Digitizing Value Chain Payments

A digital solution from Ghana

About the Mastercard Foundation

The Mastercard Foundation seeks a world where everyone has the opportunity to learn and prosper. The Foundation's work is guided by its mission to advance learning and promote financial inclusion for people living in poverty. One of the largest foundations in the world, it works almost exclusively in Africa. It was created in 2006 by Mastercard International and operates independently under the governance of its own Board of Directors. The Foundation is based in Toronto, Canada.

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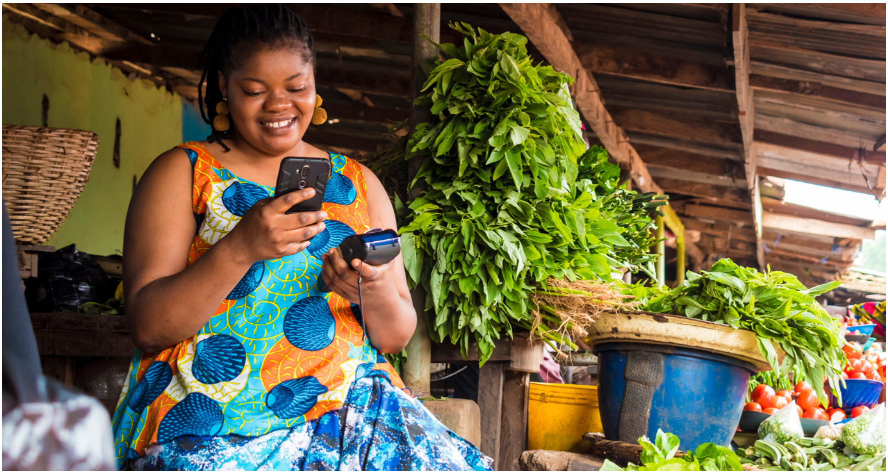
About AGRA

Alliance for a Green Revolution in Africa (AGRA) is a partnership-driven institution that is African-led and farmer centered. Established in 2006, AGRA places smallholder farmers at the center of the continent's growing economy by transforming their farming beyond the solitary struggle for survival, into thriving businesses. Our partners include African governments, researchers, development partners, the private sector and civil society working primarily with smallholder farmers - men and women who typically cultivate staple crops on two hectares of land or less. Our five-year strategy (2017 – 2021), aims to catalyze and sustain an inclusive agricultural transformation through integrated, country-based investment plans in 11 countries with a high potential for success. The focus is on increasing incomes and improving food security for 30 million farm households with support that strengthens the capacities of governments and private sector through policies, programs, and partnerships that increase productivity and access to markets and finance.

For more information, visit: www.agra.org



Foreword

This learning brief captures the overview and progress to date of Tanager's digital agriculture payments and financial services project in Northern Ghana. It attempts to document and highlight the main lessons encountered during implementation.

At the start of the project Tanager set out to work with a range of agribusinesses – seed suppliers, produce buyers and input-output traders to address the risks associated with agriculture payments. The core issues faced were delayed payments for farmers, costs and risks associated with carrying cash and high administrative costs of cash management at the agribusiness level. Tanager launched an ambitious partnership with two major service providers – Vodaphone and Bharti Airtel, addressed these key issues by developing the capacity of agribusinesses in integrating with and managing digital payments solutions, introducing farmers to mobile wallets, and facilitating an ecosystem of agents for cash in and cash out. In doing this they built the foundation for future work in digital financial services in one of the more challenging locations for mobile money.

The development of the model used by Tanager continues with the engagement of Farmerline, a local partner and third-party mobile platform provider assisting agribusinesses to process and track payments through their mobile phone wallets. Farmers see clear value in the product with payment lags of three months getting substantially reduced. Further learning is necessary on the new types of use cases for rural payments and also financial products, in order for the mobile money ecosystem consisting of Mobile Network Operators (MNOs), mobile money agents, financial services providers and value chain actors to grow sustainably and generate benefits for all.

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Acknowledgement

AGRA's mission is to improve yields and incomes by 2021 for at least 30 million farming households through a series of integrated, country-based programs in partnership with a wide range of private and public sector actors. In order to achieve this mission, a key component is improved access to affordable financial and non-financial services for smallholder farmers seeking to intensify and improve their farm practice.

The emerging digital highways have enabled farmers across Africa to interact with input suppliers and commodity markets more efficiently and more intelligently than ever before. Growth in mobile money usage in Ghana, Kenya and Tanzania make the delivery of financial services to farmers much cheaper and less risky. With less physical infrastructure required to reach farmers, and as more data on smallholder farmers becomes available for analysis, certification and rating purposes, the transactional risks are reduced.

AGRA, in partnership with Mastercard Foundation has provided matching grants and technical expertise to 22 partners to accelerate their innovative business models for (financial) service delivery to small scale staple crop farmers in Ghana, Kenya and Tanzania. The grant and technical assistance support our partners in probing, piloting and scaling the (digital) financial and non-financial solutions that present a business case for all partners and an end-to-end solution for smallholder farmers.

Since the start of the partnership in 2015, we have learned a lot of lessons from farmers, service providers, value chain actors and colleagues who are also operating in the digital finance and ICT4Ag space. This first series of three case studies documents some of the lessons in the following areas:

- Digital payments as a key enabler for rural financial inclusion in Northern Ghana
- Supply chain finance and digital payments for staple crop farmers in Kenya
- The role of digital platforms in structuring markets in Kenya

We would like to thank our implementing partners Tanager, Umati Capital and Eastern Africa Farmers Federation as well as our learning consultant, Rewa Misra, for the

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Glossary

Account access	The number of adults reporting owning an account in any formal financial institution.
Account in use	An account (whether held in a financial institution or mobile money) that has been operated at least once in the last 12 months.
Financial inclusion	Access, use and sustained use of financial services and complementary non-financial services.
Mobile account access	The number of adults reporting owning a mobile payment account.
Range of outreach	The range of financial and non-financial products and services that a household can access at one point of sale.
Scale	Market penetration (the ratio of customers reached to market potential) and/or market expansion (the inclusion of new segments at the market level) as an indication of scale.
Smallholder farmers	Farmers in non-competitive value chains with landholdings less than 15 acres.
Sustainability	While detailed financial analysis will be beyond the scope of these briefs, we will estimate high level measures that allow us to assess whether market expansion is contributing to significant growth in revenues in relation to costs.
Client value	Product range and timeliness (opportunity cost) and qualitative factors such as trust or social value.

Background

In Ghana, Tanager has been complementing the development of agribusiness markets by linking agribusinesses with ecosystems for cashless banking as a bridge between rural communities and brick-and-mortar banking services. In order to roll out mobile payment platforms across supply chains, and provide last-mile financial services to rural farmers, Tanager partners with agribusinesses, producers, and mobile network operators to streamline procurement processes. Mobile money platforms reduce the risks associated with agricultural value chain payments and offer an opportunity to extend other (financial) services. Tanager works with financial providers to adapt their services to the needs of agricultural buyers and suppliers, and supports producers to build their financial acumen, establish credit histories, and develop relationships with financial service providers.

This work was initially operationalized with one agribusiness (GADCO) in the rice value chain. With proof of concept, the technology now extends to three different crops (paddy rice, maize, soya beans) and seeds such as maize, millets, groundnut and cowpeas among five agribusiness partners. With financial support from AGRA, Tanager builds partnerships between smallholder farmers, financial institutions and value chain actors through the use of mobile wallets to access payments, credit and saving services. This initiative is a partnership between Tanager and AGRA through the Financial Inclusion for Smallholder Farmers in Africa (FISFAP) program. The key mobile network operator (MNO) partners are Vodafone and AirtelTigo, while the main banking partner was Premium Bank, after DALEX Bank and Capital Bank withdrew from the partnership.

This learning brief gives an overview of how the expansion of digital payments and financial services in Ghana has been promoted, even as the partnership role transitions to a local partner, Farmerline.

The Rural and Digital Finance Ecosystem

At the time of writing this case study (2019) at least one newspaper reported that the number of registered mobile money accounts across the three major telcos in Ghana stood at 29.9 M and had crossed its official population of 29.6 M. However, World Bank FINDEX 2017 shows that account use is a significant issue with only 36% of the population having received a digital payment in the last year. And as elsewhere globally, female use of accounts lags behind considerably at 30.1% compared to male usage at 41.5%. Additionally, only 31.7% of the rural population received digital payments in the last year. Only 10.2% of the rural population has borrowed from a financial institution in the last one year. In this situation, agriculture can be an important driver of rural mobile payments usage in Ghana, as are access to broader financial services such as credit, insurance and savings. World Bank FINDEX 2017 shows that in Ghana, Kenya, and Zambia about 40% of respondents reported receiving agricultural payments into an account, in most cases a mobile money account.

Tanager provides important lessons in this context, having first initiated mobile payments in the rice sub-sector in the Volta region of Ghana in 2013. The core issues faced in the subsector were delayed payments for farmers, costs and risks associated with carrying cash and high administrative costs of cash management at the agribusiness level. To address this, Tanager launched a pilot to measure the feasibility of changing from cash to mobile agriculture payments – to ensure that agribusinesses would be able to pay farmers directly into their mobile wallets. This involved a multi-level strategy:

1. Working with agribusinesses to adapt their systems and processes to pay suppliers (smallholders) digitally.
2. Identifying or establishing rural cash-in-cash-out agents for the convenience of farmers.
3. Educating farmers to use mobile payments and develop greater trust in the system.

Tanager's role in this ecosystem is critical. At one level, agribusinesses do not always see the value proposition of moving towards digital payments. They need training or sensitisation to understand the business case for digital payments. At another level, MNOs find it challenging to expand into rural areas as there is a thin frequency of transactions, and highly dispersed agents. In the case of value chain payments, very often a user will initially carry out one to two large transactions at the time of harvest or just before the planting season. As a result, cash-in-cash-out agents also have erratic cash flows in rural areas. Since most local businesses and service providers do not accept digital payments, there is little use for farmers to leave money in their mobile wallets. Finally, farmers do not trust digital services. Therefore, there was no single actor in the existent ecosystem that took on the role of convincing agribusinesses, MNOs and farmers to work together to digitize payments. Tanager was able to step into this role of a market facilitator, bringing in payment service providers and making the case for diverse stakeholders to develop a patient innovation-oriented mindset to make their project work.

By the end of the pilot, Tanager facilitated mobile payments for approximately 800 farmers for a total value of US$900,000. Among the lessons that have emerged are the need for ongoing training about basic cellphone functionalities, such as SMS messaging, pin codes and how to initiate a balance inquiry, as well as basic financial literacy such as the concept of savings as new subscribers are enrolled. Additionally, although the project identified and actively managed 12 agents, liquidity was an ongoing concern and required on the ground coordination.

Building on these lessons in 2016, AGRA funded the expansion of this initiative to Northern Ghana. Northern Region offers a markedly different context from Volta. With a poverty headcount ratio of ~44% it is one of the poorest regions in Ghana with low levels of private sector development and bank branch presence. Mobile connectivity was patchy even within the region, presenting challenges for completing mobile transactions. In this context Tanager had to adopt a deliberate partnership strategy to address different ecosystem constraints. Key participants for the expanded project are as follows, with Tanager partners indicated in green.

Figure 1: Key Partnerships

Agribusiness partnerships

The expanded project has six agribusiness partners that are largely out-grower schemes. They reached approximately 10,640 smallholders as of September, 2018. The breakdown of farmers trained and enrolled on mobile payment comprises 1,072 for Agriaccess, 2,506 for Agritrade, 923 for Masara, 4,681 for Savanna, 503 for Shinkaafa and 955 for Heritage Seeds. Tanager identified a third-party mobile money platform provider (Farmerline) to assist agribusinesses to process and track payments to farmers irrespective of the network. At the farmer level, interoperability could have been an issue. In the previous pilot Tigo Cash had provided an interoperable voucher code functionality that could accommodate farmers with non-Tigo Cash wallets. In May 2018 the Bank of Ghana launched the Mobile Money Interoperability System, enabling farmers to transact across networks. Importantly, the presence of established buyers in the region meant that farmers had a strong incentive to sign on and test mobile payments. Similarly, agribusinesses are starting to see the benefits of digitizing payments.

Figure 2: Why Agribusinesses Value Mobile Payments

AgriTrade Ltd.

Agritrade works in upper East and Northern regions with 3,000 farmers. About 40% of their outreach constitutes women. Agritrade contracts farmers to purchase surplus paddy rice and maize, and assures the purchase price up to a certain moisture level of paddy. Produce below that level is processed as parboiled rice. They provide seed and other inputs such as agrochemicals and monitor crops. Inputs are provided on credit from the wholesaler and farmers pay this back in kind. Agritrade organises farmers into groups to help manage risks like side-selling and defaulting on payments. Purchasing officers manage the bulk of in-field operations. Agritrade aims to reach 10,000 farmers by 2019.

Tanager contacted them to discuss digitizing payments to reduce the risk of cash handling. The turning point in that conversation came when Agritrade was defrauded of 500,000 Ghc (USD 125,000). Since it was unclear whether a purchasing officer or farmer defrauded them, this incident caused issues both with farmers and staff. Additionally, time was spent in chasing after the lost money.

However, the issue goes beyond payments. As a growing business Agritrade struggles with liquidity. Bank lending rates are high in Ghana and an agriculture business typically faces rates ranging from 33-35% in the region where Agritrade operates. This means they can only work with a limited number of suppliers and liquidity mismatches can also pose a risk to their partnerships with wholesalers and farmers alike. Agritrade recognises that paying farmers digitally could demonstrate the creditworthiness of their overall business. Additionally, they also want farmers to have access to savings. According to Agritrade's CEO Joshua Atia, smallholders are savings-constrained and store their money by holding back bags of produce from the market. The partnership has three objectives: 1. Collect and manage credible data on smallholders. 2. Refine the payment system. 3. Develop partnerships for diverse financial services with banks.

Commercial bank partnerships: In response to the need for broader financial services beyond payments, Tanager has developed a partnership with Premium Bank to offer savings services. It has not been easy to find willing commercial bank partners given the low density of bank branch infrastructure in North Ghana overall as well as the small scale of the program. Premium Bank, part of the Vanguard group, is an investment bank with a focus on SME finance. Although they were interested in expanding into rural areas, in the absence of a branch network, they opted to test a mobile banking product 'Jara'. Their partnership with Tanager begun in October 2017, and Jara was piloted with 500 farmers. However, the product reaches 10,000 customers overall, of which about 30% have balances of over GHc100 in their wallet. Premium Bank has found the partnership with Tanager valuable at multiple levels, including access to farmers through Tanager, Vodafone, Airtel-Tigo's agent networks, and support for farmer education. The ramp-up to provide savings has not been easy for Premium Bank, particularly as it is difficult to build customer trust in the absence of branches. Working in partnership with established providers and facilitators like Tanager therefore assists the bank to develop a critical mass of clients.

Non-Bank Providers: Airtel-Tigo, the original partner, noted that both the core GSM business and agent availability were quite weak in the Northern region and their initial assessment of the project was not positive. However, bringing om board Vodafone and Airtel-Tigo together meant that farmers had options as far as connectivity was concerned and that both Airtel-Tigo and Vodafone could reinforce each other's agent networks with Tanager undertaking agribusiness training for agents. The non-bank providers came to the table with a mindset to test and learn. Vodafone was particularly interested in seeing if mobile payments could be an entry point for other financial services such as credit or insurance, while Airtel-Tigo were keen to see if mobile wallets could become a driver for airtime purchases. However, there were a few challenges in bringing agribusinesses on board. In the Volta project, agribusinesses were charged a fee of between 0.75% and 1% of the transaction cost. Agribusinesses in the Northern Region were initially highly resistant to signing on for the project. Airtel and Vodafone therefore waived the charges for sending money to farmers which allowed agribusinesses to pay farmers at no cost to their wallets. In addition, mobile money agents observe which networks generate the most activity and focus on keeping their float available for them. This means that MNOs compete at the agent level and carefully manage their commission structure. Although MNOs provided training to farmers on how to use mobile wallets, one year into the project, there were relatively few farmers using mobile wallets for airtime purchases. However, both MNO partners identified opportunities to build out credit offerings, having tested these in other parts of sub-Saharan Africa.

Agents: A key dependency for the project was having agents present to enable farmers to cash-out or cash-in payments. According to Judith Adumua Bossman, the Head of Digital Money Airtel-Tigo, a large project specific agent network was not a commercially viable proposition. However, Tanager, Vodafone and Airtel-Tigo set up an initial network of 30 agents (called field officers) and trained them on agriculture payments as well as how to work with agribusinesses. Tanager has also identified farmer representatives who keep peers informed about products and services. Although agent liquidity continues to be an issue, Tanager has addressed this by linking agents to local rural banks and keeping close communication and coordination with agents.

Products and Services

Use cases

Farmer registration for mobile wallet

This is typically completed during a farmer training session held jointly by Tanager, Vodafone and AirtelTigo. Farmers initiate the registration by dialing a USSD short code. Farmers are asked to provide their national identification card or a voter's identity, national health insurance card, license or passport. Details are pulled into the mobile wallet for registration. Farmers are then asked to make an initial deposit to activate their mobile wallets. They are taught to use this to buy airtime or buy credits for their mobile wallet. Farmers are also taught to make deposits and withdrawals at this time. Every farmer is assisted to select a four-digit pin.

Business to person payments

Each agribusiness maintains a database of farmers. At the time of collecting produce they obtain the farmer names, mobile numbers, product quantity, grades and the amount to be paid (net of input costs). This information is sent to Tanager which validates it to ensure that farmer phone numbers are correct and active. The agribusiness transfers the payment to the farmer's paytime wallet at zero cost. In case there is still a farmer with an inactive number, an alert goes to Farmerline, who transfer the details to a live form for future payment when the new number is received.

Savings

Most customers prefer to leave some money in their Vodafone or Airtel-Tigo wallet using it as a "current account". Premium Bank's Jara product allows them to access a savings account that pays marginally higher interest than the typical mobile money account in Ghana. Jara pays 12% per annum (compounded monthly) on savings balances. Premium Bank uses the existent registration and data management platform (Farmerline) and verifies the farmers' phone number, date of birth and identity document online. They then open an account and enable withdrawals. Farmers are required to maintain a minimum balance of 5 USD. Deposits are insured under Ghana Deposit Protection Act, 2016. Tanager has assisted with the set-up of about 90 mobile agents who are tasked with sign-ups, first-cash-in and frequent activity for the farmers. Premium Bank in partnership with Tanager developed a remuneration package that pays for the daily activity of the agents. Premium Bank agents set up constituent existing agent network of Vodafone, Airtel-Tigo and agribusinesses.

Customer value

Focus Group Discussions with clients provide insights as to why digitizing business to payments services is critical for farmers. Heritage Seeds is the first agribusiness to join Tanager's expanded project. Heritage Seeds provides inputs on credit and farmers supply certified seeds back to the company. Heritage and its farmers, work on a tight cycle of supplying seed for groundnuts, soya bean, maize, rice and cowpea. For example, groundnut seeds can be produced and supplied in one month following which soya bean seeds can be produced. While not all farmers will grow the seeds for all the crops, the gestation period is much shorter than a typical crop cycle and the timing is critical. Once purchased, seeds have to be cleaned, sorted, certified and marketed before payment can be made to farmers. For a seed producer, cash flow is crucial as they may be planting intermittent short and long gestation crops and have an ongoing need for inputs. However, if payments are delayed, this could affect their investment decisions over the course of an entire year or they may even drop out of the partnership arrangement with the agribusiness.

Morrison, a farmer aggregator, says that previously it would take up to three months for a farmer to get paid. Morrison is responsible for collecting farmer data and, in the manual system, was also responsible for disbursing cash to farmers. He reports that delays were the result of adverse events – a payment getting lost or stolen. Or the person delivering the cash (an agent or farmer aggregator) may be traveling or sick. Also, sometimes the farmers themselves might not be available to receive the payment. However, with mobile money the payment is automatically credited to the farmer's wallet within a much shorter period of time. Once the agribusiness is paid, mobile payments to farmers can be completed within three days. Farmers perceive this service as cheaper and more convenient as agents sometimes visit them to process transactions.

A subset of Heritage Seeds farmers is testing the Jara platform. Farmers gave their approval for Jara and have used it to save money. Some reported that in an emergency they would use money on their mobile wallet first and from the Jara platform last. However, some farmers stated that the $5 or Ghc 27 minimum balance requirement initially discouraged them from signing on. Additionally, they felt they needed more training on making deposits and withdrawals as the menu is more complicated than what they use for payments.

Gains for Key Business Partners

The most tangible benefit in the project at this stage is for agribusinesses. As can be seen from the calculation below, digital transactions decreased cash handling costs by nearly 70% for Heritage Seeds. While we do not have specific profitability figures for Heritage Seeds, they report that they know they have considerably reduced costs relating to managing cash estimated at 5% of the overall costs of the business.

An initial calculation on the cost of cash is as follows:

Table 1: Heritage Seeds Reduced Cost due to Digital Payments

Cost of Cash	**Amount**	**Examples of functions to explain number of days/months**
Line items		*Manager*
		Float preparation
a. Monthly wage key personnel	*$*	Reconciliation
Cashier /Cash disbursement officer	1500.00	Bank withdrawals
Accountant	1600.00	Other banking
Manager	2500.00	*Cashier/cash disbursement officer*
		Float verification
b. Time dedicated to cash handling in days/month	*% of the Month*	Reconciliation
Cashier /Cash disbursement officer	0.40	Cash counting/ vault management
Accountant	0.67	*Accountant*
Manager	0.30	Book entry
		Cash counting and reconciliation
c.Personnel cost for cash handling (a*b)	*$*	Other record keeping
	600.00	*Manager*
	1066.67	Float preparation
	750.00	Reconciliation
d.Total personnel cost of cash	**2416.67**	Bank withdrawals

FISFAP Partners

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