

Kenyan Farmers' Use of Cell Phones: Calling preferred over SMS

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Abstract: The increasing penetration of mobile phones in Kenya has led to a rise in SMS-based information dissemination services. Such services have potential to reduce information asymmetry and empower farmers with weather, market, and other relevant information. However, a number of factors other than the sheer existence of the phone need to be in place for such potential to be realized. Data was gathered using 117 questionnaires administered in 6 Kenyan provinces, as well as 12 focus groups conducted in 4 locations around Kenya. Findings revealed that Kenyan cell phone users still prefer to call rather than SMS (short message service) due to the ease of calling and little practice using SMS. SMS-based information providers should, therefore, consider adding a voice-based product to their services in order to expand their market reach.

Keywords: mobiles; SMS; agriculture; trust; information and communication technology; Kenya

1. Introduction

The successful uptake of the mobile phone throughout the developing world has significantly impacted economic development initiatives. Governments, private corporations, and non-profit organizations are all examining the possibilities for using this new means of communicating with citizens.

From 1999 to 2009, mobile phone penetration rose from 12 per cent of the global population to nearly 76 per cent (ITU 2011). By allowing communication at distance, mobile phones allow users to overcome limits of time and space. The first SMS (Short Message Service) was sent on 3 December 1992 (The Times of India 2002). By 2008, over 4 trillion SMS text messages were being sent around the globe (ITU Internet Report 2006). Today, SMS has become a huge commercial industry worth over \$81 billion globally as of 2006 (ITU Internet Report 2006). SMS is widely used to spread information from individual to individual. However, especially in the developing world, organizations and governments are increasingly using SMS to reach out to rural populations that could not previously be contacted. But the SMS habit is not yet deep-seated in East Africa as compared to other regions and countries (Hellstrom 2010). One possible reason for this, given by Hellstrom (2010), is the per-second pricing scheme in East Africa. The calling price system can give more value for money than using SMS, assuming that the call is very brief. Literacy, although high in Kenya at 85.1 per cent (IndexMundi 2011), is also another potential barrier to SMS use.

The penetration of mobile service in Kenya has reached 64.2 per 100 inhabitants (Communication Commission of Kenya 2011). At the end of June 2011, Kenya had 25.27 million mobile subscribers (CCK 2011). Kenya's high mobile penetration rate and subscription number indicates that mobile technology is a promising business opportunity, and an indispensable tool for empowering the country's citizens, especially its rural poor.

The majority of Kenyans (78.4 per cent) live in rural areas (CountrySTAT Kenya 2009). These rural communities rely largely on agriculture as their main means of sustenance. There is a growing and enthusiastic discussion between policymakers, development practitioners, and researchers about the role of mobile phones and SMS in economic and agricultural development. By reducing communication costs, mobile phones may assist farmers in identifying potential buyers or facilitating the purchase of inputs in rural areas (Aker 2011).

Mobile phones may also help with agricultural extension outreach. Lawal-Adebowale and Akeredolu-Ale (2010) collected data in southwest Nigeria to understand perceptions of ICT usage for agricultural development by three stakeholder groups – agricultural researchers, extension agents, and rural farmers. One finding was that the farmers had a high perception that the “linkages with the researchers and extension agents can be effectively achieved through the mobile phone if the device is owned by all” (Lawal-Adebowale & Akeredolu-Ale 2010). However, this study did not specify whether farmers thought they could link to researchers and extension agents through voice calls, SMS, or another mobile-based service.

A working paper by Mittal et al. (2010) found that the quality of information, its timeliness, and trustworthiness are the three important features that can enable farmers to use mobile-enabled agricultural information effectively. The Indian study found that while mobiles are currently being used in ways that contribute to farm productivity, they are not being used to their full potential. Infrastructure and farmers’ capacity to use the information need to be improved in order to realize the full information dissemination potential of the mobile phone. This study sought to see if findings like Mittal et al. (2010) also hold true in the Kenyan context. A flood of new development initiatives using SMS to send information to rural farmers has emerged in Kenya. This study hopes to better understand the use of SMS by Kenyan farmers in order to enhance such new emerging initiatives.

Some of the new agricultural SMS-based service providers include MFarm Ltd., which provides access to localized, current data on markets and weather as well as a network for buying and selling farming goods through SMS (MFarm Kenya 2011). The Kenya Agricultural Commodity Exchange (KACE) has an SMS-based information service, *SokoniSMS*, for farmers to receive market prices in Kenya (KACE Kenya 2011). GSMA recently announced its MFarmer Initiative Fund, supported by a grant from the Bill & Melinda Gates Foundation. The purpose of the Fund is to “encourage mobile communications service providers (in partnership with other public and private sector agriculture organisations) to use mobile communications to provide information and advisory services to smallholder farmers in developing countries who are living on under US\$2 per day” (GSM 2011). WMO/Sony Ericsson/Airtel have partnered to start “Weather Info For All,” an initiative that will send weather forecasts to farmers via SMS (World News Inc. 2011).

It is important to understand how farmers are using their phones to ensure that new development initiatives are properly addressing farmer’s concerns and have utility for farmers. The findings of this study will allow development organizations, mobile application developers, and those in the M4D sector to have a more accurate understanding of Kenyan farmers’ current use of mobile phones, especially related to SMS.

1.1 - Study Objectives

In order to fulfil the purpose indicated above, the evaluation sought to answer the following core questions:

- What are typical usage patterns of mobile phones in general, that may influence the use of SMS as a channel for agricultural information?
- How do farmers use SMS? (Basic demographic profile of users)

- Do farmers trust SMS?
- What are barriers to the use of SMS?

2. Data and Survey Methodology

This article is based on fieldwork carried out in Kenya from January 2011 to July 2011. The evaluation was comprised of two parts. First, twelve semi-structured focus groups were conducted in 4 locations in Kenya by a moderator and observed by an objective researcher. Three of the groups were in Kiambu, Central Province, three in Chavakali, Kakamega, Western Province, three in Murungaru, Kinangop, Rift Valley Province, and three in Engineer, Kinangop, Rift Valley Province with the following composition:

Table 1: Composition of semi-structured focus groups in Kakamega, Kiambu, Murungaru, and Engineer, Kenya

Women 30-55 years 3-10 participants	Men 30-55 years 3-10 participants	Youth, mixed gender 20-29 years 3-10 participants
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Focus group participants were selected for the focus groups using a two-page recruitment survey, conducted in households in the regions specified above. The 90-minute focus group discussions, conducted in Swahili, were based on the discussion guide. The focus groups allowed for engaging dialogue and produced data and insights that would be less accessible without the interactions found in a group setting.

Second, 117 questionnaires were administered in six different provinces (approximately 20 from each province: Rift Valley, Coast, Nyanza, Western, Eastern, and Central). The three-page questionnaire was comprised of yes-or-no, multiple-choice, short-answer, and prioritization questions. Use of the questionnaire allowed for more geographically diverse data to be collected.

The questionnaire data was coded and analysed using SPSS software. The focus group discussions were video-recorded, translated, and transcribed. Interview transcripts were then analysed and manually coded for any recurring patterns and themes that emerged.

3. Findings

This study found that voice is more used and understood than text messaging. Rural households use phones for personal, community, and work/farm-related activities.

3.1 – Voice versus SMS

Most farmers, regardless of age, sex, or location, tend to prefer making calls to using SMS. Farmers cited that they often prefer calling to SMS because calls consume less money to get a final response (there is much back and forth with SMS). *“SMS is cumbersome and takes a lot of time and energy so it is easier to call” (Kakamega man)*. Reasons for using the different services as stated by farmers in both locations are listed in Figure 1 below.

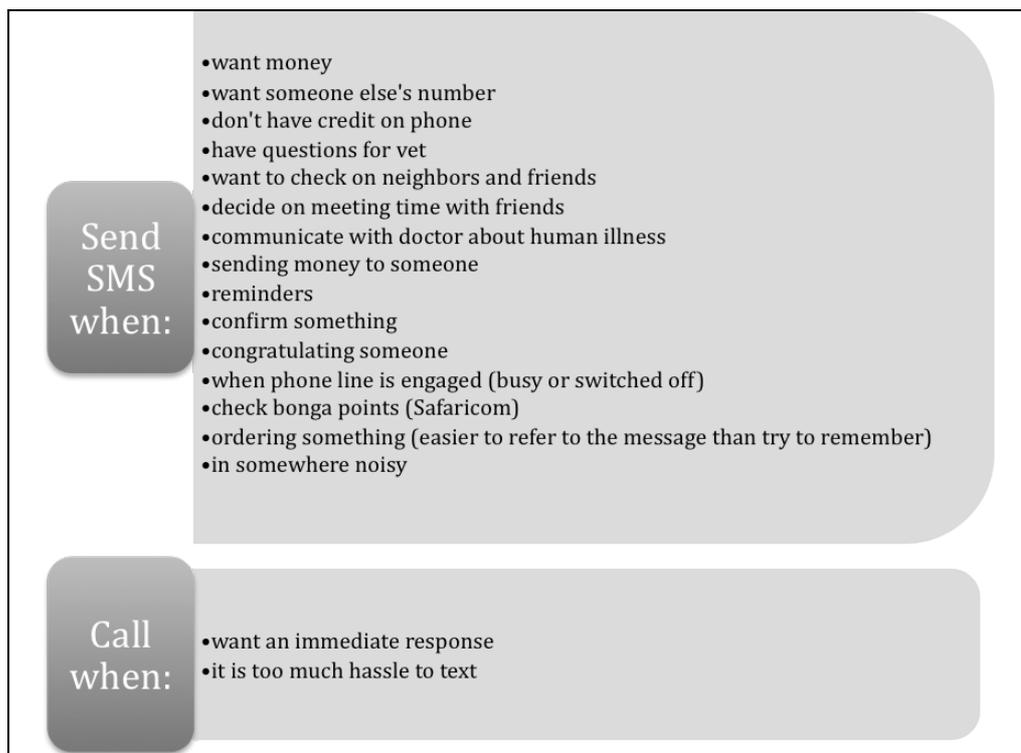


Figure 1. Reasons stated by farmers for calling vs. sending SMS

Rural households use phones for personal, community, and work/farm-related communications (Figure 2). Most discussions centred on family/friends and work on the farm, with weather being the third topic most often discussed on the phone. James Goodman (2005) found that in South Africa and Tanzania, mobile phones are used mostly in strong links (family and friends), but also in weak links with others outside the community, including businessmen. Larger multi-country studies by Miller et al. (2005) and Souter et al. (2005) also show that the telephone is used extensively to maintain social networks (Molony 2008). This data from Kenya further strengthens these findings, showing that already established relationships (friends and family) are both the primary content of phone calls/SMS and also the primary recipients of such calls/SMSs. Farm work (talking to middle men, farm help, produce buyers) is the second most common topic of phone calls/SMSs.

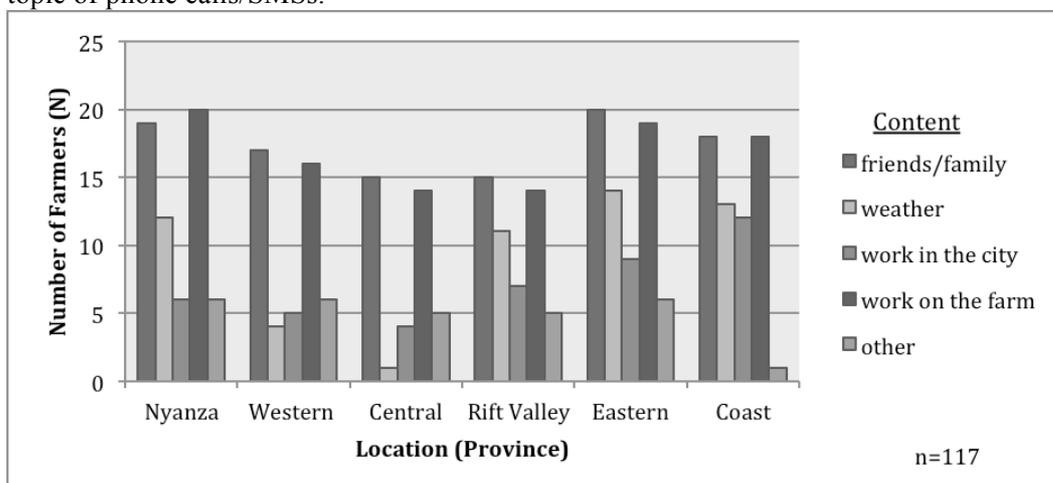


Figure 2. Farmers surveyed per province by content of phone communication (calling and SMS)

Figure 3 (below) shows the frequency that farmers called others versus the frequency that they send SMS. It appears that a large number of farmers (n=23) call between 11-50 times a week while only sending 0 – 5 SMS a week. The farmers (n=4) that communicated the most through phone calls (called others over 50 times a week) also communicated the most through SMS (over 50 times a week).

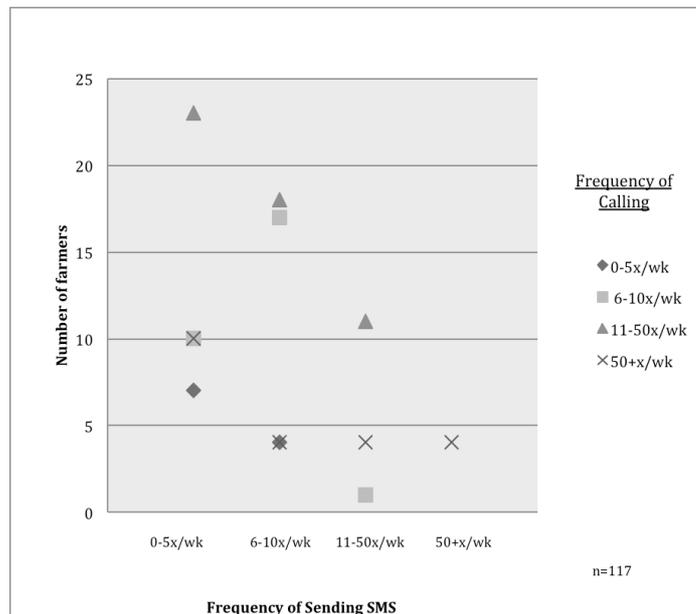


Figure 3. Comparison of the frequency of calls made to the frequency of SMS sent

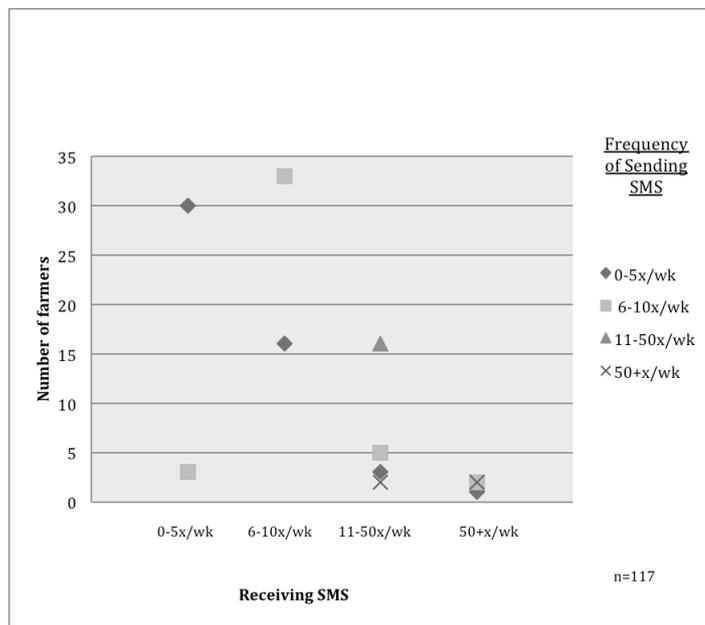


Figure 4. Comparison of frequency of SMS sent versus SMS received

Of those that participated in the study, most farmers (n=33) send and receive between 6 – 10 SMS messages a week (Figure 4). There is a higher frequency of farmers who do not send or receive many SMS (between 0 – 5 SMS/week) compared to those who send over 50 SMS/week.

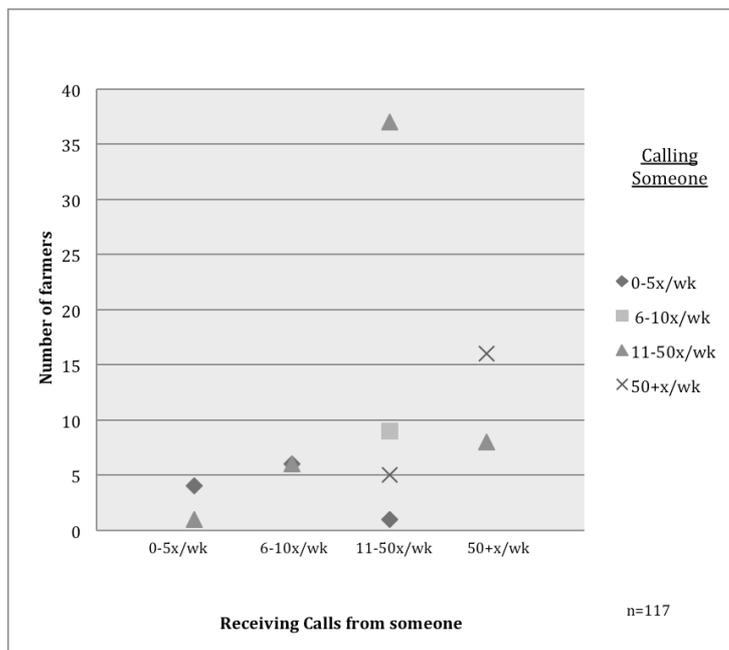


Figure 5. Comparison of frequency of calls received versus calls made

Of those that participated in the study, most call and are called between 11 – 50 times a week (n=37) (Figure 5). There is a higher frequency of people who call and receive calls over 50 times/week than there are who do not call or receive more than 5 calls a week.

This data shows that more farmers use phone calls to relay information on their mobile rather than SMS. There are several reasons for such use of phone calling rather than SMS that are discussed in sections 3.2 through 3.4 below.

3.2 – Trust

Trust is an important factor to take into account when discussing the electronic exchange of information communicated between two people, especially two strangers. In a study on the determinants of IT adoption and use, Khodamoradi and Abedi (2011) found that an important factor influencing the adaptation of any new technology is an individual's perception of the trust-worthiness of the technology. While trust is a difficult variable to measure, it is an important factor to keep in mind when trying to understand technology use and uptake. Information dissemination through abstract communication channels like SMS is dependent upon the trust relations that are established between the actors involved in these exchanges. For example, during our focus groups, farmers displayed doubt and wariness when receiving SMS from strangers.

Moderator: *What do you often do when you receive messages from strangers?*

"I often ignore them." "I won't do anything."

Moderator: *Why? "Because I don't know the sender." "I have to make sure that it is safe before I send the message." "I have to take my time before replying." "I often prefer for people to call me especially if they don't know me because I don't know who you are and I can't understand why you are sending it to me."*

It therefore appears, that if farmers are to use any information that is disseminated through the phone, they must be aware of the source, and secure in the integrity of the sender and information. If the farmer is unsure of the content's validity or sender's motives, many farmers stated that they would either delete the SMS or ignore it.

Additional considerations for farmers when deciding how to use information contained in an SMS were whether or not the SMS requires action, and the nature of the information contained in the SMS. Further investigation should be done to better understand precisely how these different factors affect the farmers' reactions.

3.3 - Information desired and used

Most farmers who participated in the study use the predicted amount of rain to determine how much to grow and when to grow their crops (Figure 6). The second most important determinant for how much to grow and when to grow was the price of seeds. The other variables (price the crop will sell for, difficulty to grow the crop, other) did not appear to be as important in the farmers' decisions. This seems to indicate that an accurate rainfall forecast is the most important information to convey to farmers as they decide how much to grow and when to grow their crops.

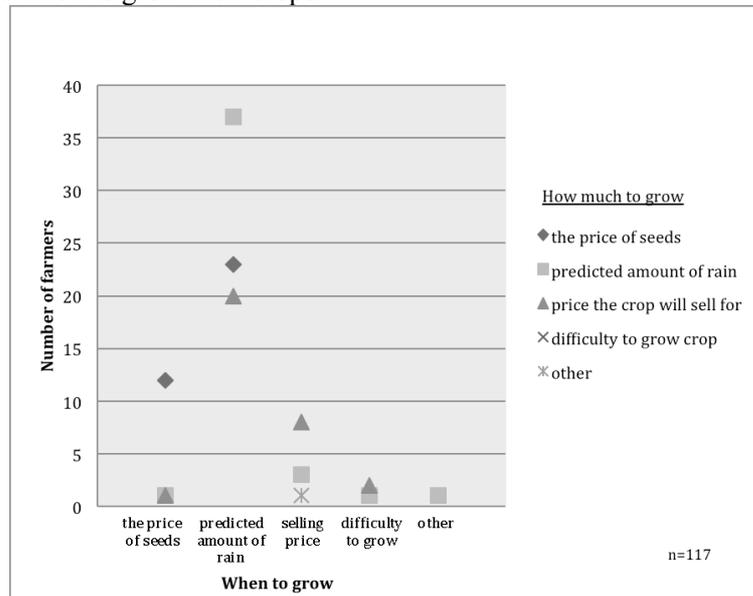


Figure 6. Comparison of information used by farmers to determine when to grow crops and how much to grow

The method in which this information is disseminated should be considered carefully. Although farmers expressed an interest in a wide range of agricultural topics, some individuals stated they would not believe a message with advice about farming, e.g. about medicine to administer to sick cows.

“I would not take them seriously because with farming I should be practically showed what to do... For example, Christopher who keeps livestock, how do you expect that you send him a message to go and buy medicine and just give it to his cattle just like that. Who would trust that?”

Others stated that usage of any information relayed via SMS would depend on the content of the message. And still others said that if the agricultural information were true, it would not be relayed through SMS, but rather other, more public channels such as radio.

“As far as I am concerned when it comes to climate change we don't use SMS because we are so many farmers or people in the country who do cultivation. So if these people are genuine, they would not send SMS

they would just put it on air [radio, newspapers, TV, etc.].

So while it does appear that farmers are eager for information related to farming, SMS may not be the ideal medium through which to convey the agricultural information. Farmers seem more likely to use the information if it is disseminated through radio, newspaper, TV, or in-person.

3.4 – Users' cell phone skill level

An interesting observation was made during a number of the focus groups (Youth Kakamega, Youth Murungaru, Women Engineer) that also warrants further study. Some of the farmers were observed copying down the phone number of an SMS sender on a slip of paper. It can be imagined that copying down a phone number then entering it in order to send an SMS reply leaves much greater room for human error than simply using the “reply to sender” option within the phone. When queried as to why they did not use the reply option, it became known that the farmers did not know about the reply option. This reveals a lack of full understanding about basic SMS use and may also indicate why farmers believe SMS to be so cumbersome to use.

4. Recommendations

At 1 Kenyan Shilling per SMS (as of Nov. 15, 2011), sending SMS is still the cheapest option to communicate with farmers. SMS allows details to be recorded and referred to later and can be helpful to remind farmers about meetings and products. Nevertheless, SMS is no panacea for farmers' information problems. There can be many obstacles to overcome when attempting to communicate with farmers via SMS. When using SMS, Agricultural Information Service Providers should keep the following points in mind:

- Keep messages simple and to the point. Farmers will be more likely to respond when the message is straightforward.
- Allow SMS recipients the option of opting out of the bulk SMS services.
- Include organizational contact details within the SMS.
- Farmers will be wary about any advice given via SMS unless the sender is known and/or well-established (like government or large NGOs).
- It may be helpful to initially call or visit the farmer to introduce and explain how their number was received and what future SMS content will be about.
- State whether or not the response SMS farmers send will be free or cost money and if the response SMS will cost, how much.

There are not yet many mobile applications or services that build on voice in Kenya. The current SMS-based agricultural services being provided in Kenya can be further enhanced by ensuring that there is also at least one voice-based aspect or product offered. By accommodating for clients who are not as proficient or comfortable using SMS, a larger target market will be reached and slower acceptors of the technology may become more familiar with SMS over time.

One example that might be borrowed for Kenya is an Interactive Voice Response (IVR) system, Avaaj Otalo, which provides three avenues for Indian farmers to engage with agricultural information (MobileActive 2011). When farmers call the hotline number, they can either listen to archived information, announcements, or participate in the question-answer forum. Another example is IFFCO Kisan Sanchar Limited (IKSL), a voice-based agricultural information service to empower rural farmers in India (GSMA 2011). After purchasing a special SIM card, users receive free, recorded voice messages each day covering local and national agricultural topics.

Regular tech workshops in the communities should also be part of the organizational activity plan. Continuously teaching and training the rural communities will help contribute to faster uptake and use of SMS technology.

Finally, it is important to remember that SMS may not be the ideal medium through which to convey information. Farmers seem more likely to use information if it is disseminated through radio, newspaper, TV, or in-person. Carefully assess the reasons for using SMS and consider other media/ICT options or a combination of ICTs, to make the dissemination more effective.

Acknowledgements

This research project was sponsored by the Fulbright Commission (IEE). The author would like to thank MFarm Ltd. (K), especially Linda Kwamboka for support and assistance during the field study in Kinangop. I am grateful to Dr. Sevilla and the faculty and students at Strathmore University for helping with the questionnaire survey across the country, and to Irene Njoroge and Leonida Mutuku for their assistance with the focus group data. I appreciate the help of the Voice of the Farmer (Synovate - Kenya) staff for their assistance with the Kakamega and Kiambu field studies. Finally, thank you to the *iHub_, Daraja Mbili Primary School, and Kiarie for allowing use of their facilities throughout the project.

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