactions, as some have lost large sums of money through highway robberies.

In summary, anchor actors can be from any stage along the value chain, from production, processing, or marketing to delivering the end product to consumers. When considering each actor, it is important to understand the number of people involved at each stage, the role of each actor, and their significance and influence within the value chain.

3. Access the agent network infrastructure to support the value chain

Typically, there is much lower density of agents in rural areas. The absence of an efficient agent network compromises acceptance, adoption and usage of digital payments. Therefore, DFS providers need to evaluate their agent network's quality, numbers and spread in the geographic area of the value chain, and consider liquidity management carefully. Agents need to support the rural community with customer registration, cash-in/cash-out transactions, issue/complaint resolution and product awareness.

Agents in rural areas face particular problems since they are fewer in number and often lack support for liquidity management. These factors make it difficult to integrate agro-value chains with DFS. Researchers for the 'DFS Fusion' research visited seven fish landing sites, which together only had eleven mobile money agents serving a total population of over 35,000 people (i.e., a ratio of one agent to 3,100 people). These agents reported that they average over 80 transactions per day but also turn away transactions because of a lack of float or cash. These constraints suggest growing demand that is putting pressure on the ability of existing agents to hold float.

Although they are willing to accept digitisation of their payments/transactions, the actors in the three value chains studied called on DFS providers to improve the quality, number and spread of agents as a prerequisite to support their financial transactions, before they would be able to fully adopt digital payments as part of their businesses.

4. Evaluate potential complementing environments/activities

DFS adoption, usage and scalability all benefit from a well-developed payments ecosystem, the development of which requires intense activity from DFS providers. Multiple levels of complementing activities or ecosystem development are needed. For example, agro-value chains experience different seasonality patterns. Coffee transactions start in mid-August and continue until January, with few coffee transactions from February to July. Other agro-value chains, like fish and tea and beyond, have alternative seasonality with different payment streams.

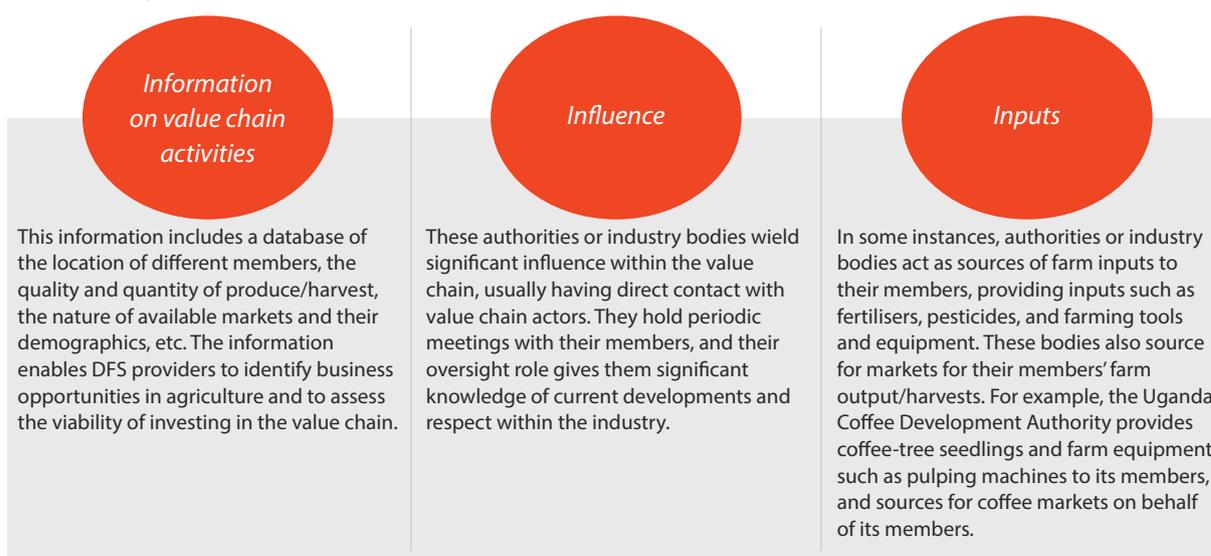
Seasonality implies that DFS providers need to look at digitising other transactions in the community beyond the agro-value chain, which means building a complementary ecosystem in a rural area including wholesale shops, agro-dealers, healthcare centres and schools. DFS providers should also examine whether wholesale transactions can be digitised. If these transactions can be digitised, including stock replenishment transactions, it can mean large physical movements of cash can be avoided, mitigating the risk of theft and further helping to keep physical cash in the rural community that can be used to provide liquidity for agents.

Two other financial mechanisms are commonly used in rural areas: savings and credit cooperatives (SACCOs) and savings groups, such as the village savings and loan associations of CARE or the savings and internal lending communities of Catholic Relief Services. SACCOs provide savings and loan facilities to local members. Savings groups operate as a semi-formal gathering of members who contribute savings and make loans to each other for a defined period, the importance for DFS being that savings groups often hold cash in remote locations.

There is potential to bring SACCOs in as 'super agents' to provide liquidity for agents who have accounts with them, and for SACCOs or savings groups to be further linked to financial institutions through push-pull functionality between mobile wallets and bank accounts. For savings groups, push-pull functionality can provide groups with access to a bank account, which enables them to keep their money safe by using a mobile money wallet to transfer funds to/from their account and which could further enable them to access additional funds for lending through the bank. Agents can perform the cash-in/cash-out transactions for savings groups as required.

5. Leverage value chain authorities or industry bodies

Most agricultural sectors have either state-sponsored development authorities, formed by acts of government, or industry bodies created by the actors themselves. For example, in Uganda, the Dairy Development Authority is in charge of policy formulation, governance and enforcement of regulations that guide the activities of the dairy industry. All coffee activities in Uganda are overseen by the Uganda Coffee Development Authority. Other agro-value chains such as tea, sugar cane and cocoa also have oversight authorities that govern and develop and monitor policies within their respective value chain. Regulatory authorities, such as the Uganda Coffee Development Authority, or industry bodies can be vital for DFS integration as these authorities provide the following:



Working with authorities or industry bodies can provide DFS providers with a platform to influence policy formulation and promote their services through the value chain, while at the same time giving authorities or industry bodies an opportunity to work as ambassadors for DFS products and services amongst their membership.

6. Seek acceptance from the intended customers

A beautifully and carefully designed strategy for DFS integration with agriculture can be created using the best research tools and methodologies, with resources committed to build and fund a healthy agent and merchant network. However, this work means nothing if the intended customers of the solution fail to appreciate and use it. So, how do DFS providers gain acceptance?

DFS providers need to be market-led, which means placing the customer at the centre of product plans, development, marketing and communications, testing, and rollout. Through a market-led approach, customers are provided with solutions that meet their needs, satisfy them and ensure an improved user experience.

In July 2015, a joint team from Kyagalanyi Coffee, *MicroSave*, MTN Uganda and UNCDF visited Mount Elgon rural villages in the districts of Kapchorwa, Manafwa and Mbale for a scoping mission seeking to integrate DFS and the coffee value chain. Over the three-day site visit, the team spent hours interacting with coffee farmers from all levels (i.e., farmer leaders, small- and large-scale farmers). The discussions were involved and participatory as they examined proposed solutions that work for farmers and meet their financial needs. The farmers provided clues for agent scoping within the communities and gave names of potential agents. The eventual solution derived was considerably different from the initial concepts created prior to the research.

Two major lessons were observed:

- The team realised that many products are developed and launched in institutional boardrooms on the basis of little to no research and no pilot testing; it is assumed the products work and meet the needs of the market. There is limited consultation, if any, with the intended users of the products, and so products fail. At the end of the visit, the MTN Uganda staff on the scoping mission resolved that direct interaction with intended customers will be sought to guide product design and pricing for future products, to ensure that launched products meet market needs.
- The team observed that current DFS product offerings are based on a 'one-size-fits-all' approach that fails to account for different income levels, occupations, cultural differences, literacy levels, age, etc. Existing offerings target urban markets; pricing structures, language, transaction processes and available products often fail to resonate with rural communities. This lack of customisation in products and channels is one factor in the low adoption of DFS in rural areas.

A visit in April 2015 by a team from *MicroSave*, UNCDF and Vital Wave to tea estates in the Kabarole district of Western Uganda also involved direct interactions with tea estate casual workers, in order to plan for their salaries to be paid through mobile money rather than cash payments. By the end of the focus-group discussions, workers expressed needs for savings and credit facilities and gave estimates for interest rates that would be affordable to them, in order for them to adopt DFS.

The two visits clearly highlight that direct interactions with intended customers help create value propositions that work for each community, thereby driving acceptance of DFS.

What should influence a digital financial service provider's decision to invest in an agro-value chain?

Not all value chains have the same potential for DFS integration. Factors which DFS providers need to consider include the following:

1. Commercial viability of the value chain

The selected value chain must demonstrate potential to generate revenues that enable the DFS provider to earn a return on its investment, perhaps not in the near future but at least that revenue projections establish a break-



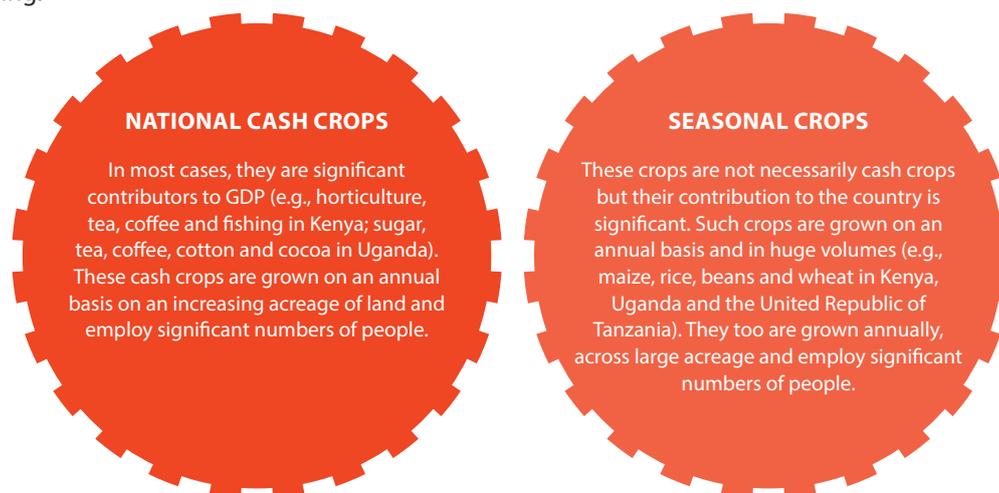
even point. Research must demonstrate that the numbers of participants in the value chain, the transaction volumes and the structure of transactions show potential for digital payments at a price participants are willing to pay.

A second factor in determining commercial viability is to evaluate ‘spill-over’ effects, once participants in a value chain start to use mobile money more widely. For example, over 40 percent of the tea estate casual workers in Kabarole, Western Uganda, were found to be migrants from other districts and from as far away as Rwanda. When migrant workers remit money to their families, recipients will make chargeable withdrawals. However, this spill-over can only happen if recipients are able to receive money digitally and are able to use the solution.

Further potential to develop transactions in the community needs to be ascertained when evaluating the commercial potential of a value chain. This potential can include developing merchant payments. For example, in the case of tea workers, they can spend their salaries at least in part digitally, which in turn encourages them to keep value in their mobile money account—increasing both the use of DFS and the volume of transactions.

2. Scalability of the value chain

The choice of value chain should be guided by the value chain’s long-run potential. Ideal value chains have outputs that are in growing demand, giving DFS providers confidence in a long-term business opportunity with continued revenues. Characteristics of agro-value chains that meet the need for scalability include the following:



3. Available partnerships

Developing DFS infrastructure in rural areas is expensive in terms of capital and operational expenditure. For example, internet and telecommunication signals require the construction of base transceiver stations (BTS), commonly known as telecom masts. The cost of setting up a single BTS is typically no less than \$300,000, and the cost increases with operational expenses of powering each BTS daily. Other significant costs involve the building and development of a healthy agent network to serve customer needs.

To mitigate some of the costs, DFS providers can seek partnerships with institutions involved in agriculture that can benefit from DFS. Due to limited financial services in rural areas, commercial operations paying large volumes of salaries (e.g., McLeod Russel tea company and Kyagalanyi Coffee in Uganda) incur significant expenses to move cash, provide security for cash and make cash payments. In such circumstances, finding ways to cost share can be of significant benefit to both parties. In Uganda, for example, McLeod Russel senior officials offered free land within their tea estate to any telecom company that needed to construct a BTS to strengthen its signal.

What issues should be resolved to enable seamless integration of digital financial services and agriculture?

- Pricing.** Low income levels and poverty are common in rural areas. Multiple research exercises in rural areas indicate that the cost of transactions is an impediment to adoption and usage of DFS. DFS providers are seen to price their services beyond the reach of the majority of the rural population. If farmers and the people employed in agriculture are to adopt and use DFS, solutions to make DFS more affordable need to be developed. Affordability could drive greater adoption of DFS in rural communities.
- Phone penetration.** Most African countries report over 70 percent phone penetration; however, this figure may not be representative of the situation in rural communities. Phone penetration studies often overlook multi-SIM card ownership and thus overestimate actual phone ownership. The two visits into rural Uganda described above placed phone penetration in the coffee growing community in Eastern Uganda at 41 percent and the tea growing community in Western Uganda at 30 percent (based on interviews and employee databases from tea estates and Kyagalanyi Coffee).

When considering integration of DFS with agriculture, low phone penetration in rural areas is a real and present challenge. A possible solution is to lower the cost of the phone handset, which is regarded as high in these communities. Although efforts have been made to develop generic low-end phone handsets, often the benefits of these low costs are not passed on to the final consumer since margins are absorbed by middlemen. Mobile network operators could play a role, perhaps having some channel partners deliver handsets to intended low-income users at a fair and affordable price.

Another possible solution to the barrier of phone penetration is for DFS providers to deliver their services to rural agricultural communities without the need for a phone (e.g., delivery through card-based payments solution). IWI Africa (<http://www.intelworld.co.ug/>), a technology innovator, has developed a very low-cost (\$0.04) 'near-field-communication' device that can be worn on the wrist. Products such as these enable DFS providers to deliver their products without phone penetration being a barrier.

- Product offering.** The products currently being offered need to be examined. Beyond airtime top-ups and remittances (cash-in/cash-out), the current array of products has been designed to meet the needs of urban clientele. Rural communities across many African and Asian countries have low connectivity with national water and electricity grids and cannot afford pay television, so they are unlikely to use traditional



bill payment options. However, there are potential needs for micro-saving and lending products, salary payments, remittances, school-fee payments, specific value-chain-based products/merchant payments and potentially micro-insurance.⁶

- Telecommunication coverage.** DFS need telecommunication signal coverage, whether for mobile-wallet or card-based solutions. For many solutions, the internet must link, interconnect and transmit the information required to initiate and complete transactions. Connectivity will require attention from DFS providers in many geographic areas.
- Fraud.** DFS is a channel to deliver financial services, therefore trust in the channel is a must. As a result of close community ties in rural agricultural communities, information spreads easily by word of mouth, and news of fraud or instances of lost funds can spread very quickly. Most DFS providers have put in place mechanisms to deal with internal fraud; however, these efforts must extend to fraud prevention and resolution at both the agent and customer levels too.⁷
- Low literacy levels.** Rural agricultural communities are characterised by low literacy levels; many people in rural areas cannot read, write or speak in English or any internationally recognised language. Unfortunately, user interfaces currently deployed for DFS are in written format and in English or another international language. For DFS-agriculture integration, simple user interfaces that can be understood easily by the semi-literate are required to deal with low literacy levels. Solutions could include animating user interfaces, allowing agent-aided transactions (which are an easy target for fraud), writing user interfaces in local languages, using interactive voice response and conducting user interface training programmes, amongst others.

Is there a role for philanthropists and donor agencies?

Many developing countries have a strong agricultural sector, but they are characterised by low financial inclusion levels. The integration of DFS and agriculture has the potential to link rural populations not just to an agricultural payment channel but to a full range of financial services (e.g., credit, savings, remittances, insurance and even agriculture-specific services like connecting farmers to markets). However, developing an efficient DFS ecosystem is expensive and time-consuming and requires expertise and research. Setting up and managing day-to-day operations is expensive. These challenges call for investment from development partners for proof of concept, product development, rural literacy programmes to encourage DFS usage, and later roll-out of proven models.

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6 Isaac Holly Ogwal, 'Tracing the customer journey,' Digital Financial Services in Uganda Briefing Notes, No. 2 (2015). Available from http://www.uncdf.org/sites/default/files/Documents/bn2_uganda_v7.pdf

7 Isaac Holly Ogwal, 'Survival of the Fittest: The Evolution of Frauds in Uganda's Mobile Money Market (Part-I)', August 2014. Available from <http://blog.MicroSave.net/survival-of-the-fittest-the-evolution-of-frauds-in-ugandas-mobile-money-market-part-i/>