

Accessing agricultural information by rural farmers through mobile phones in Karaye Local Government Area of Kano State, Nigeria

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Abstract

This study investigated access to agricultural information by rural farmers through mobile phones in Karaye Local Government Area of Kano State, Nigeria. The objectives of the study include: to ascertain how the rural farmers access agricultural information through mobile phones in Karaye Local Government Area, Kano State; find out the sources of accessing agricultural information by rural farmers in Karaye Local Government Area; and determine the challenges that these farmers face in accessing agricultural information through mobile phones. A survey research method was used for the study. The study population comprised 1,279 registered rural farmers, 121 farmers, and three (3) wards were purposively selected as sample. A structured and closed-ended questionnaire was designed and used for the data collection. One hundred and twenty-one (121) copies of the questionnaires were administered to the registered farmers, out of which 95 copies were returned, representing 78%. Data collected were analysed using descriptive statistics of frequencies and percentages. The findings of the study reveal that rural farmers' significant mean access to agricultural information through mobile phones was short message service (SMS); that most farmers sourced agricultural information from their other farmers (colleagues) through mobile phones; that majority of the rural farmers indicated that the inability to access agricultural information from the formal sources (research institutes, extension workers, researchers) and lack of sufficient and wide mobile phone network coverage in the communities were the challenges being faced. The study recommends that: the Federal Government of Nigeria should through the National Communication Commission (NCC) liaise with telecommunication companies to reduce the rate of call charges so that rural farmers can make direct calls apart from Short Message Service (SMS) to extension workers or any other agricultural stakeholders to access agrarian information easily. Farmers should be sourcing agricultural information from research institutes, researchers, and extension workers apart from their colleagues (other farmers) to access relevant and up-to-date information to help achieve sufficient production and prevent poor harvest. The study concludes that with the timely access to relevant agricultural information by rural farmers Nigeria can attain food sufficiency.

Keywords: Access, agricultural information, mobile phones, rural farmers, utilisation

Introduction

Agriculture is a vital economic activity in different third-world countries where most of the countries' populations live in the rural areas and derives their livelihoods, directly or indirectly from agriculture (Alila & Atieno, 2006). In Nigeria, agriculture is the most crucial sector of the economy from rural employment, sufficiency in food and fibre, and export earnings before the discovery of oil. Muhammed (2007) asserts that a high share of rural communities and especially the rural poor are directly or indirectly dependent on agriculture through farming, food processing, fishing, forestry, and trade. It employs nearly 80% of the

people who are mostly rural or small-scale farmers and contributes 40% to the nation's GDP (Odetola & Etumnu, 2013). More than 70% of these farms at subsistence level (Nigeria Millennium Development Goals Report, 2004). As a result of that, the Nigerian government is spending its enormous foreign exchange in food importation. Adesina (2012) asserted that Nigeria spends about \$11 billion a year importing essential foodstuffs. For Nigeria farmers, especially rural farmers, to avoid post-harvest losses and produce sufficient food its citizens, agricultural information must be accessible to farmers. In this 21st

Century, information has been identified as an essential and crucial variable in transforming the farm production of many developing countries, Tologbonse, Fashola and Obadiah (2008) as cited in Carter, (1999); Meyer, (2003)

Information is regarded as one of the most valuable agricultural and rural development programmes. Information is perceived by Mohammed (2012) as "anything we physically or otherwise come across consciously or unconsciously and accidentally or intentionally that adds positively or otherwise to our existing knowledge, ideas and experiences. Agricultural information, in particular, is a critical component in improving rural farmer's agricultural productivity. In support of this, Zamani, Okwo, Dawang and Nakat (2014), argued that agricultural information is undoubtedly crucial in enhancing farm productivity and facilitating poverty alleviation among rural farmers. As opined by Agbamu (2006), agricultural information is all published or unpublished knowledge in all aspects of agriculture. Therefore, agricultural information is a factor which interacts with the other production factors that can help inform decisions regarding land, labour, livestock, and capital for the attainment of farmer's sufficient production.

However, access and use of appropriate agricultural information is an overriding factor for the attainment of successful and sufficient farm production and rural development. Unarguably, farmers can make a difference in any circumstance to the extent that they can access and utilise agricultural information for their agricultural production. Blait (1996) notes that the least expensive input for improved agricultural development is adequate access to knowledge and information in areas of new farm technologies, early warning system (drought, pests, diseases & the like). Others are improved seedlings, fertiliser, credit, and market prices. Oguya (2007) reported that Nigerian farmers hardly feel the impact of agricultural innovation mainly because they

have no access to vital or inadequate information.

In Nigeria, the government in recognition of the importance of communication devices in agricultural activities, established policies and projects in this regard; among which are: launching of the Global System of Mobile (GSM) communication-making phone lines more accessible nationwide and the Growth Enhancement Support Scheme (GES), which was designed to deliver government-subsidised farm inputs directly to the farmers via mobile phones (Egbule, et, al. 2013). This means that mobile phones are vital communication devices to farmers and can be used to access agricultural information using different features of mobile phones such as multimedia Services, Short Message Services, e-mail, voice call.

The term mobile phone is synonymously used and referred to a cellular phone, handphone, or device that one can make and receive calls and other services over a radio link while moving around a wide geographic area (Garba, Mohammed & Suleiman, (2016). Lawal (2008) opines that there would be a quick exchange of agricultural information between extension agents and farmers if ICT components are integrated into agricultural information delivery to farmers in Nigeria. When adequately utilised, a mobile telephone is a ready platform to assure access and use of agricultural information to rural farmers in Nigeria and particularly in Karaye Local Government Area predominantly occupied by farmers. The use of a mobile phone requires basic literacy, and therefore, are accessible to a large portion of the population. Onwuemele (2011) asserts that telecommunications companies have continued to expand their coverage; hence, many rural communities, especially those along main roads, have access to mobile phone services.

Based on the Worldometer elaboration of the latest United Nations data, Nigeria has 206,116, 239 population,

(Worldometer, 2020) Out of this figure, 185.9 are active telephone subscribers (Techeconomy. ng 2020). With such fast growth in mobile telephony, mobile telephones become indispensable and facilitate agricultural information access and use by rural farmers.

Statement of the problem

As mobile phones diffusion started to grow in many developing countries, its application in agricultural and rural development began to draw both researchers and policymakers' attention so much to enhance agricultural productivity. Mobile telephony is increasing daily for more significant and faster interaction within different groups of people from other societies, especially among farmers (Khong et al., 2009). Bako (2007) states that a mobile phone makes it easier to get access to certain information without going to the event's site.

Even though the opportunities offered by the use of mobile phones for improved agricultural production, observation, and preliminary investigation by the researchers revealed that rural farmers were inherently imprisoned by insufficient production and poor harvest, consequences of this inadequate production and poor harvest are evident in poverty, rural-urban migration, and untimely death of many people. The Nigeria National Population Commission (2004) asserts that the farming population comprises resource-poor peasants predominantly, cultivating an average of about two hectares of land usually on scattered holdings with low and declining productivity. Could this problem be attributed to the utilisation of mobile phones for agricultural information access and use? Erensein et al. (2004) argue that the low usage of mobile phones might be responsible for the relatively low yield of 147kg/ha obtained by the sampled farmers compared with the average of 2100kg/ha obtained from NERICA rice trials conducted in 21 states by the National Rice/Maize Centre. It was against, insufficient

production and poor harvest. This research was set out to investigate access to agricultural information through mobile phones by rural farmers in Karaye Local Government Area, Kano State.

Objectives of the study

The study centred on the following objectives:

1. To ascertain how the rural farmers access agricultural information through mobile phones in Karaye Local Government Area, Kano State.
2. To find out the sources of accessing agricultural information by rural farmers in Karaye Local Government Area, Kano State.
3. To determine the challenges that these farmers face in accessing agricultural information through mobile phones.

Literature review

Mobile phones are undoubtedly amongst the main instruments that can help rural communities, significantly ease the communication process, and the agricultural communities are encouraged to utilise it wisely. It has a significant role to play for agricultural information access and use. In a research carried out by Martin (2011), mobile phones and rural livelihoods: An exploration of mobile phone diffusion, uses, and perceived impacts of uses among small-to medium-sized farm holders in Kamuli District, Uganda. According to the Global System for Mobile Communications (GSM), there are more than 2.5 billion mobile phone subscribers worldwide. It is projected that by 2010, mobile phones will cover 90 per cent of the planet (GSM, 2008). The study used quantitative methodology, survey research method, qualitative interviews as the instrument and the research questions used were: What are the agricultural-based uses of the mobile phones? When was the mobile phone adopted? In terms of innovation attributes, what determined the adoption of the mobile phone? How have

mobile phone applications have been altered to fit the needs of the user? What is the perceived impact of agricultural-based uses of the mobile phone to individual adopters? The findings include: more than half of the farmers were using mobile phones to coordinate access to agricultural inputs, obtain market information, and to monitor agriculture emergencies and financial transactions. Furthermore, slightly less than half were consulting with experts via mobile phones, and recommendations include development planners should provide specialised training to promote mobile phones' productive use.

Johanes (2013) conducted a study titled, *The Role of Mobile Phone Communication in Diffusion of Dairy Goats Rearing in Mutonguni Division, Kitui County Kenya*. A survey research method was adopted; research instruments used were observation; interview; and questionnaire. While research questions include: What proportion of farmers own or have access to mobile phones? What are mobile phone products used by dairy goat farmers? What constraints do dairy goat farmers face in using mobile phone communication? The findings revealed that mobile phone communication among farmers helped enhance the rate of diffusion of dairy goat rearing, and farmers own or have access to mobile phones. However, no farmer communicates over mobile phones daily, and the constraint cited is the high cost of airtime. Recommendations were, the government puts measures that will lower the variables around ownership and use of mobile phones in the keeping of dairy goats, among farmers in different parts of the country to bring out their views on the improvements that they think can enhance their use of mobile phones to improve agricultural productivity in their farms, and the like in a study conducted by Baumüller (2012), titled *facilitating agricultural technology adoption among the poor: The role of service delivery through mobile phones*. The introduction shows that mobile phones

in poverty reduction and rural development have ignited much interest over the past decade and have become the most ubiquitous telecommunication technology in developing countries. The research methodology used was quantitative, with the survey method, focus group discussions, and individual interviews as instruments. Findings state that government agencies and non-governmental organisations are increasingly turning their attention to delivering services through mobile phones in areas such as health, education and agriculture. Moreover, it argues that m-services could help overcome some of the obstacles to technology adoption by facilitating access to information and learning. The recommendation suggests that further research is needed to understand how their particular challenges could be addressed through m-services and other support activities.

Farmers require information production and marketing, and information to support their business operations. These farmers use the information obtained from a source or combination of sources for their activities (Parma, Soni, Kuwornu & Salin, 2019). They utilise ICT and Non-ICT sources to obtain agricultural information for farming activities, (Parmar, Soni, Kuwornu & Salin, 2019). Improvement of agricultural productivity will be achieved when farmers are linked to the right information through an appropriate medium or tool (Garba, Mohammed & Suleiman, 2016). To Pipy (2006), farmers' access to different information sources helps them get information about improved technologies and enhance innovations. It is essential to realise that information is dynamic and continuously changing to respond to the changing environment to meet the farmers' agricultural information needs on their production activities and decision-making, which can be accessed from different sources. Samuel (2001) posits that there are three significant organisations or seeds, which generate agricultural information.

These are government, agrarian extension systems (both at federal & regional levels), and research institutions.

In the opinion of Adomi, et al. (2003), other sources of agricultural information are the various agricultural research institutes and schools of agriculture in the universities and the federal and state ministries of agriculture. According to Fekadu (1997), though knowledge is produced through agricultural research, it is not the only avenue for knowledge generation. Learning from experience, interaction, and farmers' experimentation is other sources. Salomon and Engel (1997) argue that farmers had been innovators for centuries, based on their farm experimentation. Never the less, farming families, agricultural cooperatives, agribusinesses, agrarian press, television, newspapers and libraries can serve as other sources of agricultural information for the farmers.

On the issue of challenges facing farmers, there has been some consensus on the determinants or constraints to technology adoption, particularly in the agricultural context. This includes levels of education, wealth, risk preferences, expected returns, tastes, access to information, and Jenny and Aker (2010). The growth of mobile phone coverage across Africa has shown a strong positive correlation with population density. However, other factors matter as well, for instance, using a spatially disaggregated dataset of mobile phone coverage and geographic characteristic. Buys et al. (2009) discovered that the probability of having a mobile phone tower in a particular location is strongly and positively associated with potential demand factors, such as population density and per capita income and the competitiveness of the mobile phone sector within the country. They also found that factors associated with higher costs, namely, higher elevation, steeper slopes, and distance from the main road and major urban centres are negatively related to mobile phone coverage.

According to Samuel et al. (2005), factors that affect the adoption and utilisation of agricultural technology include; technological or innovation factors, institutional factors, individual factors, and agricultural information's nature to be communicated (Rashid, 2007). Technical aspects have relative advantages of the innovation, complexity, compatibility, cost and the image surrounding it. Institutional factors include the firm's size, quality of existing information systems, the intensity of the information being processed, the urgency of information, the level of specialisation of the firm, and the management level. On the other hand, individual factors affecting innovation adoption and use incorporate the decision-makers' innovativeness and their knowledge of technology. Other personal factors include; gender, age and literacy level (Rashid, 2007).

Methods

The study population comprised of all the rural farmers in Karaye Local Government Area. Specifically, it involved the registered and literate rural farmers (those who could read and write) in the Karaye Local Government Area's ten wards. Record from the Department of Agriculture, Karaye Local Government Area, showed 1,279 registered rural farmers in the ten wards. Purposive sampling was adopted in the selection of both the wards and the sample size of the subjects. The selected wards were: Magajin-Gari; Tudun-Kaya and Tarawa, and a total of 121 registered rural farmers were used for this study. A questionnaire was used for the data collection. The questionnaire was administered by the researchers with the assistance of three agricultural extension workers.

Results and discussion

A total of 121 copies of the questionnaire were distributed, out of which 95 completed questionnaires were returned. The response

rate for the survey was 78.4%. The data collected were analysed and presented on the tables using frequencies and percentages.

Table 1 reveals that the rural farmers' significant mean access to agricultural information through mobile phones was short message service (SMS) 40 (42.1%). This may be due to the federal government programme of Growth Enhancement Scheme, delivering farm inputs to farmers through mobile phones. Adesina (2012) argued that farmers could have directed redemption of farm inputs through the e-wallet system-in which farm inputs information are directly sent to farmers

through text messages. The table also indicated that only 3 (3.2%) of the respondents, accessed agricultural information through voice calls. The findings show the low use of mobile phones by rural farmers to access agricultural information in Karaye Local Government Area (LGA). The table also shows that 1 (2.1%) of rural farmers in Karaye LGA used e-mail as a mean of accessing agricultural information. This finding is in line with that of Adomi et al., (2003), which found that few farmers had used the Internet and e-mail services for knowledge acquisition.

Table 1: Means of accessing agricultural information through mobile phones by rural farmers in Karaye Local Government of Kano State

S/N	Means of Accessing Agricultural Information	Frequency	Percentage
1.	Through short messages service (SMS)	40	42.1
2.	Through e-mail	22	23.2
3.	Through voice calls	3	3.2
4.	Through browsing	18	18.9
5.	Through multimedia services	12	12.6

Table 2 reveals that most farmers 65(68.4%) sourced agricultural information from their colleagues (other farmers) through mobile phones. This may be due to their closeness with their colleagues, especially leaders of the farmers' group. The finding also reveals that an insignificant number of farmers sourced agricultural information from agricultural researchers, and extension agents through mobile phones 11(11.6%), 17(17.9%) and 13(13.7%) respectively.

However, only 2(2.1%) farmers use their mobile phones to get agricultural information from the library. Moreover, the study shows that Karaye LGA farmers were not accessing agrarian information from the research institutes. This might be due to the absence of any research institutes in the area or lack of knowledge of the existence of any research institutes in Kano State or nearby states like Jigawa, Kaduna and Katsina states.

Table 2: Sources for accessing agricultural information through mobile phones by rural farmers in Karaye LGA

S/N	Sources of Agricultural Information	Frequency	Percentage
1.	From other farmers	65	68.4
2.	Research institutes	0	0.0
3.	Library	2	2.1
4.	Agricultural Researchers	11	11.6
5.	Agricultural Extension agents	17	17.9

Table 3: Responses to the challenges rural farmers face in accessing agricultural information through mobile phones

S/N	Challenges	Frequency	Percentage
1.	High call charges	11	11.6
2.	Inaccessibility to rural areas by the NGO	0	0.0
3.	The complexity of mobile phone technology	0	00
4.	Inadequate contact to extension agent	3	3.1
5.	Lack of sufficient and wide mobile phones network coverage in the communities	26	27.4
6.	Inadequate time to access agricultural information	5	5.3
7.	Lack of power supply to frequently charge mobile phones	1	1.0
8.	Frequent power failure to charge mobile phones	14	14.7
9.	Household commitments	5	5.3
10.	Inability to access agricultural information from the formal Sources (Research institutes, extension workers and the like.)	30	31.6

Table 2 shows that majority of the respondents, 30 (31.5%) indicated that the inability to access agricultural information

from the formal sources was the challenge they encountered. 26(27.4%) of the respondents meant a lack of sufficient and

wide mobile phone network coverage in the communities was also another challenge being faced. This finding corroborates with that of Aigbeakaen (2007) that the significant constraints in GSM (Mobile Phones) used by farmers were sufficient and broad network coverage. However, only 1 (1.0%) of the respondents indicated that lack of power supply to frequently charge mobile phones was the challenge they face in Karaye LGA.

Conclusion

Information is a dynamic entity inherent in the society that is both powerful and important in our complex modern society. An ever-widening range of agricultural activities depends on broad access and information through appropriate communication medium or tools. From the findings of this study, it could be concluded that agriculture is the significant economic activity of the rural farmers as engaged by Karaye LGA people in Kano State. With the timely provision and access to relevant agricultural information through mobile phones, Nigeria would achieve food sufficiency for its citizens. There is no gainsaying that mobile telephony is an essential device for accessing information looking at mobile phone subscriptions in Nigeria. And again, it aids in bridging the rural-urban digital and information divide.

Following the findings obtained from the study, it is recommended that:

1. The Federal Government of Nigeria should through the National Communication Commission (NCC) liaise with telecommunication companies to reduce the rate of call charges, so that rural farmer can make direct calls apart from Short Message Service (SMS) to extension workers or any other agricultural stakeholders to access agricultural information easily.
2. Farmers should be sourcing agricultural information from formal sources (research institutes,

researchers, and extension workers) apart from their colleagues (other farmers) to access relevant and up-to-date information that can help achieve sufficient food production and prevent poor harvest.

3. The formal sources of agricultural information should be made available and accessible to the farmers by the Kano State and Federal Government of Nigeria (via the local authorities). This can be done by providing adequate extension workers and establishing research institutes that would disseminate relevant and accessible agricultural information to farmers in rural areas.

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