CASH USAGE BEHAVIOUR AND ITS IMPLICATION FOR DIGITAL PAYMENTS

A CASE OF GHANA and NIGERIA'S SMALL-HOLDER CASSAVA VALUE CHAIN

BY LHB ASSOCIATES, FARMERLINE LTD, FLV NIGERIA AND KOWREE

FEBRUARY, 2017

Table of Contents

Table of Contents

List of Figures

List of Figures

Executive Summary

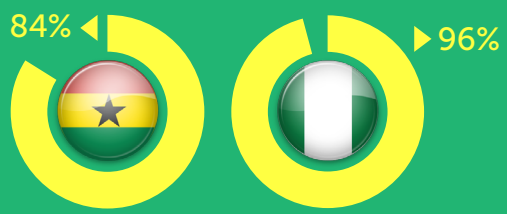
This study was commissioned by the Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA) to assess the financial behaviour of cassava farmers in Ghana and Nigeria, in relation to their usage of cash and their interest in mobile payments for their farm products as a gateway to serving other mobile finance (mobile money and mobile banking) needs. The study used a mixed methods approach with a focus on smallholder farmers.

Six (6) focus group discussions (FGDs) were held in Ghana and Nigeria with a total of 48 and 36 farmers, respectively. For the quantitative research, 460 farmers were randomly sampled from the three main cassava producing regions in Ghana namely; Ashanti, Volta and Brong-Ahafo regions. In Nigeria, a total of 449 farmers were randomly sampled in Ozoro, Oleh and Olicha.

The study provides relevant information from the perspective of; farmers, commodity buyers and mobile financial service providers (MFSPs). From the perspective of cassava farmers' awareness and usage of financial and mobile services, the study highlights:

That cassava farming is dominated by an aging generation of farmers

A great majority of farmers do their transactions in cash.



That 84% of farmers in Ghana and 96% of farmers in Nigeria own mobile phones.

That agriculture is the main source of income for most smallholder farming households.

The main barriers to mobile finance (mobile money & mobile banking) for the rural and agricultural poor are low financial literacy levels and lack of awareness.

That farmers have a clear need, in addition to mobile payment for crop, for other mobile payment services to replace most, if not all, of their cash based transactional activities such as payment of bills, school fees, agro-inputs, electricity and food.

The high rates of cash transactions and mobile phone ownership imply significant potential for transition to mobile crop payments and other payment streams.

From the perspective of commodity buyers the study reveals that digital payments for crop are acknowledged as more efficient than cash payments. These efficiencies are perceived to be gained from reduced costs and reduced risk of theft and increased safety of personnel. From the perspective of the MFSPs, in Ghana there is clear appetite to expand into rural areas as evidenced by their initiatives in cassava, rice, cocoa, oil palm, rubber, horticulture, dried fruits, maize and soya bean.

As such, a key message of the report is that agricultural value chains that pay farmers in cash have – by definition – a value chain efficiency gap. Mobile payments for crop is an intervention that can close that gap and improve the lives of farmers by providing them with a financial identity, convenience, reduced costs, privacy and other benefits. Although mobile money schemes are mostly prevalent in urban settings, there have been initiatives, which have innovated mobile money business models in rural areas that are aligned with local market and customer needs. Increasing access to agricultural digital finance not only creates new market opportunities for businesses, but also provides a vital service to smallholder farmers.

The study therefore offers the following recommendations:

- Given the aging population of farmers there should be a policy to encourage the involvement of more youth in agricultural production. It is therefore important for interventions to encourage the youth to take up production of cassava.
- Radio, peer learning and TV have shown to be effective tools for overcoming these financial literacy and awareness barriers.
- Given the characteristic of youth as early adopters of ICT/mobile, this will drive the use of mobile money services thereby deepening the financial inclusion for farmers.
- Mobile money operators should collaborate with agribusinesses to strengthen their agent and merchant networks where farmers live and work. The agents should be equipped to train farmers who interact with them in order to improve their understanding and use of mobile money services. In addition, agent liquidity is critical if farmers are to find mobile money services more attractive.
- Education of farmers about the features and benefits of mobile money is needed to build their capacity to know how to use these services and build trust in using them.
- Providing incentives to farmers who patronize mobile money services should be encouraged to entice farmers and users to patronize the services.
- Deliberate and strategic marketing and partnership is required to promote proper savings and encourage cash light/ cashless transactions using mobile money services.

Financial Behaviour of Cassava Farmers In Ghana

Cassava production in Ghana is dominated by an adult population of farmers who are above 30 years **(88.7%)**

Few youth (18 to 30 years) are engaged in cassava farming in Ghana **(11.3%)**

More women (52.6%) in the sample population sell to cassava processors than men **(47.4%)**

14.80% of **registered mobile money** users do not do any transactions on the platform

Majority **(91.5%)** of cassava farmers in Ghana do their **business transactions in cash.**

GHC 251 ⟷ GHC 1,000

29.3% of farmers income range each month

GHC 1,001 ⟷ GHC 3,000

39% of farmers income range each month

52.8% of cassava farmers surveyed **personally use mobile phone**

71.1% of farmers were willing to use their mobile phones for **financial transactions**

Ownership of mobile phones among **women (53.6%)** was higher than **men (46.3%)**

83.6% of cassava farmers **own mobile phones**.

60.4% of cassava farmers surveyed are aware of **mobile money**

Financial Behaviour of Cassava Farmers In Nigeria

Cassava production in Nigeria is dominated by an adult population of farmers who are above 30 years **(82.2%)**

Few youth (17 to 30 years) are engaged in cassava farming in Nigeria **(17.8%)**

Ownership of mobile phones among **men (45%)** was higher than **women farmers (35%)**

Female farmers (55%) are more than **Male farmers (45%)**

100% of cassava farmers do their business transactions in **cash**

88.6% of cassava farmers earn **N60,000 (US$192)** or less per month

53.3% of **women** and **46.7%** of **men** own mobile phones

4% of farmers have used **mobile money**

39% of farmers are aware of **mobile money**

42.8% of cassava farmers are willing to use their mobile phone for **financial transactions**

Chapter 1: Context

Introduction

Cassava is an important food crop that contributes to food security in terms of providing calories and serving as an income source for many farmers. It is one of the most commonly grown roots and tubers in Ghana and has recently been declared as "Crop of the Decade" by the African Union according to an article by Business and Financial Times (2016). Cassava is not only drought resistant but can be processed into gluten free flour with the same flavor and other characteristics as wheat. It is reported that about half of the global production of cassava is from Africa (FAO & IFAD, 2005). According to the same report, from 1961 to 1999, the total production of cassava in Africa tripled from 33 million tonnes/year to 87 million tonnes/year. The majority of the dramatic growth in cassava production in Africa was accomplished in Ghana and Nigeria and was attributed to the increase in cultivated area and yield. It is estimated that beyond the quantity of cassava produced annually, an additional 30% remains in the ground unharvested (Onumah et al., 2008) due to lack of buyers, or more probably weak marketing connections (Kleih et al., 2011).

Ghana is the second largest cassava producer(after Nigeria) in Africa, contributing about 22% of Ghana's agriculture GDP (Otoo, 1998). Data from the Statistics and Research Information Directorate of MoFA (2013) reveals that production of cassava in Ghana has increased by approximately 33% from 9,731,000 Mt in 2002 to 14,547,000 Mt in 2012. This increase has been attributed to the increase of land under cultivation (WAAP, 2009; Kleih et al., 2013). This means that cassava's contribution to Ghana's economy is higher than that of any crop including even cocoa which is acclaimed to be the backbone of Ghana's economy (WAAP, 2009).

In Nigeria, cassava is considered a 'poor mans crop' and only 15% of farmers use fertilizer. Almost all farmers receive cash payments for their crop. While in Ghana cassava farmers produce other crops as well, Nigerian cassava farmers have very little crop diversification. Nevertheless, even though it is a subsistence crop with a fragmented value chain, Nigeria is the largest producer worldwide. Unfortunately, the 'industrialization' of cassava in Nigeria is constrained by private sector importers of wheat who consider cassava's potential substitution of wheat as a threat.

OBJECTIVES

Attitudes, practices and knowledge around money vary widely between countries, and the specific value chain a farmer participates in will strongly influence their financial options and behaviors. With CTA's interest in the potentials of digital financial services for agriculture such as mobile payments for farmers' products, other payment streams for financial inclusion of farmers, index base insurance services, and digital services to support access to loans and credits, this study specifically considered what might be lessons learned from the cassava value chain.

The main goal of this research is to conduct a comprehensive market study of cash usage behavioral practices and financial literacy of farmers in Ghana and Nigeria. The study specifically:

- Analysed the demographic profile of targeted farmers in Ghana and Nigeria within the cassava growing regions
- Mapped the production and marketing cash payment flows
- Analysed the experience of targeted farmers with mobile money and its potential for adoption

This study provides a common framework and approach for how cash usage behavior (CUBeR) can be assessed for farmers not only in cassava but more broadly for farmers in other value chains in ACP.

Chapter 2: Methodology

Approach

This comprehensive market study of financial literacy and cash usage behavioral practices of farmers entailed mainly primary data collection. The study used a mixed method approach of qualitative and quantitative data collection techniques. The study in Ghana focused on cassava farmers from the three (3) regions namely Volta, Ashanti and Brong Ahafo that are leading producers of the crop. The study in Nigeria focused on cassava farmers in the communities of Ozoro, Oleh and Olicha. Emphasis was placed on the farmers who sell their produce to processors.

The data collection was carried out in four phases:

Phase I – In addition to secondary data collection, primary data collection was carried out with key informants, with an illustrative open-ended question set. Interviews were conducted with key experts from NGOs, private sector, academia, commodity buyers, financial institutions, service providers, regulators, Ministry of Agriculture and other stakeholders involved in agriculture in general as well as cassava specifically.

Phase II – In order to capture very basic data to inform the focus group discussions (FGDs) and individual surveys, the USSD/Voice functionality of Farmerline's Mergdata platform was used to survey over 2000 farmers in Ghana. In Nigeria the citizen engagement platform Kryout, provided by Kowree, placed calls to 500 farmers resulting in 328 phone replies from farmers. The results of these direct to farmer surveys informed subsequent design of Phase III and Phase IV instruments.

Phase III – In Ghana, there were 6 FGDs organized across the study areas with 8 farmers per discussion. In Nigeria, there were 6 FGDs with 6 farmers per discussion. Using an approved focus group discussion guide, the teams had discussions with a total 48 farmers in Ghana and 36 farmers in Nigeria.

Phase IV – In Ghana, 460 farmers were surveyed using an approved survey instrument that was deployed on Farmerline's Mergdata electronic survey platform. In Nigeria, Farmerline's Mergdata platform was also used but was implemented by FLV to survey 449 cassava farmers. Enumerators in Ghana and Nigeria were trained on Mergdata as well as on the use of the mobile devices on which the Mergdata application was installed for the capture of survey data. Captured data was synced onto the platform which was exported to excel (SPSS was also used) for further analysis.

Sampling

Qualitative Approach

Selection of FGD participants was based on a random sampling methodology and recruitment questionnaire. Participants included both male and female farmers. Two team members; a facilitator and a note taker facilitated each focus group discussion.

Quantitative Approach

Proper estimation of sample size for the targeted farmers in Phase IV is quite complex due to lack of adequate information about the number of farming households in the study areas. Thus, a few assumptions have been to determine a representative sample size based on a 95% significance level with the following statistical formula:

$$n = \frac{P(1 - p) \times Z^2}{e^2} \times Deff$$

Where:

- n = required sample size
- p = proportion of households who could be involved in the selected commodity farming in each of the rural community/farm settlement. (We assume this to be 50% as that is the closest standard probability measure required for estimation of population parameter)
- e = sampling error (degree of accuracy desired), usually set at ±0.08
- z = the standard normal deviate, usually set at 1.96 which corresponds to the 95% confidence level
- Deff (Design Effect) = 1

Therefore, 150 is the sample size of farmers for each of the three primary sampling units (PSUs) in each country surveyed for the quantitative part of the study. Therefore, the total number of farmers actually surveyed in Ghana was 460 and in Nigeria was 449.

Chapter 3: Research Results in Ghana

Key Informant Interviews and Secondary Data Collection

The central bank of Ghana issued mobile money guidelines in 2008. In pursuit of interoperability they mandated that each service provider have at least three participating banks. These regulations were ill designed, stifled the build out of mobile money and actually incentivized closed-loop systems rather than promoting interoperability. In July of 2015 the central bank of Ghana reissued their guidelines and more clarity has emerged. These guidelines are now highly regarded within the industry as setting the standard for mobile money regulation.

Like elsewhere in most of Africa, mobile money in Ghana is led by mobile network operators (MNOs). There are four MNOs that provide mobile money services in Ghana; Tigo, MTN, AirTel and Vodafone. In March 2017, Tigo and Airtel announced their intent to merge. According to the Ghana Chamber of Telecommunications, since 2011 the growth in the number of mobile wallets has increased 420% to 13 million. Mobile money transactions grew from 10 million to 267 million and the aggregate value of those transactions grew from GH400 million (€86M) in 2011 to GH35 billion (€7.5B) in 2016 (Dowuona, 2016). Ghana is also a member of the Better than Cash Alliance (BTCA) housed at the United Nations Capital Development Fund.

The BTCA is a partnership of governments, companies, and international organizations that accelerate the transition from cash to digital payments in order to reduce poverty and drive inclusive growth.

Vodafone in Ghana is implementing an mAgri grant from the GSMA. TigoCash continues to implement Rice Mobile Finance (RiMFin), an initiative that pays rice farmers in Volta region with TigoCash, with Wienco Inc. even though funding support from VISA expired in 2014. TigoCash is also the partner for a US$433K (€401K) initiative from IFAD to introduce mobile payments in cocoa, dried fruit and palm oil. World Bank/CGAP is currently in discussions with Cargill and is providing technical assistance to Olam to digitize their cash payments to their cocoa and cashew farmers.

The World Cocoa Foundation has already conducted similar cash usage behavior research (CUBeR) for the cocoa value chain in Ghana. It will be worth noting some of their high level findings from October 2015 for comparison to the results of this report about cassava farmers in Ghana:

- 94% of cocoa farmers have a mobile phone versus 84% of cassava farmers
- 92% of cocoa farmers are willing to use mobile money versus 71% of cassava farmers
- 30% of cocoa farmers have a bank account versus 47% of cassava farmers
- 15% of cocoa farmers have a mobile wallet versus 63% of cassava farmers

The results between the cocoa research in 2015 and this cassava CUBeR might be explained by the difference in time and/or as differences between the value chains. Nevertheless, an agricultural economics professor at the University of Ghana states "we have to catch up with this mobile money technology because it is safer and easier to move money around ."

Meanwhile, cassava processors state that government support for cassava in Ghana is "non-existent" and "flour millers don't want cassava" and "high quality cassava flour has never been produced". Cassava is consumed primarily as a starch. Mobile payments were perceived to be of benefit for the supply chain as well as of benefit to the farmers.

Observations from Focus Group Discussions

As part of the research methodology, focus group discussions (FGDs) were held to provide rich insights in order to inform the design of the subsequent quantitative study. Discussions were conducted with a total of 48 cassava farmers from August 31 - September 5, 2016 through 6 FGDs organised in the Volta, Ashanti and Brong Ahafo regions. Eight (8) cassava farmers for each FGD were randomly selected from a pool of farmers in the community who farm cassava as main crop, and sell to processors.

Figure 1: Locations of FGDs In Ghana

On the average 7 out of 8 participants owned a mobile phone. The phones were used mostly for making and receiving calls. However, very few (2 out of 8 participants) could use their phones for SMS text messaging. Participants noted MTN and Vodafone as the main network but MTN has the best service connection. Noticeably absent amongst the FGD participants were the other two operators, Tigo and Airtel. On mobile money use, most participants had heard of mobile money mostly through radio adverts and by word of mouth. Among the interactions with farmers, most understood that mobile money could save transportation costs. An example cited by one FGD participant elucidated the point. "Assume, your child is schooling in Tamale and he has been sent home for school fees, traditionally he has to travel home to pick up the money and vice versa, can you imagine the transportation cost involved? But mobile money has come to save this situation"; other benefits identified are that it is fast, secure and easier. Challenges identified with mobile money include;

1. low community education about usage,
2. inadequate number of mobile money agents,
3. occasional transaction delays,
4. high mobile money fees.

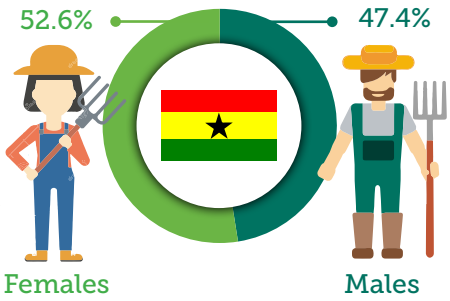
Over half of the FGD farmers mentioned they save for needs like building works, health, motor vehicles, school fees and funerals. As for the types of services, they usually pay for within the community most mentioned agricultural inputs such as chemicals as well as school fees, utility bills and daily groceries. Almost all of these payments are made with cash.

Demographic Characteristics of Cassava Farmers in Ghana

Gender

Of the total 460 farmers interviewed, 218 were males and 242 were females. The study revealed that farmers who sell their produce to processors were mostly women representing 52.6% of the sample population (Figure 2).

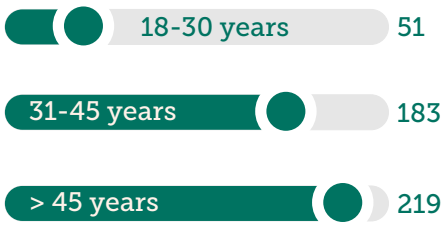
Figure 2: Gender of cassava farmers in Ghana



Age

Cultivation of cassava is a labour intensive process and therefore the age of farmers can be important. Of the 453 farmers that provided their age, the majority of respondents (47.6%) were above the age of 45 while the least predominant age group (11.3%) was the youth (18 - 30 years) as shown in Figure 3. This implies that the youth is not so involved in cassava production in Ghana. This is consistent with the findings of WAAP (2009) and Osei-Adu (2011) that the sector is dominated by the old and middle aged generation of farmers.

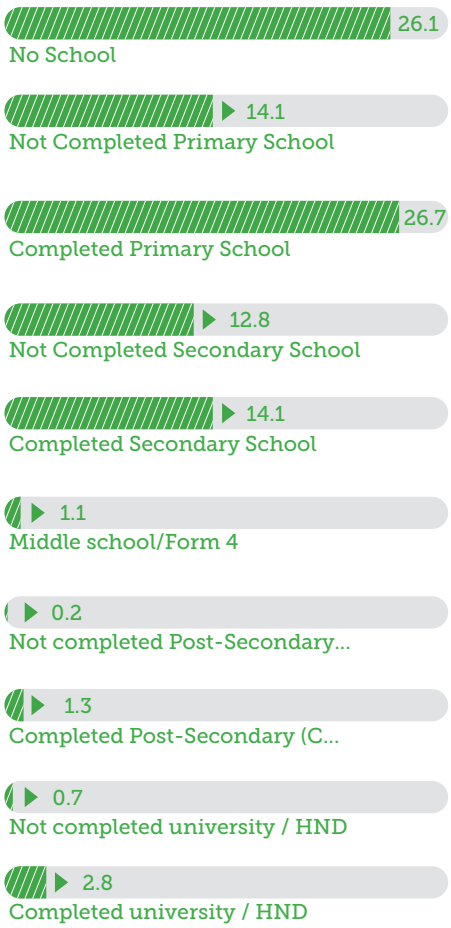
Figure 3: Age Group



Education

Education plays an important role in farmer acceptance and adoption of new technologies. Among cassava farmers surveyed there were 26.1% (120) that had no school at all and another 14.1% (65) that started but did not complete primary school. A total of 26.7% (123) completed primary school.

Figure 4: Education



Socio-economic characteristics

The household size ranged from 1 to 20 people with a mean of 6 (±2.72) people. The main source of income for most farmers is from subsistence/ small scale farming 302 (representing 65.7%) followed by 76 commercial/ large scale farmers representing 16.5%. Other income sources accounted for reminder percentage this included trading, private and public sector jobs, pension benefits, money from relatives, rent and returns on investment.

As portrayed in Figure 5 below, amongst the farmers whose main income source is from subsistence/ small scale farming, a majority (42%) reported a monthly income range between GHS 251 – 1,000 (€54 – €215) and 34% reported a range of GHS 250 (€54) or less. At both ends of the spectrum, 7% reported no income while 5% reported income that ranged between GHS 3001 – 6000 (€645 – €1290).

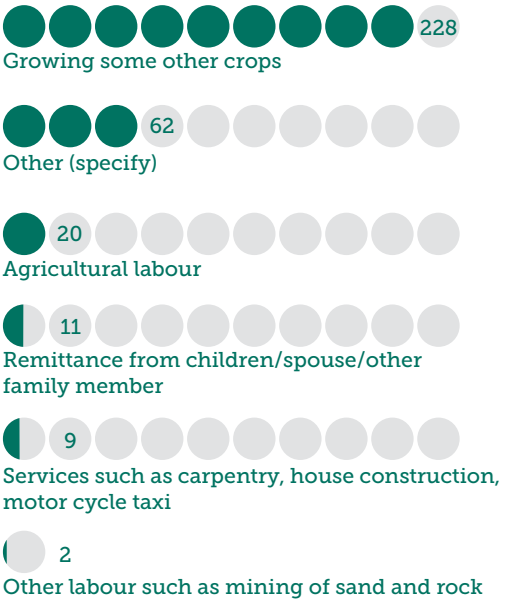


Figure 6: Other Income Sources

The status of land ownership for cassava farming activities varied widely among the farmers. The two main ownership classifications are leasing and titled family ownership as presented in Figure 7.

Figure 5: Income Ranges

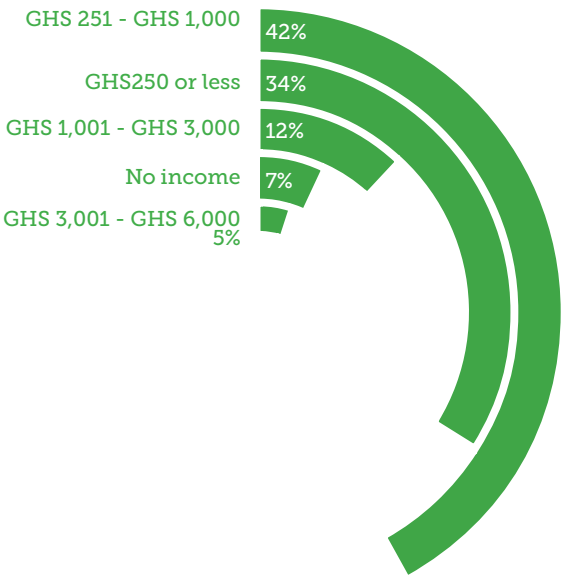
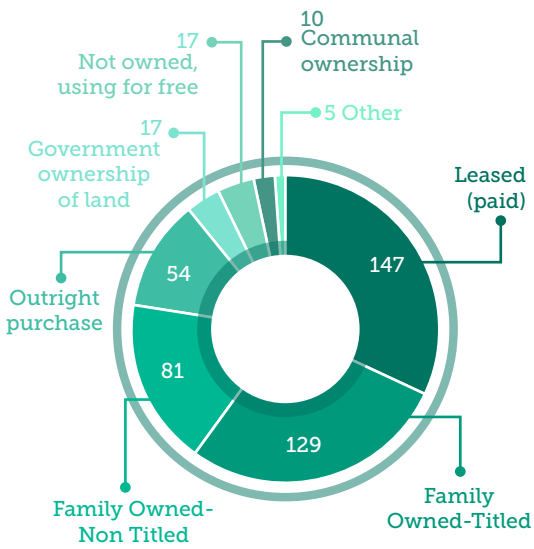


Figure 7: Status of Lands Used in Cassava Farming



Production and Marketing Cash flows of cassava farmers

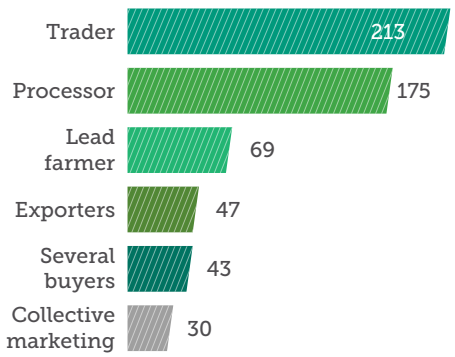
Production outputs

The study shows that in addition to cassava production, farmers cultivate other crops such as (in order of frequency); maize, plantain, vegetables, yam, leguminous plants, cocoyam and cocoa. This mixed cropping approach increases the resilience of farmers to cope and smooth out their incomes when production from any one or more crops decline or fail.

Main Customers

The study revealed that most of the cassava farmers sell their produce to traders (213 representing 46.3%), processors (175 representing 38.0%), exporters (47 representing 10.2%) and to their lead farmers (69 representing 15.0%) show in figure 8 below. Adade Gari Processors, Caltech Ventures Limited, Josema Gari Processing, Krobo Gari Processors were among the listed processors to which the farmers sell. Finally, as for traders the main buyers are Green Acres Farm, poultry farmers, market women (especially from Mampong and Kumasi cities), Agricfo, chop bars and fufu sellers[1] .

Figure 8: Main Buyers of Cassava



[1] *Chop bar and Fufu sellers – operators of canteen like business*

Sales and Payment outlets

The majority (90%) of farmers receive sales payment twice a year while the remaining 10% get paid only once in a year. Seventy-six percent (76%) of the farmers make sales individually while only 8% do so through a farmer co-operative. Two hundred and seventy-seven (277) farmers representing 60.2% negotiate the sale at their homes whiles 169 farmers representing 36.7% sell their cassava tubers on the farm (see figure 8). The overwhelming majority of farmers (91.5%) receive payment in cash, 8.3% receive payments in cheque and 0.3% via bank transfer as shown in figure 10.

Figure 9: Location of Sales Transactions

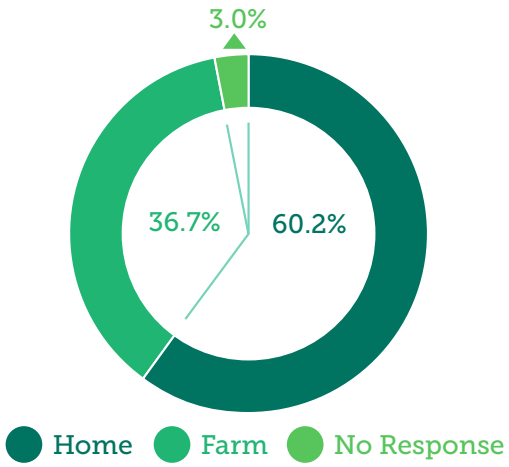
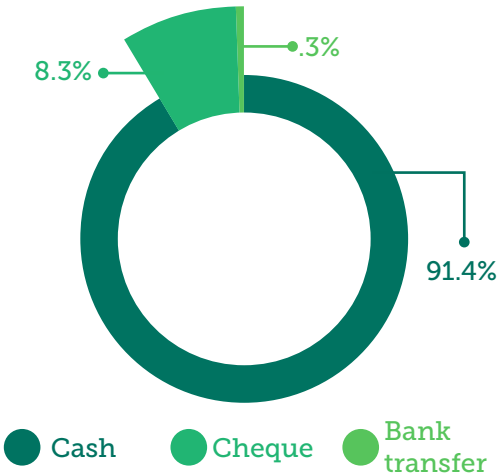


Figure 10: Payment Modes for Sale of Cassava



Mobile Phone Usage

Mobile phone ownership

As much as 83.0% of the cassava farmers owned mobile phones. Mobile phones have become a common tool for most smallholders and are no longer regarded as a luxury but as a necessity on the farm as a cost-effective means of communication. Interestingly, more women farmers surveyed (205) own mobile phone as compared to 177 male farmers (figure 11). A recent study by World Cocoa Foundation in 2015 revealed a high mobile phone ownership rate of 87% among cocoa farmers in Ghana, but recorded contrary results with regards to mobile phone ownership rates in gender terms.

Figure 11: Ownership of Mobile Phones among Cassava Farmers

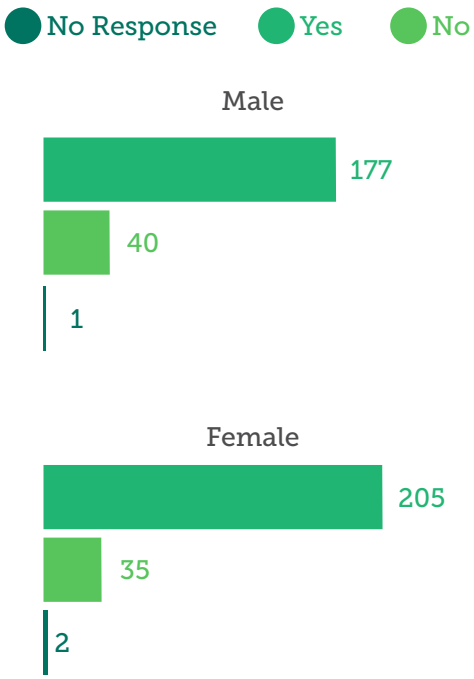
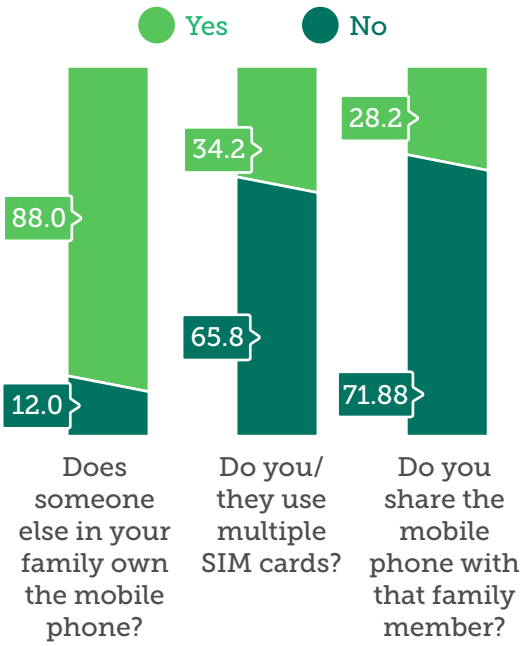


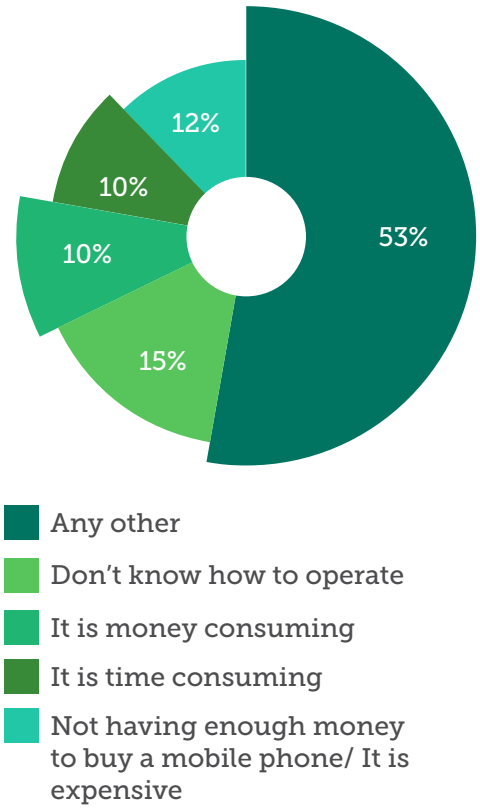
Figure 12 below shows that 88.0% of the farmers have a family member who owns a mobile phone. This seems to explain why 71.8% of farmers do not share their mobile phone with other family members. The study also revealed that one in every three farmers (34.2%) have multiple SIM cards.

Figure 12: Other Ownership and Sharing of Mobile Phone



In addition to 88% of farming households owning more than one phone, when asked why they do not share their mobile phone with family members, 53% indicated other reasons most of which are personal. This lends some credence to the fact that the mobile phone is a very personal device. Fifteen percent (15%) indicated lack of knowledge within the household about operation of a phone while 12% said replacing a phone is expensive and 10% said airtime charges are expensive as shown in figure 13.

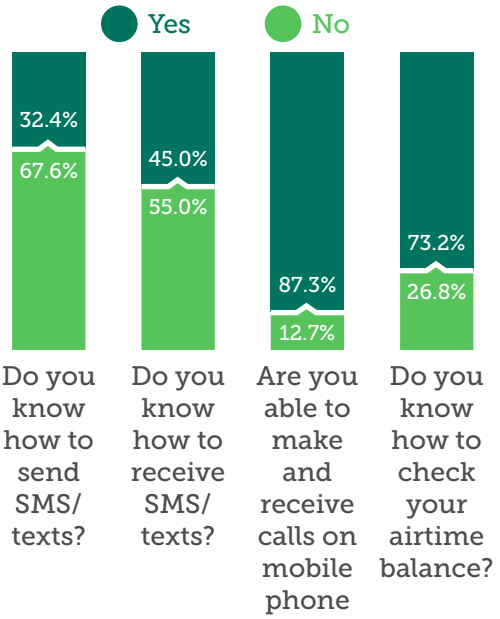
Figure 13: Reasons farmers do not share their mobile phone with family members



Uses of Mobile Phones

The survey revealed that on average, farmers spent about 25.0GHS (€5.4) on airtime purchases monthly. Other than airtime sellers, the most common place for airtime purchase is the neighborhood grocery/corner store. Figure 14 shows that 87.3% of the surveyed farmers indicated their ability to use the mobile phone to make and receive calls, 73.2% can use their phones to check airtime balance as against 55.0% and 67.6% who do not know how to receive and send SMS/ text respectively. This observation holds true given that the latter use cases of the mobile phone entail functionalities that require levels of literacy that the majority of farmers do not have because most completed little or no primary education, as previously shown in figure 4.

Figure 14: Usage of mobile phone for SMS/text, voice calls and check airtime balance



Of the total farmers, only 65 representing 14.1% responded yes to having access to internet on their mobile phones. Out of this number, only 45 farmers representing 9.8% know how to operate internet on their mobile phones.

In Figure 15, 71.1% of farmers expressed willingness to use their mobile phone for transactions like bill payments, money transfer/remittance purchase airtime, and loan repayment among others. The top three benefits of using a mobile phone for such type of financial transactions identified by farmers include: saves time/convenient, saves transport cost and faster transactions. On the other hand, the top three challenges observed by farmers are: low technical know-how on how to operate/use a mobile phone, downtime of transactions and high risk of phone loss/theft.

Mobile network operators/ mobile phone service providers

More than half (47.8%) of the cassava farmers, representing 220 farmers, use MTN, followed by Vodafone 26.1% representing 120 farmers, Tigo 8.5% representing 39 and Airtel 4.6% representing 21 farmers. While this contrasts with the 48 FGD participants that only had MTN and/or Vodafone, this survey of 460 farmers more closely reflects Ghana's broader mobile telecom landscape. In addition, the majority of the 460 farmers had multiple SIM cards in the following combinations; MTN/Vodafone or MTN/ Tigo.

Figure 15: Willingness to use mobile phone for financial transactions like bill payments, money transfer/ remittances, purchase airtime and loan repayment

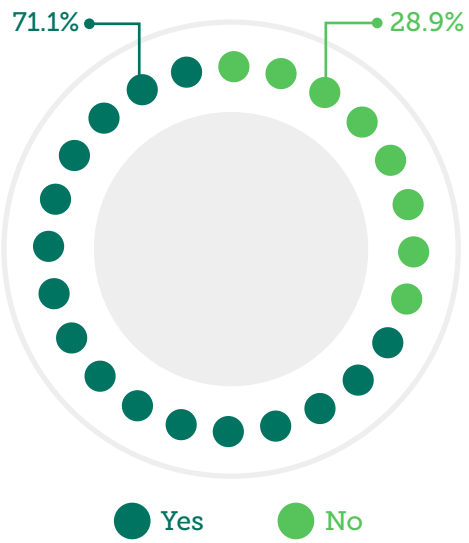
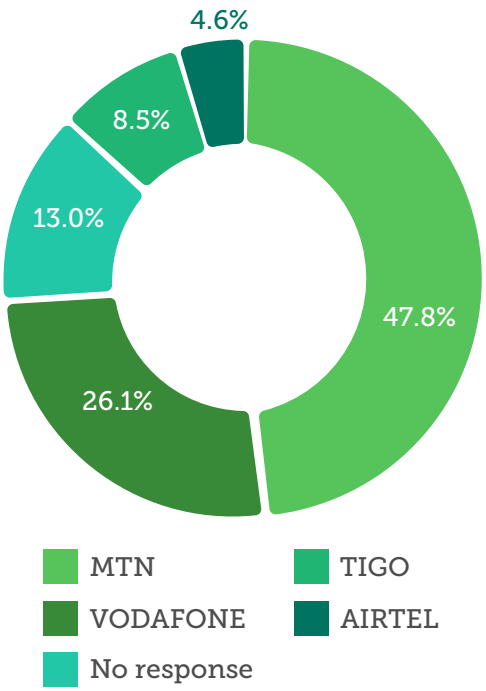
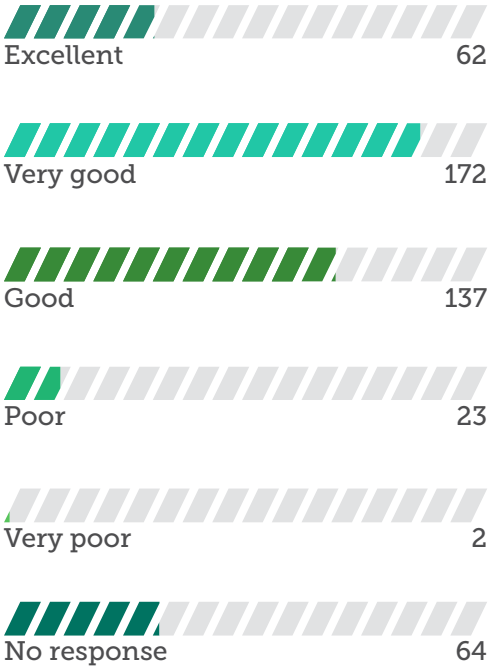


Figure 16: Mobile Network Operators used by Cassava Farmers



Responding to the question about the service reliability of mobile network operators, the majority (80%) of farmers interviewed generally rated the mobile network operator's service to be at least good as shown in figure 17 below.

Figure 17: How reliable is the service from your mobile network operator?



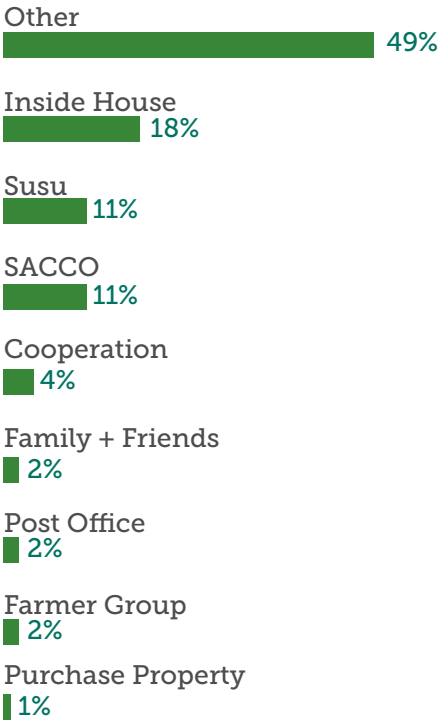
Financial Behaviour of Cassava Farmers in Ghana

Savings among cassava farmers

The majority of respondents representing 52.6% (242) save their incomes through traditional methods whiles 216 farmers interviewed representing 47.0% save money with some financial institutions.

Some of the traditional means of saving among cassava farmers include keeping money in the house (under pillows, in cupboards, etc.), Susu[2] collectors and Savings and Credit Cooperative while a few others save with their relatives or friends or farmer groups (see figure 18). A very small proportion of the cassava farmers (1%) actually save by purchasing property (livestock, gold) or other household assets.

Figure 18: Informal Savings Channel



[2] *Susu is an informal means of collecting and saving money through a savings club or partnership, practiced throughout Africa and the Caribbean*

The main reasons farmers save is to; pay school fees for their children, buy farm and agriculture inputs or do farm maintenance and meet emergencies (health, funerals, natural calamities, etc.) as shown in Figure 19. On the other hand, as portrayed in Figure 20, for those farmers who do not save their reasons were that; they had no money; financial institutions are too far away and expensive and they do not have the requisite documentation to open an account at a financial institution. In addition, there were eight (8) farmers who stated that they do not trust financial institutions.

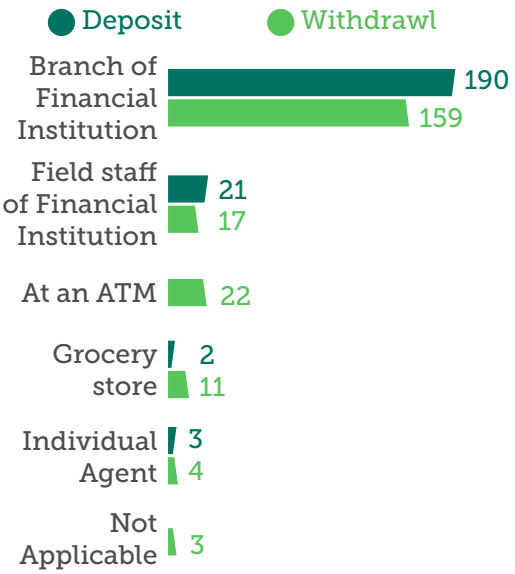
Figure 19: Why do you save money?

Figure 20: Why don't you have a savings account with a financial institution?

Financial transactions by farmers

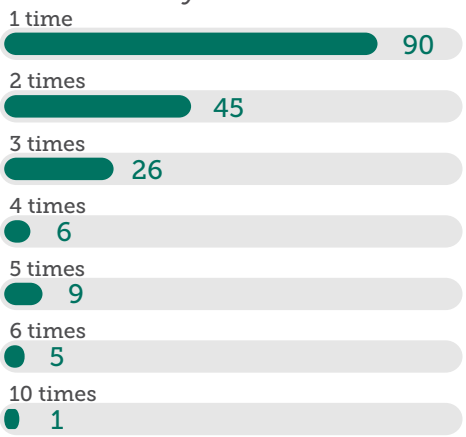
The main transactions made by cassava farmers who keep their monies in financial institutions include cash deposits, cash withdrawals, while others receive salary / payments from buyers, receive benefits and insurance.

Figure 21: Avenues where cassava farmers make deposit and withdrawal transactions



Majority of farmers interviewed reported depositing money into their account 1 to 3 times every six months. Very few farmers reported depositing money at least 4 times as shown in the figure 22.

Figure 22: How often do you deposit money in your account in every six months?



Mobile Money in the Cassava Value Chain of Ghana

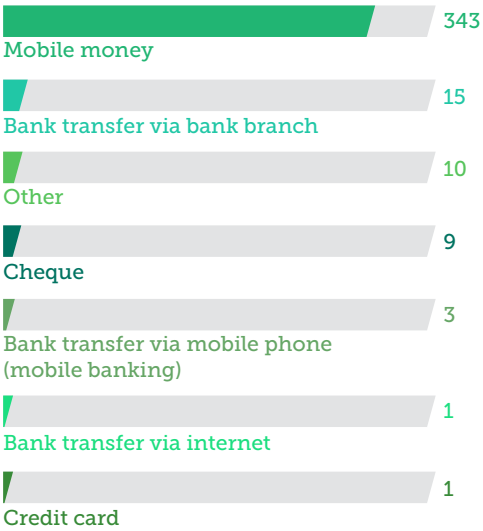
Farmer awareness of e payment methods

4.8% (22 of 460) of farmers interviewed had never heard of any of the e-payment methods. Of the rest, majority (369 of 460) representing 80.2% have heard of mobile money, bank transfer via mobile phone or branch (52 of 460) and cheque (81 of 460), Other e-payments methods/ technologies like Paypal, credit card, prepaid card, point of sale machine, bank transfer and online payments were relatively less known to the farmers. Most farmers interviewed mentioned radio, word of mouth and television as the main means through which they heard of the mobile money e-payment methods.

E-payment methods you have used most frequently

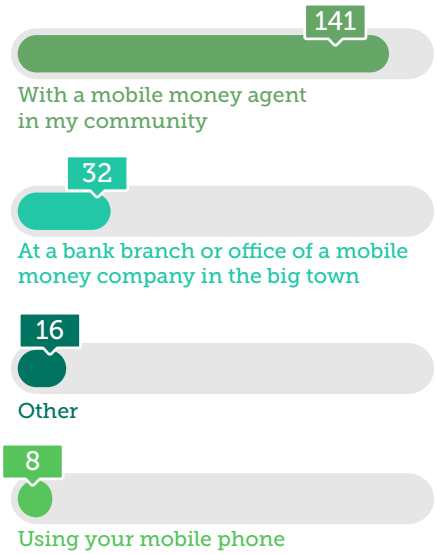
Among the e-payment methods farmers have used most frequently, Mobile money recorded highest (343 of 460) representing 74.6%, followed by bank transfer via bank branch (15), cheque (9) and other (10) as shown in figure 23.

Figure 23: E-payment method used most frequently by cassava farmers in Ghana



Majority of farmers 30.7% (141 of 460) registered for mobile money in their communities through a mobile money agent. The next most common location for mobile money registration is at a bank branch or mobile operator's office in a big town (32 of 460), as shown in figure 24.

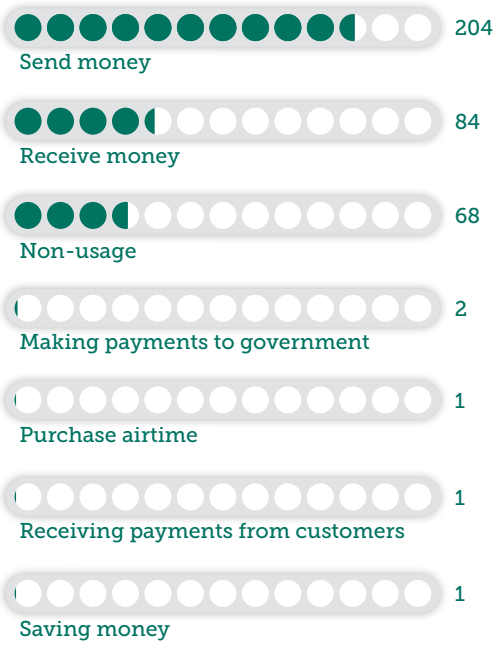
Figure 24: How did you register on to use mobile money?



Farmer usage of mobile money

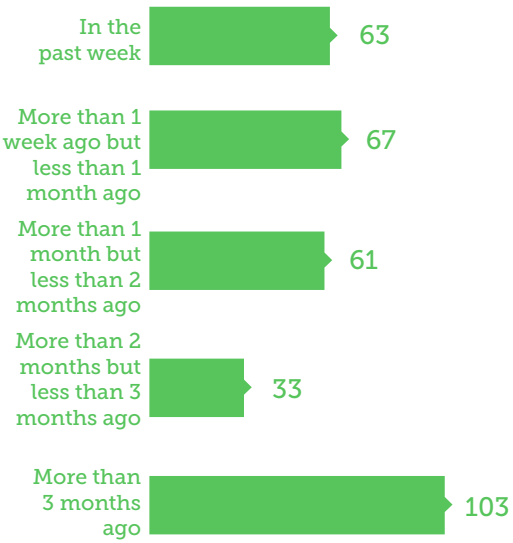
The cassava farmers that use mobile money do so primarily for sending and receiving money. A few others save on the service, receive payments from customers and purchase airtime as opposed to 68 farmers (14.8%) who do not use mobile money for any reason. 204 representing majority (44.3%) of the farmers interviewed use mobile money to send money whiles 84 (18.3%) used it to receive money.

Figure 25: Usage and non-usage of mobile money by cassava farmers



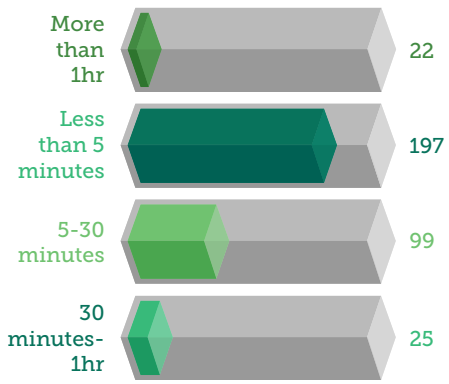
In terms of branded mobile wallet usage for sending and receiving, farmers interviewed mentioned MTN (220 representing 47.8%), Vodafone (40 representing 8.7%), Tigo (21 representing 4.6%) and Airtel (15 representing 3.3%). The majority (130 farmers) used mobile money for some financial transaction within the past month, followed by 103 farmers who used the service more than 3 months ago for transaction. Ninety four (94) farmers used the services more than 1 month but less than 3 months for transaction.

Figure 26: Frequency of mobile money use



Of the 343 farmers that use mobile money most frequently, the majority of farmers (57.4%) can reach a cash-in/cash-out agent in less than five minutes. Another 28.9% (99 farmers) can reach an agent within five to 30 minutes.

Figure 27: How long does it take you to locate a service point (the place where you do the cash deposit and cash withdrawal transactions)?



According to the farmers their three top reasons for using mobile money are; easily available/accessible, convenient and secure.

Figure 28 reveals the monthly outflows for farmers. The data shows that education, food, agricultural inputs and electricity rank are the largest expenses. About 70% of farmers (321) pay for these expenses in cash. Meanwhile Figure 29 reveals that 61.1% of the expenses are incurred monthly and 21.4% is incurred on a daily basis.

Figure 28: What are your largest expenses/cash outflows in a month?

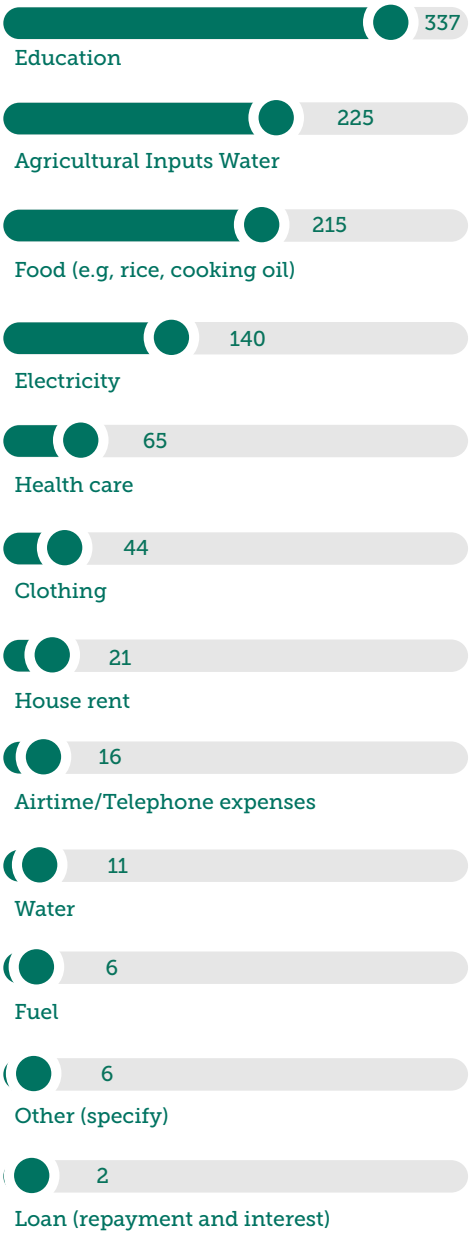


Figure 29: How often do you pay for the expenses?

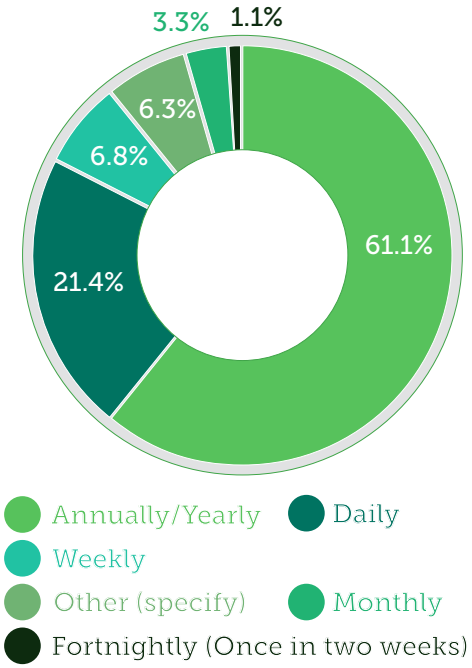
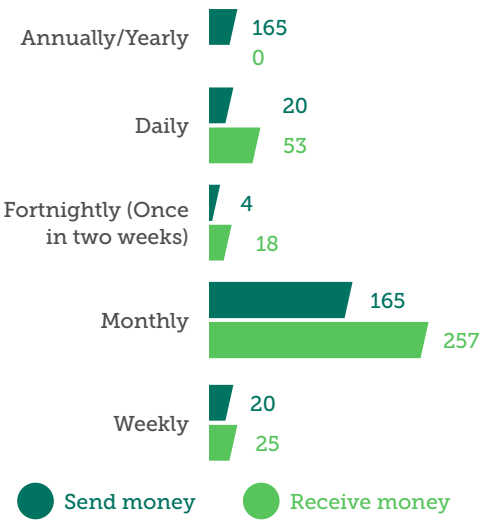


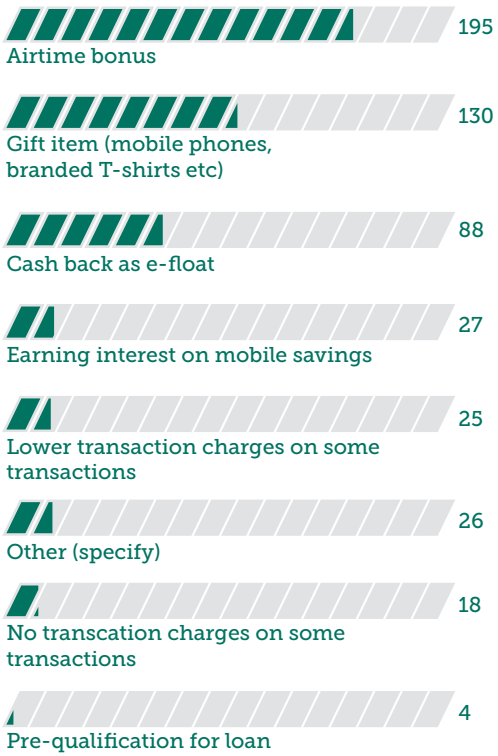
Figure 30, reveals that the majority of mobile money sending and receiving occurs once a month. Further, most of those once a month transactions are to receive money. The average that most farmers send is GHS100 (€21.5) and the average they receive is GHS200 (€43).

Figure 30: How often do you receive/send month?



As regards incentives to promote mobile money usage, Figure 31 reveals that farmers prefer airtime bonuses as well as gift items such as mobile phones, branded t-shirts and cash back e-float.

Figure 31: What type of incentives would be most useful in encouraging you to use mobile money?



Chapter 4: Research Results in Nigeria

Key Informant Interviews and Secondary Data Collection

Mobile money in Nigeria began seven years ago but unlike Ghana and most of the rest of Africa it is not led by the mobile network operators (MNOs). Nigeria is the largest country in Africa and the financial exclusion of the rural population is of significant policy concern. In pursuit of the financial inclusionary benefits of mobile money the Central Bank has licensed 21+ mobile money operators (MMOs) that can be either banks or other third party providers. Unfortunately, mobile money uptake, in urban as well as in rural areas, has been modest. This is believed to be because MNOs have confined their operations to the same urban customer base served by banks. Many believe the Central Bank's departure from the MNO-led model does not leverage the potential of the MNOs nationwide customer base.

While mobile money has had slow uptake to date given the size of the country and its significant diaspora population there are some compelling dynamics that indicate there will soon be mobile money uptake. Nigeria is the 5th largest receiver of remittances globally (Chinedu, 2017) which amounts to US$21 billion (€19.4 billion) annually (Wall Street Journal, 2015). Mobile money international remittances reduce the cost of traditional money transfer (Western Union, MoneyGram, etc.) by more than 50% (GSMA, 2016).

According to the Vice Chairman of the Nigerian Communications Commission there needs to be "a mobile money kiosk located in every street especially in rural areas where the need is the greatest" (Ezeh, 2016). This study considers the potential for mobile money uptake in the cassava value chain for which there is some room for optimism.

The experience in other countries is that mobile money traction has taken hold by year seven and momentum accelerates thereafter. There also remains genuine interest by the government in increasing financial inclusion. Meanwhile, locally produced food is cheaper and populations worldwide are embracing healthier, organic diets. Finally, the Federal Ministry of Agriculture and Rural Development has pursued a number of initiatives that use ICTs and other mobile solutions. The MMO Cellulant has provided eWallets for Nigeria's fertilizer subsidy disbursement programme. They enrolled 14.5M farmers. Farmer productivity increased from US$100 (€92.6) in 2011 to US$1,800 (€1,666) in 2014 (East Africa Venture Capital Association, n.d.)

Observations From Focus Group Discussions

Figure 32 reveals the locations of FGDs. Observations of those FGDs have been selectively integrated throughout the following narrative.

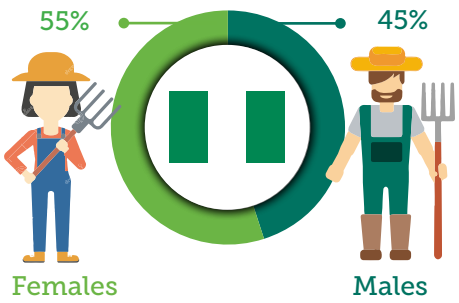
Figure 32: Locations of FGDs in Nigeria

Demographic Characteristics of Cassava Farmers in Nigeria

Gender

Of the 449 farmers surveyed there were 202 (45%) males and 247 (55%) females.

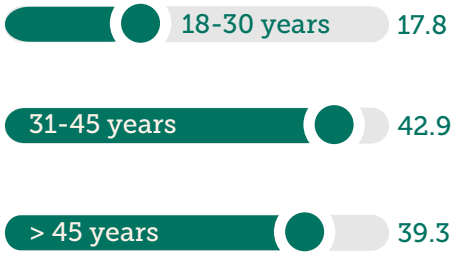
Figure 33: Gender of Cassava Farmers in Nigeria



Age

As shown in Figure 34, the middle age group (31-45 years) had the largest population of 192 farmers (42.9%) closely followed by the 45+ age group with 176 farmers (39.3%). The young adult population (18-30 years) was a distant 17.8% with only 81 farmers.

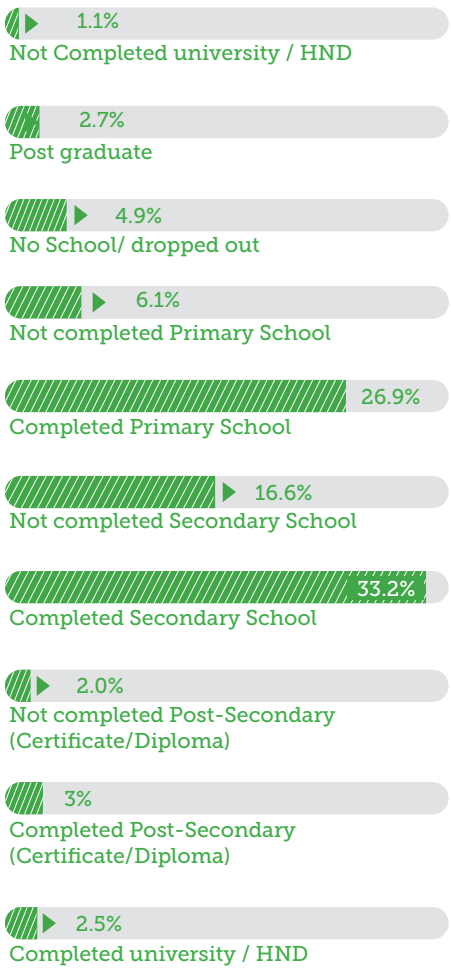
Figure 34: Age Group



Education

Amongst the cassava farmers 62.1% (279) have exceeded a level of education beyond primary school. This indicates a level of literacy amongst the farmer population that bodes well for the potential uptake of mobile crop payments given that illiteracy is a key barrier.

Figure 35: Education



As seen from the FGDs, the range of other sources of income are varied;

"I am into tailoring and have a barbing saloon which I go to when there is no farm work to be done..."
Male, 31 – 45 years

"I do carpentry work by the side"...
Male: 45years+

"Actually if you are depending on only one income, you will not make it. I do business because it brings me money before the salary comes to solve little expenses" "I run a chemist (pharmacy) shop to help my family..."
Female, 18 – 30 years

"If you depend on just one job you would be in trouble, so even though I am a government worker, I still maintain my farm. I have children and the cost of looking after them is high."...
Male, 45 years+

"I have a grocery shop where I sell basic household needs and food items"...
Female 18-30 years

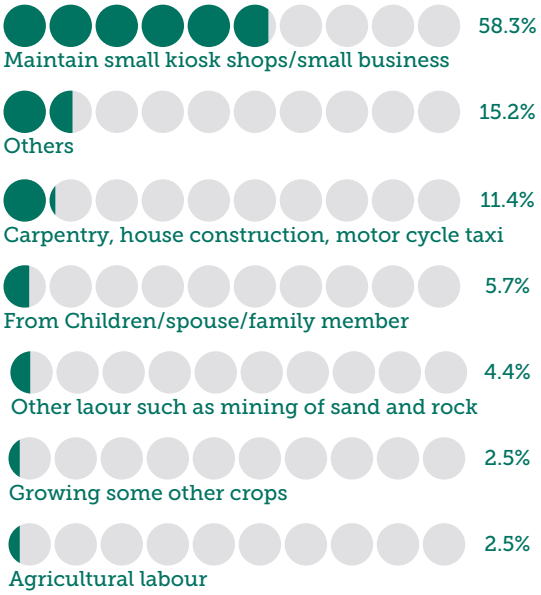
Socio-Economic Characteristics

Consistent with the National Population Commission statistics on average household size in Nigeria the average cassava farming household size is five (5). Twenty percent (20%), or 89, of the cassava farming households have 10-20 inhabitants. In most of these cases the inhabitants include farm laborers and other workers who also reside in the household. These large households also present high cash payment streams that can be migrated to mobile payments.

The overwhelming majority (440 or 98.1%) are subsistence farmers with the balance being commercial/large scale farmers. Across all age groups, respondents are engaged in a range of other occupations in both formal and informal sectors. The majority of respondents are engaged in more than one income-generating activity. There were 397 farmers (88.6%) that earned N60,000 (€174) or less per month. This is income from all farm and off-farm sources.

Of the population of farmers that had more than one source of income, 58.3% of them maintained a kiosk for petty trading.

Figure 37: Income Sources



Whether titled or non-titled 66.7% (299) of the farms are family owned followed by 25.9% (116) of the farms that are leased.

Figure 36: Income Ranges

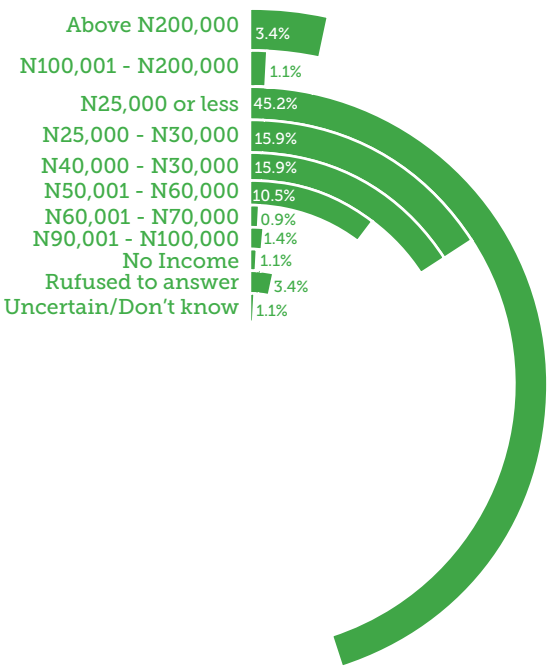
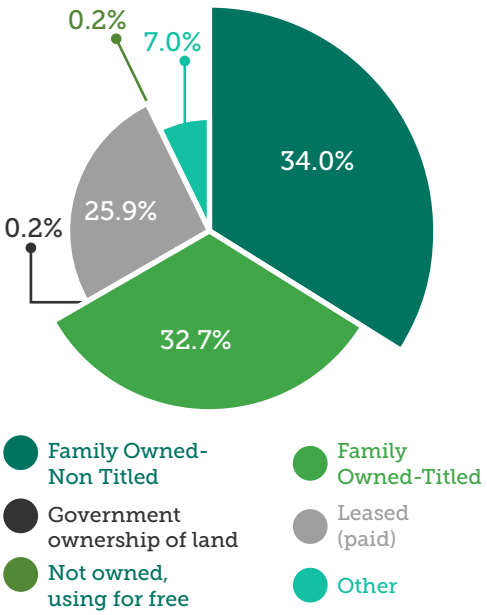


Figure 38: Farm Ownership Structure

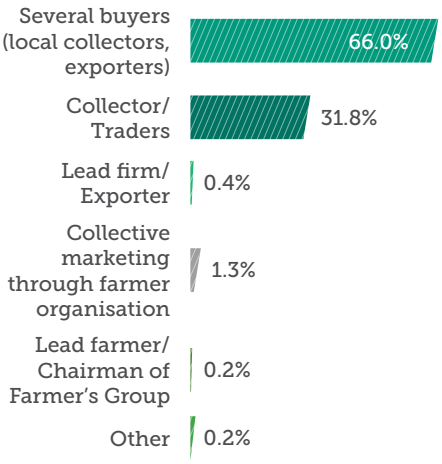


Production and Marketing Cash flows of Cassava Farmers

Production Output

The study shows there is very little agriculture production beyond that of cassava. Without the risk diversification of other crop production farmers seem to have maximum exposure to lower than expected cassava quantity and/or quality. Farmers, instead, seem to have partially mitigated such risk with other sources of non-farm income such as, primarily, retail kiosks.

Figure 39: Main Buyers of Cassava



MAIN CUSTOMERS

The majority (296 or 66%) of farmers sell to local collector and export buyers. Another 142 (31.8%) farmers sell to major collectors/traders. There seems to be no established market relationships because farmers sell to whatever buyers that happen to patronize their community at harvest time. In addition, prices are individually negotiated for each transaction which likely occurs in the context of market price information asymmetry between the buyer and seller. This fragmented nature of cassava marketing can be a challenge for promoting uptake of mobile payments by one or more buyers to individual farmers. Nevertheless, an innovative buyer(s) can secure strategic advantage by embracing the potential of mobile money/solutions to streamline their supply chain management.

SALES AND PAYMENT OUTLETS

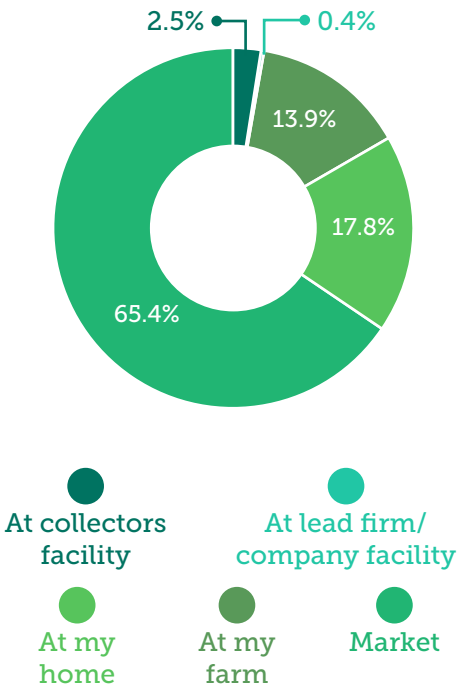
On average farmers sell their cassava and other farm produce at least 1.6 times per month (19 times/year). All (100%) payments for farm produce are made in cash. Those farmers that produce only cassava have markedly fewer transactions per year.

This robust volume of farming household income presents additional value proposition for the integration of a cassava mobile payments scheme.

SALES LOCATION FOR FARM PRODUCE

The majority of farmers (293 or 65.4%) sell their produce at the local marketplace. Seventy-nine farmers (17.8%) and another 62 farmers (13.9%) negotiate pricing and sell their produce at their home and their farm, respectively.

Figure 40: Location of Sales Transactions



Feedback from the FGDs include

"For me now, if I don't harvest my cassava, I will harvest maize/ corn"...
Male, 45Years+

"During rainy season, I harvest and sell my vegetables almost every 2 weeks"...
Female, 31-45years

Mobile Phone Usage

Mobile Phone Ownership

A significant majority (430 or 95.8%) of the 449 farmers surveyed own a mobile phone. Of these farmers 229 (53.3%) are women and 201 (46.7%) are men. A contributing factor to this high rate of mobile phone ownership might be the high rate of literacy indicated by the 62.1% of farmers that have completed a level of education beyond primary school. This high rate of mobile phone ownership (and literacy) bodes well for potential mobile money uptake within the cassava value chain.

Figure 41: Ownership of mobile phones among cassava farmers

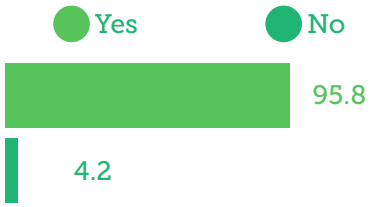
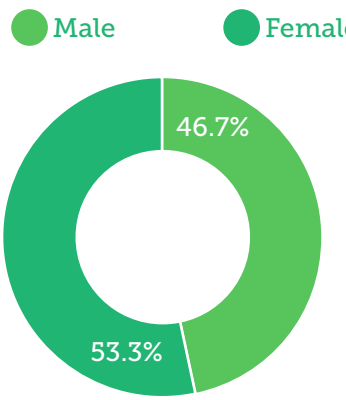


Figure 42: Mobile phone gender ownership



Uses of Mobile Phones

While the primary purpose of the mobile phone is for voice communication, about 68% (292) of the farmers that owned a phone know how to receive an sms/text message. Further, only 57.9% (249) of farmers know the more complicated keystrokes necessary to not only receive but also to send sms/text messages.

Figure 43: Can send/receive SMS text messages

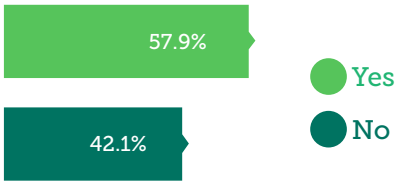
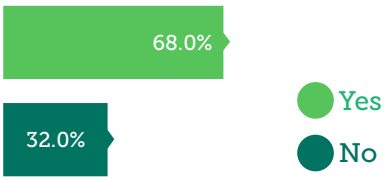


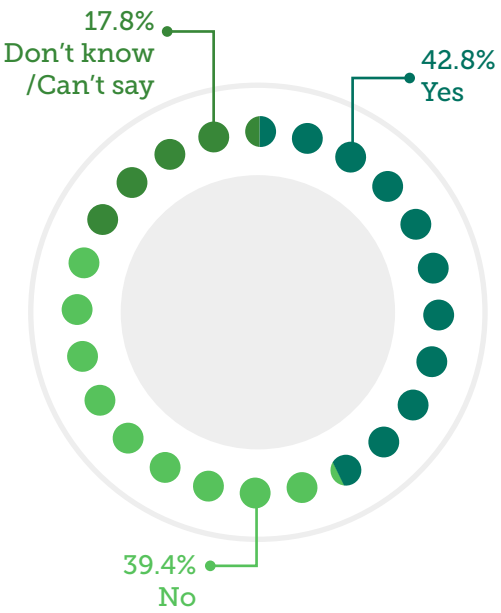
Figure 44: Can only receive SMS text messages



A total of 192 farmers (42.8%) expressed willingness to use their mobile phone for financial transactions. This included the potential of receiving mobile payments for the sale of their cassava as well as sending/receiving money for other purposes such as making bill payments. This rate is lower compared to this study's finding in Ghana of 71.1% which might be due to the lower levels of mobile money uptake and trust in financial service providers in Nigeria.

Some other mobile phone services that farmers would consider include receiving information about market pricing, availability of fertilizer and harvest timing. An innovative cassava buyer can leverage the interest of farmers for mobile phone information into greater willingness by farmers to receive mobile crop payments.

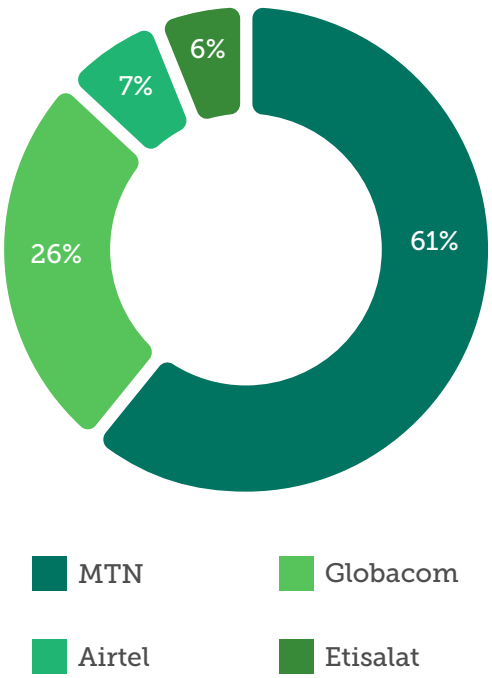
Figure 45: Willingness to use mobile phone for financial transactions like bill payments, money transfer/ remittances, purchase airtime and loan repayment



Mobile Network Operators/ Mobile Phone Service Providers

The mobile network operator MTN serves 61% (274) of the farmers. The next most prominent MNO is Globacom that serves 26% (116) of farmers. Farmers typically use multiple SIM cards but MTN is perceived to have the higher quality network service.

Figure 46: Mobile network operators (MNOs) used by cassava farmers



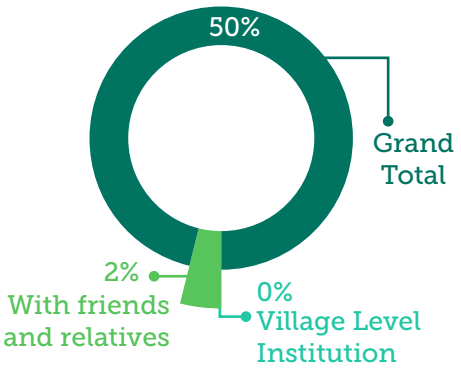
Financial Behavior of Cassava Farmers in Nigeria

Savings Among Cassava Farmers

The practice of saving is a well-developed discipline among cassava farmers in Nigeria. A total of 375 (83.4%) farmers save money formally with financial institutions and/or informally through traditional means (home, groups, collectors/agents). As stated by a young FGD participant "anyone that has a vision will save" (female, 18-30 years). As portrayed during FGDs their savings habits enable them to achieve four types of objectives; parental responsibilities, control spending, new/ existing investments and increased self-confidence/security. Some selected FGD quotes include:

- "Parents therefore save to build houses and for their children's education"...Male, 45years +
- "Saving (especially for a pre-determined goal) is considered necessary to curb excessive spending, thus ensuring financial discipline".... Female, 31 – 45years
- "Saved funds can be invested in new business opportunities or ploughed into existing ones for further expansion"...Male, 31-45years
- "Having some savings gives some level of self-confidence and sense of security"...Male, 18 -30years

Figure 47: Farmers who save whether formally and/or informally



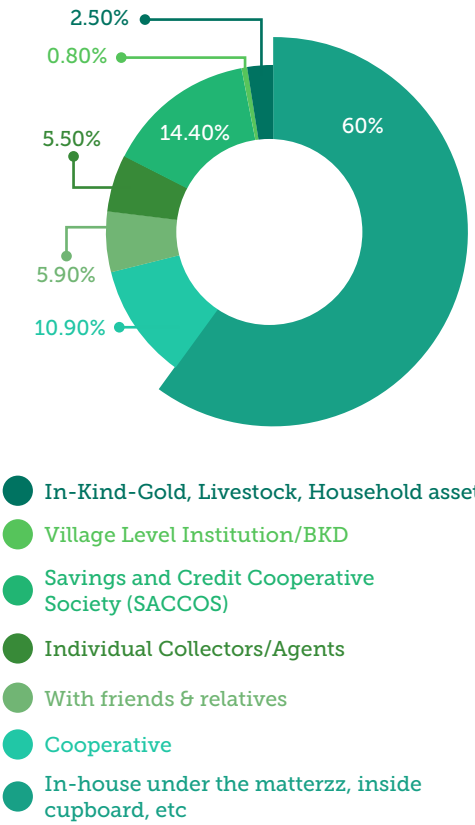
Of the 375 farmers who save formally and/or informally 51% (191) of them save with a formal financial institution. During the FGDs it was revealed that those who save with a financial institution do so because it is safe and they earn interest. It also makes them eligible for loans. As stated by one FGD participant;

- "For safe keeping of our money. And to earn interest"...Female, 31 – 45 years

Figure 48: Farmers who save with a financial institution

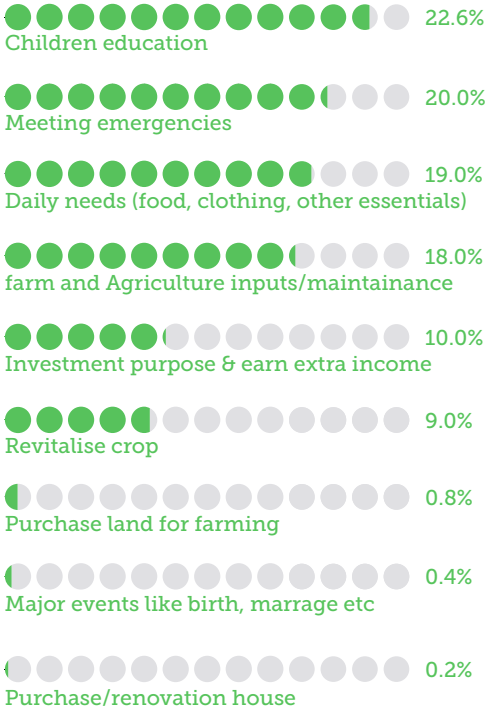
As previously stated, there are 375 farmers who save formally and/ or informally. Of these 375 farmers there are 184 farmers (49%) who only save informally. As portrayed by Figure 49, 110 of these farmers (60%) primarily save in/around their house (i.e. under mattress, inside cupboard). This is most prominently followed by savings channels with SACCOs (14.4%) and cooperatives (10.9%). SACCO and cooperative saving deposits are made on a daily, weekly or monthly basis within a group savings/lending context. Deposits are also made with collectors/agents (5.5%) that visit the household on a daily or weekly basis and returned to the saver after a period of time less the agreed upon fee to the agent.

Figure 49: Informal savings channels



For 101 farmers (22.6%) saving for their children's education ranked as their highest savings priority. For 81 farmers (18%) saving for their agriculture inputs/farm maintenance was their highest priority excluding another 40 farmers (9%) that saved primarily to revitalize crops. Saving for daily needs and for emergencies ranked as the highest priority for 85 (19%) and for 90 farmers (20%), respectively.

Figure 50: Why do you save money?



As stated previously there are 74 farmers that do not save at all and another 184 farmers that save but not with financial institutions. This total of 258 farmers (57.5%) were surveyed as to the reasons why they do not save with a financial institution (Figure 51). The most significant reason cited by 30% of those farmers was they did not have enough money to save.

The most significant reason for 21% of farmers was they do not have the requisite documentation to open an account followed by 16% of farmers who felt the bank fees were too expensive.

Figure 51: Why don't you have a savings account with a financial institution.

Some of the reasons for not saving with a financial institution were echoed by the FGD participants;

- "I don't have enough money; I can't travel the distance just to drop N1000 (€3)."...Male, 31-45 years
- "It is either you have a problem with the ATM or the queue."...Female, 18 – 30 years
- "On several occasions my friend will tell me no network today at the bank and throughout that day he will not get his money." ...Male, 18 – 30years
- "Another reason is this, there was a time my brother send money through that I should go and collect, they refused me and he was given one week to pay his wife bride price or else they will give her hand in marriage to another person, they said that the money has not reflected in their system."... Male, 30 – 45 years
- "To me, honestly I don't have all those requirements to open account."...Female, 45years+"If you have a savings account with them no matter how long the money is with them they don't increase anything on the money..." Male, 31 - 45 years
- "When someone sends N1,000 (€3) you could only get N500 (€1.5) from it. The bank retains N500 (€1.5) and I don't like it."...Female, 18 – 30 years

Figure 52: For banked farmers, primary means for making deposits and withdrawals

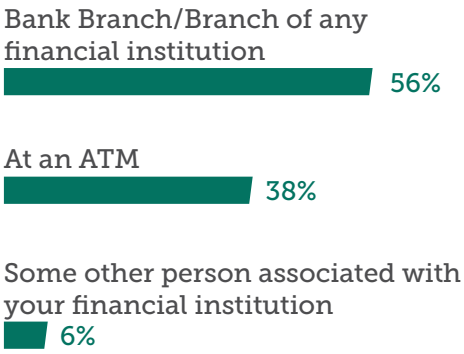


Figure 53 reveals 33.7% of the banked farmers (65) make five or more deposits in a six-month period of time. Figure 54 reveals that 50.9% of farmers (97) make no withdrawals in a six-month period of time. A comparison of Figures 53 and 54 aligns with the overall savings culture amongst cassava farmers previously mentioned. This robust savings culture, both formally and informally, can be a core aspect of a designed mobile crop payment intervention.

Figure 53: Frequency of deposits in a six month period

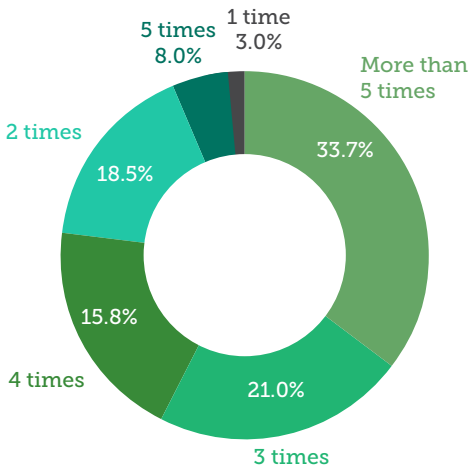
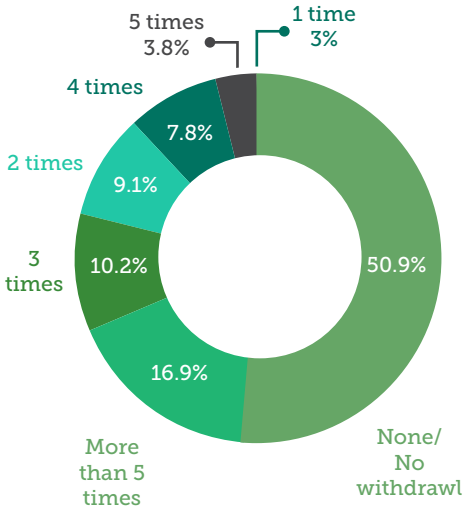


Figure 54: Frequency of withdrawals in a six month period



Mobile Money in Cassava Value Chain in Nigeria

Farmer awareness of mobile money

There are 175 (39%) farmers that are aware of mobile money. This awareness has been primarily driven by the 4% (18) of farmers that have a mobile money/ bank account. A designed mobile crop payments intervention might consider the strategic import of leveraging these 4% 'early adopters' to further promote awareness and uptake. Some mobile money/banking services/apps that are familiar to cassava farmers include; PagaTech, Cellulant, FirstMonie (by First Bank), GTMobile Money (by GTBank) and Pocketmoni (by eTransact).

Figure 55: Farmers awareness of mobile money

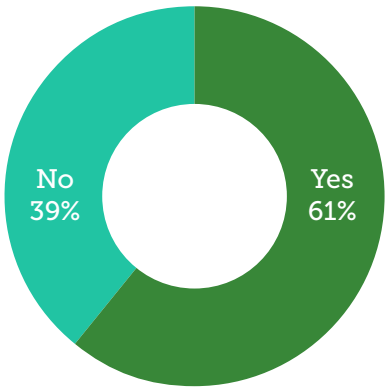
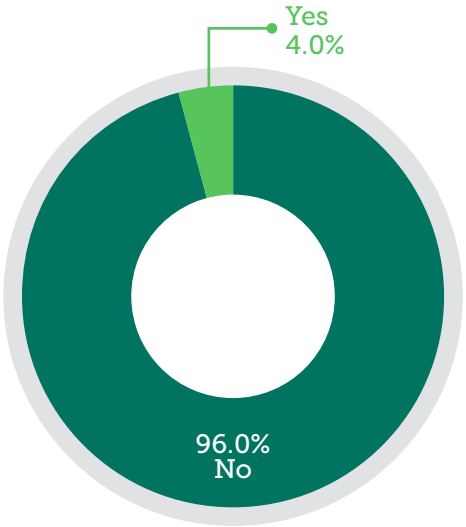


Figure 56: Farmers that have used mobile money



During FGDs participants thought the concept of sending and receiving money through the mobile phone would have the following benefits;

- Convenient – transactions can be easily done in home without going to the ATM or bank
- Personal Safety – no more need to carry large sums of cash at harvest or other times
- Privacy – others can no longer see transactions
- New Uses – can be used to receive crop payments and pay bills

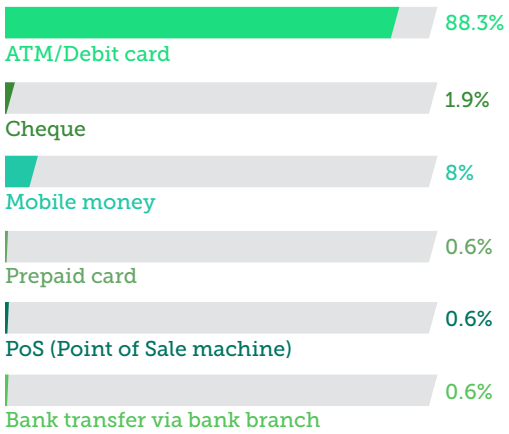
Amongst those farmers (220) that have used a non-cash transactional channel of any kind, the usage of mobile money is 8%. The most heavily used non-cash transactional channel is ATM (88.3%) which indicates a high density of ATM machines.

Non-Cash Transactional Channels Used by Cassava Farmers in Nigeria

As mentioned above only 18 farmers (4%) have used mobile money. Amongst those 18 the three services they have used include; MTN Mobile Money (in partnership with GTBank), PocketMoni (by eTransact in partnership with Airtel) and PagaTech (in partnership with EcoBank). According to one FGD participant;

- "....I know it (MTN Mobile Money). I have used it before. You can receive and transfer money through your phone.....you go to (the bank) and they register you and you will deposit in (your) mobile account...." Male, 31 – 45 years

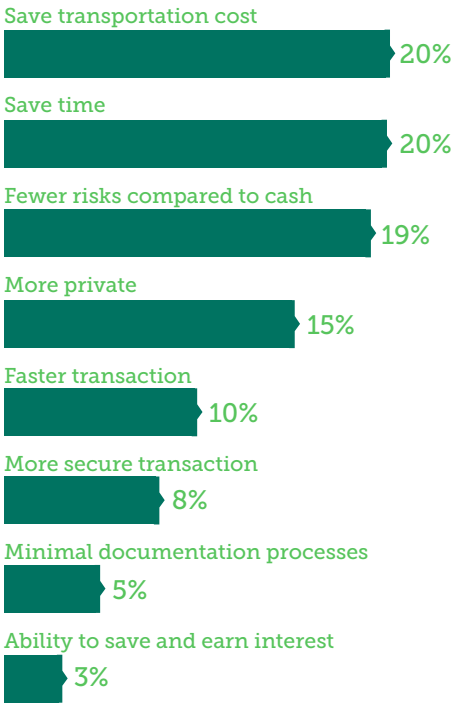
Figure 57: E-payment method used most frequently by cassava farmers in Nigeria



Mobile Money Benefits and Concerns

In spite of the low mobile money usage, and aligned with inputs during the FGDs, 40% of farmers (90) believed the most important benefit is either reduced transport cost (20% or 90 farmers) or time savings (20% or 90 farmers). These are closely followed by 19% (85) and 15% (67), respectively, for increased security and more privacy.

Figure 58: Perceived benefits of mobile money

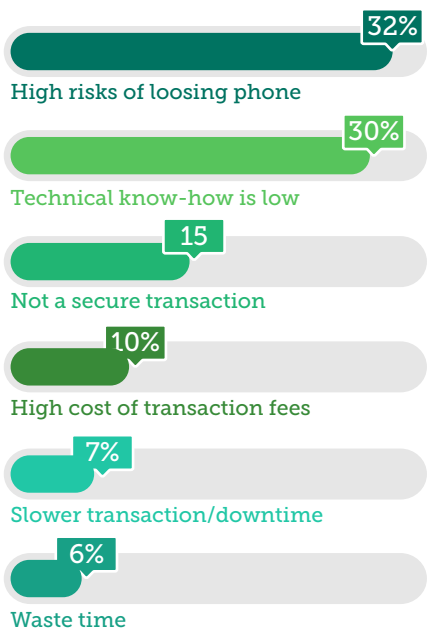


Meanwhile, the most significant concern about using mobile money for 32% of farmers (144) was the risk of losing their phone. This was closely followed by 30% of farmers (135) who believed they did not have the technical skills to use mobile money on their phone. These concerns were echoed during the FGDs that considered the safety and security of the mobile money balance if phones are damaged (i.e. falls into water) or lost/stolen, accessed by unauthorized persons as well as if the farmer sends money to an incorrect number. Two FGD participants wondered about;

- "Dialing a wrong number in a hurry and directing the money there."... *Male, 18 - 30 years*
- "If your phone get stolen or lost, somebody may steal your phone and your business partner sends money to your phone."...*Male, 31- 45 years*

For any mobile crop payment intervention these and other concerns can be mitigated with the requisite awareness raising and education effort.

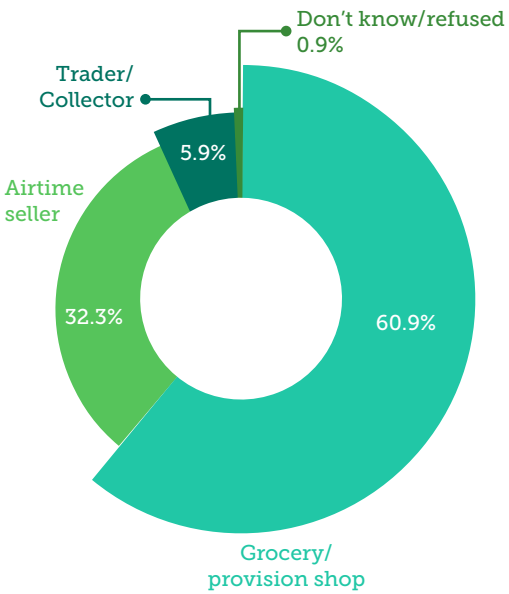
Figure 59: Farmer concern about mobile money



Suggested Mobile Money Agent

Of the 193 farmers (42.8%) that are willing to use mobile money, 60.9% of those farmers (117) believed the most appropriate cash-in/cash-out agents would be neighborhood grocery/ provision shop owners. Another 32.3% (62) believed neighborhood airtime sellers would be the best agents. These results align with the requisite need for a high level of trust with agents that are located where targeted farmers live and work.

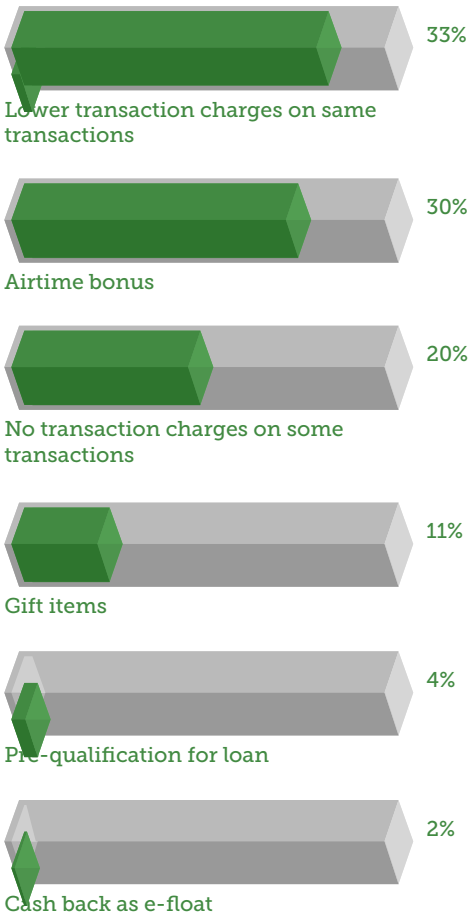
Figure 60: Most ideal cash-in/cash-out mobile money agents



Suggested Incentives to Encourage Mobile Money Uptake

Of those 193 farmers willing to use mobile money 33% (64) believed the most significant incentive to promote the use of mobile money would be to lower transaction fees on selected transactions. Another 30% (58) prioritized free airtime top-up as the best incentive.

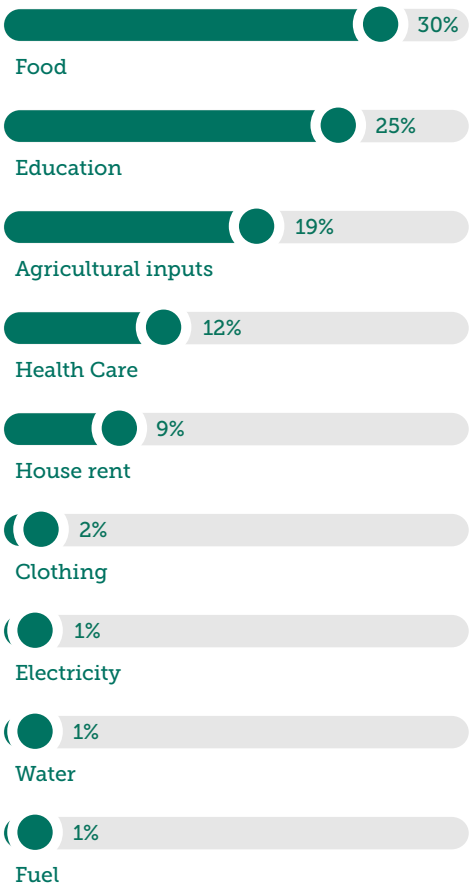
Figure 61: Incentives to promote mobile money uptake



Household and Business Expenditure/Bill Payment

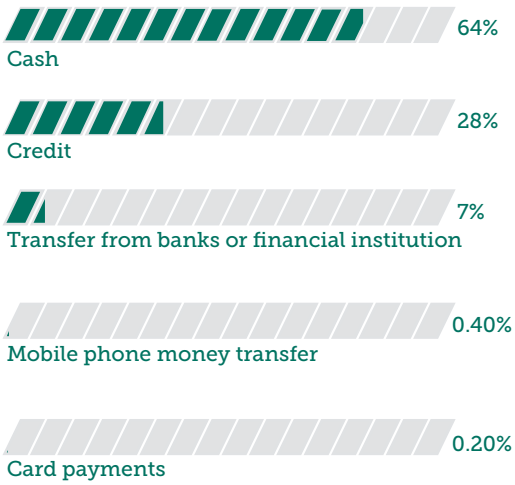
Only 4% of cassava farmers (18) currently use mobile money while 193 farmers (42.8%) are willing to use mobile money. In addition to receiving mobile payments for their cassava crop the nature and frequency of their monthly expenses presents further potential for migrating their household finances to mobile money. Overall, and somewhat similar to their pattern of savings behavior, their disposable income is portrayed in Figure 62. Paying for food, education and agricultural inputs ranks as the highest expenditures for 135 (30%), 112 (25%) and 85 (19%) of farmers, respectively.

Figure 62: Discretionary household spending



For 287 farmers (64%) cash is their primary mode of payment for basic household expenses. The use of credit is considered by 126 farmers (28%) to be their primary mode of payment. Both of these payment behaviors present transaction flows that can be migrated to mobile payments.

Figure 63: Mode of payment for household expenses



For the previously mentioned discretionary household spending, 14.3% is done daily, 11.4% is done weekly and 7.2% is done every two weeks. These spending behavior frequencies are likely more optimal, from a mobile money perspective, compared the 52% and 15% for monthly and annual frequencies, respectively.

Figure 64: Payment frequencies

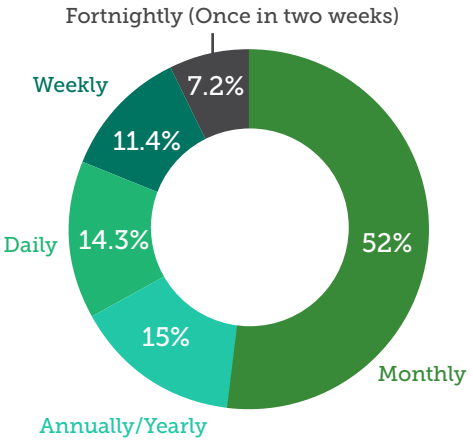


Figure 65 reveals that respondents make 48% of their payments wherever might be their point of purchase for products and services. Forty (40%) of their payments are made at the household/farm for services such as farm labor as well as repair, construction and other manual labor. While relatively infrequent the trips to the bank branch and utility office to make cash payments are very likely inconvient and expensive in terms of time and transport cost.

Figure 65: Cash payment locations

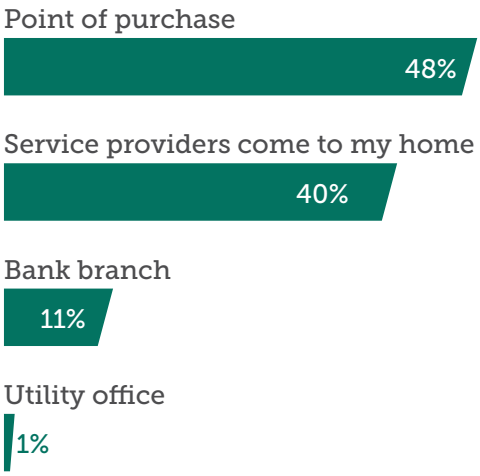


Figure 67 reveals that 434 farmers (96.7%) need 30 minutes or less to reach a location where they can access (deposit or withdraw) funds. Meanwhile, figure 66 reveals that 431 farmers (96%) must travel up to five kilometers to reach that funds access point. The insertion of mobile crop payments, together with the requisite ecosystem of cash-in/cash-out agents and merchants conveniently located where farmers live and work, will be of significant benefit to farmers.

Figure 66: Distance to access funds

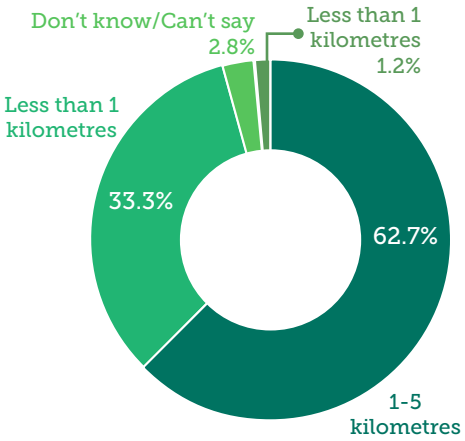
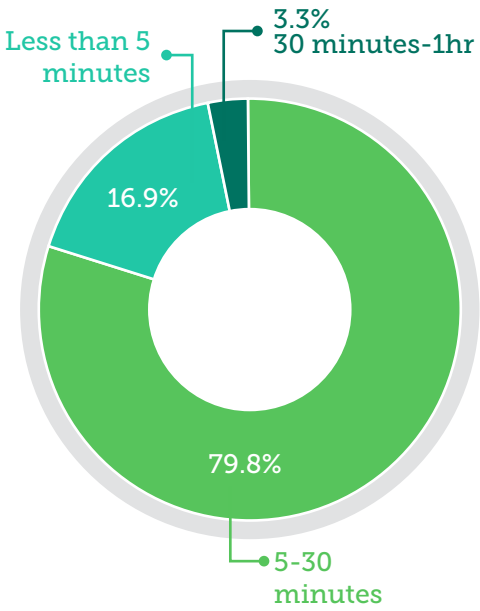


Figure 67: Time to access funds

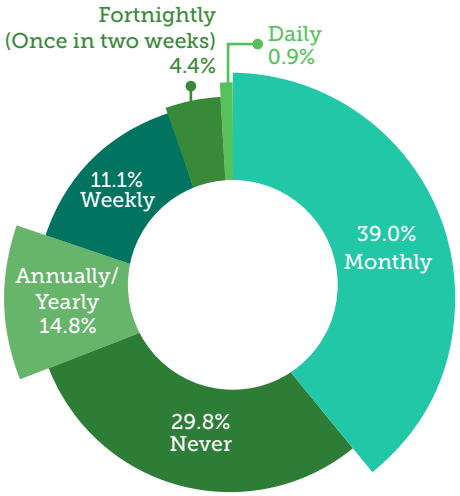


Money Transfer and Remittances

During the focus group discussions farmers stated that they send and receive money to/from spouses, friends, relations, business partners and customers. They do so through both formal and informal means. This applies regardless of whether the transfers are local or international. For international transfers, they do so formally through international money transfer operators like Western Union, and informally by hand delivery through friends and relatives. For local transfers they do so formally through their bank accounts and by direct deposit into the recipient's bank account, as well as informally by hand delivery through friends and relatives, recharge cards, inter/intra state bus services or known drivers.

Sending and receiving money is done monthly by the majority of farmers.

Figure 69: Frequency of Receiving



As portrayed in Figure 70, in terms of sending remittances 346 farmers (77%) send N10,000 (€29) or less and the average amount sent for all farmers is N4,696 (€13.7). The average amount of remittances that farmers receive, N9,316 (€27), is almost double what they send (Figure 71). A total of 275 farmers (61.3%) receive N15,000 (€43.7) or less. Another 106 farmers (23.4%) receive between N15,001 (€43.7) and N25,000 (€72.8).

Figure 68: Frequency of Sending

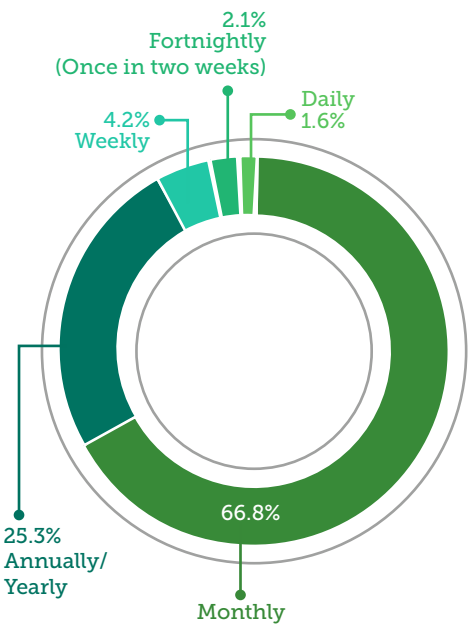


Figure 70: Sending of Remittances

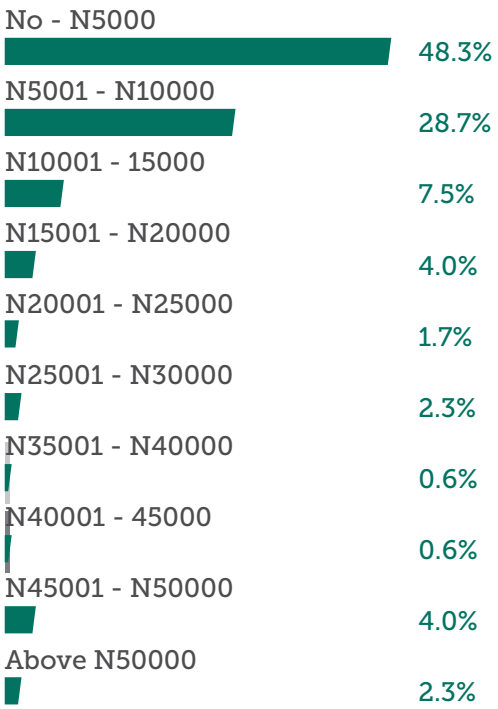
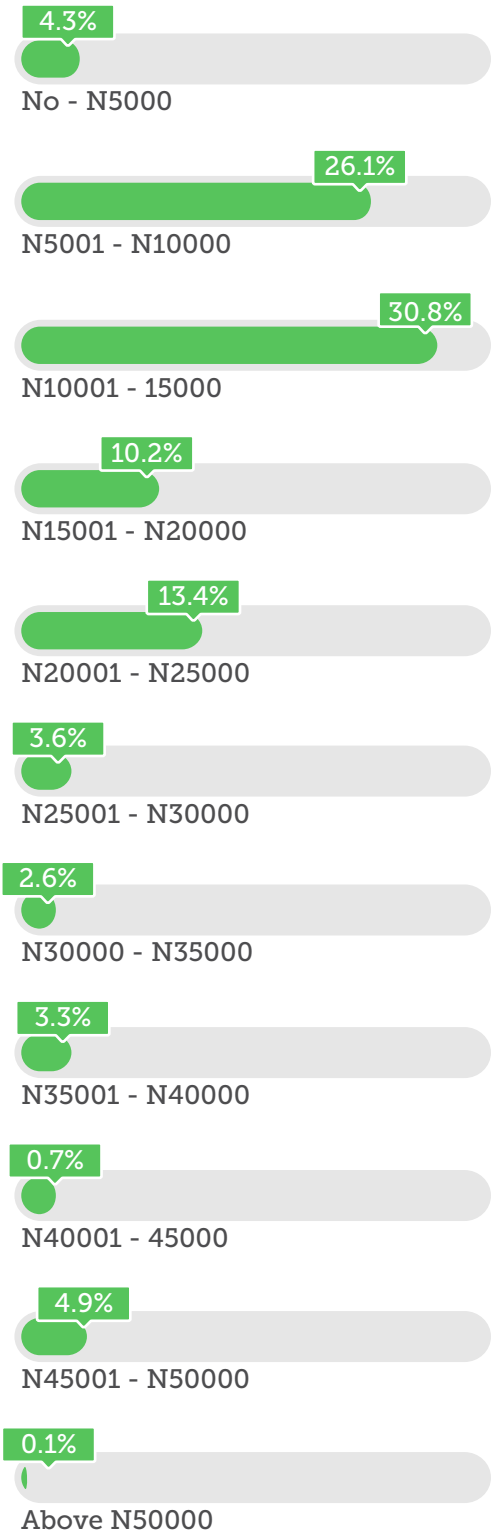


Figure 71: Receiving of Remittances

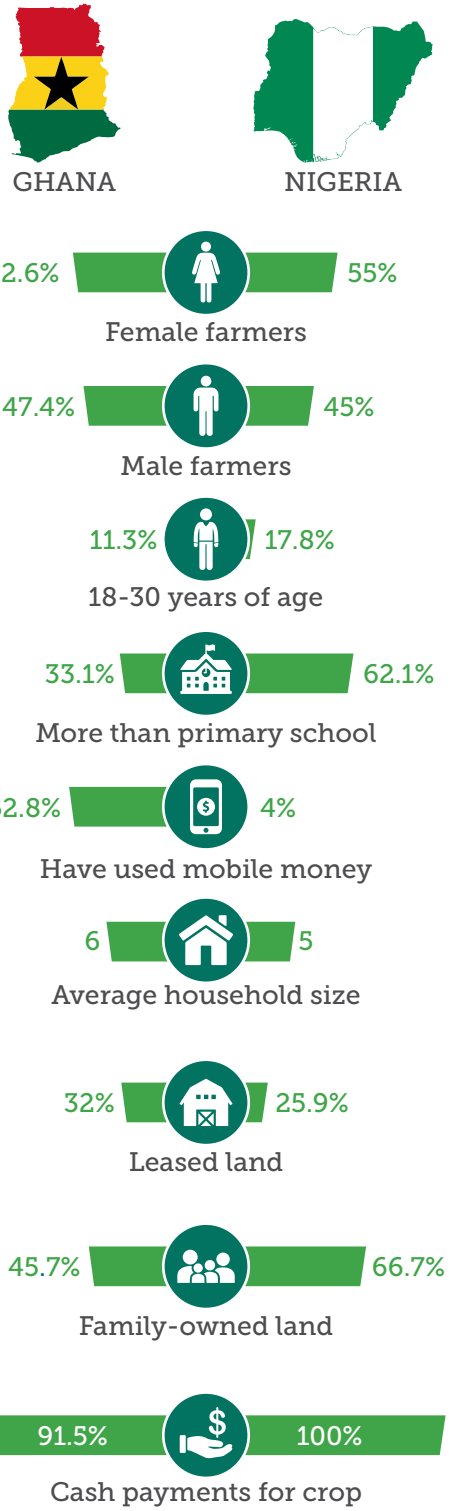


Chapter 5: Summary and Recommendations

Summary

The study reveals that the ratio of male to female farmers engaged with the production of cassava is about the same in Ghana and Nigeria. The study also reveals that 80-90% of cassava farmers are above the age of 30 which corroborates the consensus opinion for the need to encourage younger generations to take on farming. It is interesting to note in Ghana, while only 33.1% of cassava farmers have more than a primary school education, 52.8% (243) use mobile money. This contrasts with Nigeria, where 62.1% of cassava farmers have more than a primary school education, but only 4% (18) use mobile money.

The average farming household size in both countries is five to six persons. Their main income source is from their small scale farms and 80-90% of farmers in both countries earn €215 or less. To diversify their risk, in addition to cassava most farmers in Ghana also cultivate maize unlike in Nigeria where they diversify their cassava farming with retail trade such as kiosks. Most land used for cassava cultivation is either leased or family owned (either titled or non-titled). The main customers of the cassava farmers who participated in the study are traders and processors that individually negotiate prices with them at their homes/ farm gate. This points to some level of personal relationship between farmers and off-takers. Cash transactions dominate the entire value chain where farmers receive cash payment from off-takers for their cassava and pay their expenses in cash.

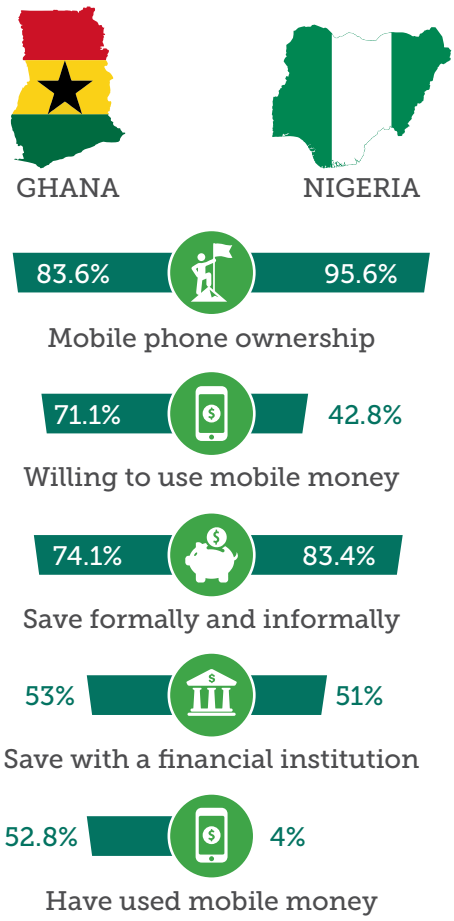


The study reveals that mobile phone ownership is 83.6% and 95.6% in Ghana and Nigeria, respectively. In addition, they use multiple SIM cards so that they are always connected. The phone is a personal tool which farmers will typically not share with others. Most farmers use their phones to make and receive calls. In Ghana, where mobile money usage is high (52.8%), 45% of farmers can receive text messages but only 32.4% can send text messages. In Nigeria, where mobile money usage is quite low (4%), 68% of farmers can receive text message and 58% can send messages which bodes well for the potential for mobile money uptake.

Farmers expressed willingness (71.1% in Ghana and 42.8% in Nigeria) to use their mobile phones for financial transactions, such as payment of bills, noting that it is convenient, saves time and faster. As such, farmers will find strong value in receiving payment through mobile phone. On the other hand, farmers were concerned about their technical know-how with their phone for doing financial transactions as well as transaction delays due to unreliable network connectivity and the risk of phone loss/theft.

In both Ghana and Nigeria, the habit of savings is 74% or higher whether formally with a financial institution or informally by way of home storage, Susu collectors and Savings & credit cooperatives (e.g SACCOs).

Engagement with formal financial institutions is encouraging but requires effort to improve. The top reasons for savings are to be able to pay for school fees and farm maintenance as well as to purchase agricultural inputs supplies (seeds, chemicals and fertilizers). On the other hand, the reasons for not saving are mainly because they do not have money and the financial institutions are too inconvenient in terms of distance, documentation and/or cost. The main transactional activities that occur at these institutions include depositing or withdrawing money and most farmers make a savings deposit at least once a month. Also, majority of farmers indicated that their monthly expenses include the following items: education, agricultural inputs, food, electricity and healthcare are key features.



While in Ghana, six out of 10 farmers have heard of mobile money mainly through radio and by word of mouth, in Nigeria only four out of 10 have heard of mobile money. Among the e-commerce methods in Ghana, mobile money was the most known and used method whereas in Nigeria ATM usage was the main e-payment channel. In Ghana, of the farmers with mobile money 73.2% registered for their mobile wallet through an agent in their community. In both countries the majority of transactions done on their mobile wallets is for sending and receiving money. In Ghana, six out of 10 farmers use the service at least once a month. The majority of farmers in Ghana (over 85%) spend between 1 and 30 minutes to reach a mobile money agent. Reasons given in Ghana to support the use of mobile money by farmers is that the service is readily available/accessible, convenient and secure. On the average most farmers in Ghana send GHS 100 (€21.5) and receive GHS 200 (€43) per transaction through mobile money. In both countries, airtime bonus as well as gift items such as mobile phones, branded t-shirts and cash back e-float were noted as the most preferred incentives for farmers to use the services.

Recommendations

The cassava value-chain is dominated by smallholder farmers and the following recommendations are proposed to drive further uptake of mobile money services:

- Given the aging population of farmers there should be a policy to encourage the involvement of more youth in agricultural production. It is therefore important for interventions to encourage the youth to take up production of cassava.
- Radio, peer learning and TV have shown to be effective tools for overcoming these financial literacy and awareness barriers.
- Given the characteristic of youth as early adopters of ICT/mobile, this will drive the use of mobile money services thereby deepening the financial inclusion for farmers.
- Mobile money operators should collaborate with agribusinesses to strengthen their agent and merchant networks where farmers live and work. The agents should be equipped to train farmers who interact with them in order to improve their understanding and use of mobile money services. In addition, agent liquidity is critical if farmers are to find mobile money services more attractive.
- Education of farmers about the features and benefits of mobile money is needed to build their capacity to know how to use these services and build trust in using them.
- Providing incentives to farmers who patronize mobile money services should be encouraged to entice farmers and users to patronize the services.
- Deliberate and strategic marketing and partnership is required to promote proper savings and encourage cash light/ cashless transactions using mobile money services.

Resources

- Babcock, L. (2015, May). Mobile Payments: How digital finance is transforming agriculture. The Technical Centre for Agriculture and Rural Cooperation. ISBN: 978-92-9081-584-6
- Babcock, L. (2014, Aug 20). Three Steps to Jumpstart Mobile Finance: Step 3 - Overcoming farmer' illiteracy, financial illiteracy and lack of trust. NextBillion.net blog.
- Babcock, L. (2014, Aug 13). Three Steps to Jumpstart Mobile Finance: Step 2 - Forming strategic alliances. NextBillion.net blog.
- Babcock, L. (2014, Aug 6). Three Steps to Jumpstart Mobile Finance: Step 1 – Researching smallholders' financial behavior to help them transition to mobile payments. NextBillion.net blog.
- Babcock, L. (2013, Oct). Leveraging market solutions by understanding daily patterns of life. NextBillion.net blog.
- Business and Financial Times (B&FT online), May 12 2016. Cassava: Crop of the Year. http://thebftonline.com/business/agribusiness/18923/cassava-crop-of-the-decade-.html (accessed December 5, 2016)
- Chinedu, O. (2017, Jan 29). Nigeria Tops List of Money Transfer Markets. cajnewAfrica blog.
- Dowuona, S. (2016, Nov 15). Mobile money records 420% growth in 5 years. Adom News.
- East Africa Venture Capital Association (n.d.). Case Study Compendium.
- Ezeh, U. (2016, Nov 6). Why mobile money has not been widely accepted. The Guardian.
- GSMA (2016, Oct). Driving a price revolution: Mobile money in international remittances.
- International Fund for Agricultural Development (IFAD) & Food and Agriculture Organization (FAO) of the United Nations, 2005. A review of cassava in Africa with country case studies on Nigeria, Ghana, the United Republic of Tanzania, Uganda and Benin. Proceedings of the Validation Forum on the Global Cassava Development Strategy Vol 2. Rome.
- Kleih U., Phillips D., Wordey M.T., & Komlaga G., 2013. Cassava Market and Value Chain Analysis - Ghana Case Study; Final Report.
- Otoo, J.A. 1998. Centre Commissioned External Review of IITA. The Root and Tuber Crop Improvement Programme of the Crops Research Institute, Kumasi, Ghana.
- Statistics, Research and Information Directorate (2013). Facts and Figures 2012. Ministry of Food and Agriculture, Ghana
- USAID, 2012. Using Mobile Finance to Enhance Agriculture in Africa. http://pdf.usaid.gov/pdf_docs/PA00J7PH.pdf (accessed December 6, 2016)
- Vodafone. (2011). Connected Agriculture: the role of mobile in driving efficiency and sustainability in the food and agriculture value chain. Page 17.
- Wall Street Journal (2015, Nov 19). Turning African Phones into Wallets.
- West African Agricultural Productivity Program (WAAP), 2009. Baseline Survey Report. Retrieved from http://waapp.org.gh/waappmedia/reports/10-waapp-baseline-survey-report-ghana-waapp-1a/file (December 5, 2016)

Appendix