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UTILISATION OF MOBILE PHONES BY RURAL FARMERS FOR AGRICULTURAL INFORMATION ACCESS AND USE IN KARAYE LOCAL GOVERNMENT AREA, KANO STATE, NIGERIA

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Abstract
Access to agricultural information continues to be challenging for rural farmers due to the use of inadequate sources and traditional extension approaches. The use of mobile phones to access appropriate agricultural information is an overriding factor for the attainment of successful and sufficient farm production and rural development, especially in developing nations. This research was conducted in Karaye Local Government Area of Kano State, Nigeria, to explore how farmers utilize mobile phones in accessing agricultural information. One thousand two hundred seventy-nine (1,279) registered rural farmers formed the population of this study. To better understand the relevance of utilizing mobile phones by rural farmers for farming systems, 127 farmers were surveyed in three (3) wards using a purposive sampling technique. Structured questionnaire was used to collect data, and descriptive statistics of frequencies and percentages were used to analyse and present the data. Information about herbicide control was the major type of agricultural information accessed through mobile phones for use by the rural farmers in Karaye Local Government; rural farmers utilised mobile phones to access agricultural information monthly and occasionally. The results also show that rural farmers benefit from utilising mobile phones in the areas of getting assistance in accessing agricultural information quickly and getting easy contact with local customers/suppliers. The study concludes that with timely access to relevant agricultural information by rural farmers, Nigeria can attain food sufficiency. Therefore, this study recommends that, rural farmers should not rely on information about pest and disease control but should also access other types of agricultural information such as information for better marketing, prices of agricultural products and also of new, improved seeds; rural farmers should make daily or weekly use of mobile phones to be updated on agricultural information and quick access to their needs.

Keywords: Access, Agricultural Information, Mobile Phones, Rural Farmers, Utilisation

Introduction

Agricultural information is crucial in enhancing farm productivity and facilitating poverty alleviation among rural farmers. Farmers require information on production and marketing and information to support their business operations (Zamani, Okwo, Dawang & Nakat, 2014; Parmar, Soni, Kuwornu and Salin (2019). The use of appropriate agricultural information is an overriding factor for the attainment of successful and sufficient farm production and rural development. Kaske, Mvena, and Sife (2018) corroborated the above assertion that Access to timely, accurate, and pertinent agricultural information is essential to bringing about significant improvement in farming production. This suggests that 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 a farmer's sufficient production. Despite the benefits of accessing timely and reliable agricultural information for farming activities, Nyamba (2017) expressed concern that farmers are faced with challenges of access to information sources, lack of trust in Short Message Services (SMSs), poor network signals, poor rural electrification and low digital literacy among mobile phone users.

Mobile phone is a necessity for rural farmers to reduce the cost of communication. Besides reducing the costs of communication and improving access to information, mobile phones are enabling technology for other innovations (Kikulwe, Fischer, and Qaim, 2014). Farmers' ability to communicate about agricultural trade, information sharing, and purchasing and selling inputs, farm commodities, crop production, and farm income from local to administrative levels has been facilitated by the use of mobile phones (Ogutu, 2014 and Gichuki and Mulu-Mutuku, 2018).

The use of mobile phones has increased rapidly in many developing countries and in rural areas. Besides reducing the costs of communication and improving access to information, mobile phones are an enabling technology for other innovations (Kikulwe, Fischer and Qaim, 2014). It is further asserted that the usage of mobile phones to get market information has increased hence, in many rural communities; farmers use their phones to communicate with nearby marketplaces and traders because the markets are typically far from the farms (Masuka et al., 2016).Most importantly, the use of a mobile phone requires' only basic literacy and, therefore, is accessible to a large portion of the population. Recent years have seen a rise in the use of mobile phone-based communication among all ICTs Rahman, Haque, and Afrad (2020). According to recent data, 4.68

billion people worldwide are projected to already owned mobile phone (Statista, 2019). As of December 2021, there are at least 195.4 million phone subscribers in Nigeria (Nigerian Communication Commission–NCC, 2022). With such fast growth in mobile telephony, mobile phones have become indispensable and facilitate agricultural information access and use by rural farmers**.** According to (NBS, 2016), the number of active voice subscriptions stood at 148.74 million at the end of Q1 2016. Kano State with7.81 million (5.25%); NBS further reported that Kano was one of the states that had the most mobile subscribers in Nigeria. The National Bureau of Statistics (NBS, 2022)report indicated that Kano had 12.6 million subscribers in terms of active voice. Although, the NBS did not present the report of the mobile subscription based on the 44 local government area and how the mobile phones are being utilized on different sectors of economy in Kano State. However, this study used Karaye Local Area as a case study to fill in the gap that exists on how farmers utilise mobile phone to access agricultural information. Karaye is one out of the 44 Local Governments in the state. It has an area of 479 km^2 and a population of 141,407 at the 2006 census. Karaye is the home of Challawa Gorge Dam. It is a major reservoir on the Challawa River, a tributary of the Kano River, which is the main tributary of the Hadejia River for agricultural production.

In recognition of the significance of communication devices in agricultural activities, the Nigerian government established policies and projects in this area, including the Growth Enhancement Support Scheme (GES), which was created to deliver government-subsidized farm inputs directly to the farmers via mobile phones, and the Global System of Mobile (GSM) communication, which made phone lines more accessible nationwide. This means that the mobile phone is a vital communication device for farmers and can be used to access agricultural information using different features of mobile phones such as multimedia Services, Short Message Services, e-mail, and voice calls. Communications in agriculture have undergone revolutionary changes as a result of the various usages of mobile phones. These days, mobile phones are a crucial and well-liked mode of communication for getting access to agricultural information such as pre-farming, farming, harvesting, and post-harvesting preparations (Marketing and transport) Afrad, Rahman, and Haque (2020).

Statement of the Problem

As mobile phone 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, Siong and Binsham, 2009).

Even though the use of mobile phones offer opportunities for improved access to agricultural information and sufficient foods production, observation and preliminary investigation by the researchers revealed that rural farmers were inherently imprisoned by a poor harvest and insufficient food production; this situation has serious consequences on the country's economy and lives of the citizenry such as poverty, rural-urban migration, food scarcity, hunger and untimely death. According to the Nigeria National Population Commission (2004), the majority of farmers are resource-poor peasants who cultivate an average of two hectares of land, typically on dispersed holdings with low and declining productivity. Could this problem be attributed to the poor utilisation of mobile phones for accessing and utilizing agricultural information? It is against this backdrop, that this research was set out to investigate the utilisation of mobile phones by rural farmers for agricultural information access and use in Karaye Local Government Area, Kano State.

Objectives of the Study

The study centered on the following objectives:

1. To find out the types of agricultural information accessed through mobile phones by the rural farmers in Karaye Local Government Area, Kano State.
2. To determine the extent of utilisation of mobile phones to access agricultural information by rural farmers in Karaye Local Government Area.
3. To ascertain the benefits of utilising mobile phones in accessing agricultural information by the rural farmers.

Review of Related Literature

Mobile phones are undoubtedly among the main instruments that can help rural communities significantly ease the communication process, and the agricultural communities are encouraged to utilise them wisely. It has a significant role to play in agricultural information access and use. In a research carried out by Martin (2011), mobile phones and rural livelihoods.

A study on Pakistani farmers' use of mobile phones to access agricultural information was undertaken by Khan et al. in 2019. According to the study's findings, 91.2% of farmers reported owning a cell phone. Furthermore, it was revealed that 87.20% of the farmers employed private sector advisory staff to get information about agriculture. Hamad, Eltahir, Ali, & Handam (2019) discovered that rural farmers used mobile phones to get information concerning how to plan

for success season; information relevant to agricultural practices; information for building and empowering farmer organisation; information for the farmer to diversify crops and land, enhance the adoption process and information to avoid crops losses. The most rated advantages of using a mobile phone were reportedly easy access to current information and connectivity with stakeholders.

Similarly, Hamid et al (2019) reported that farmers derived benefits from utilising mobile phones in the areas of quick access to logistic support; quick access to extension offices; quick information about pests and diseases, quick access to police, short way to labour; enhance remote marketing; facilitate administration and managerial issues; photographing, agricultural aspects and phenomena; socialisation among farmers; and ease communication between farmers, traders and end-users. The cost of transport has decreased, and farming groups in remote locations are now more productive. Due to the mobile phone's flexibility, affordability, and user-friendliness compared to other ICT tools, it has greatly spread even into the underserved and underprivileged farming communities (Osabutey and Jin, 2016).

According to Samuel, Shah and Hadingham (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. 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).

Research Methodology

The study population comprised 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. These wards were

purposively selected because they have highest number of registered farmers and mobile network services. A total of 121 copies of the questionnaire were distributed, out of which 95 completed questionnaires were returned.

Data Analysis

The response rate for the survey was 78.4%. The data collected were analysed and presented in the tables using frequencies and percentages. Since the data was presented using frequency count and percentage, thus, the criteria used to accept the results was the items responded with the highest number of frequency and percentage in each of the three wards used in Karaye Local Government Area. The tables below present the results of the data collected and analysed.

Table1: Types of Agricultural Information Accessed through Mobile Phones

S/N	Types of Agricultural Information	Wards						Total	
		Magajin-Gari		Tudun-Kaya		Turawa			
		F	%	F	%	F	%	F	%
1.	Information about better marketing and prices of agricultural products	8	17.0	6	26.0	0	0.0	14	14.8
2.	Information about agricultural pest and diseases control	3	6.3	2	8.6	0	0.0	5	5.2
3.	Information about the method of herbicide control	7	14.8	11	47.8	12	48.0	30	31.6
4.	Information about farming systems	0	0.0	0	0.0	3	12.0	3	3.2
5.	Information about new and improved seeds	1	2.1	0	0.0	0	0.0	1	1.0
6.	Information about drought resistant crops	2	4.2	3	13.0	21	84.0	26	27.4
7.	Information about credit facilities	5	10.6	4	17.3	2	8.0	11	11.6
8.	Information about soil fertility	0	0.0	0	0.0	0	0.0	0	0.0
9.	Information about soil erosion control	0	0.0	0	0.0	0	0.0	0	0.0
10.	Information about harves t management	0	0.0	0	0.0	5	20.0	5	5.2
11.	Information about livestock management	0	0.0	0	0.0	0	0.0	0	0.0

Table 2: Extent of Use of Mobile Phones to Access Agricultural Information

S/N	The extent of the Use of Mobile Phones	Wards of the Respondents									Total
		Magajin-Gari			Tudun-Kaya			Turawa			
		A	D	U	A	D	U	A	D	U	
		F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	
1.	I use my mobile phone to access agricultural information daily	25 (26.3)	20 (21.1)	2 (2.1)	11 (11.6)	8 (8.4)	4 (4.2)	14 (14.7)	8 (8.4)	3 (3.2)	95 (100)
2.	I use my mobile phone to access agricultural information weekly	26 (27.4)	18 (18.9)	3 (3.2)	12 (12.6)	9 (9.5`)	2 (2.1)	15 (15.8)	8 (8.4)	2 (2.1)	95 (100)
3.	I use my mobile phone to access agricultural information monthly	35 (36.8)	9 (9.5)	3 (3.2)	15 (15.8)	5 (5.3)	3 (3.2)	15 (15.8)	7 (7.4)	3 (3.2)	95 (100)
4.	I use my mobile phone to access agricultural information occasionally	33 (34.7)	10 (10.5)	4 (4.2)	13 (13.7)	8 (8.4)	2 (2.1)	20 (21.1)	2 (2.1)	3 (3.2)	95 (100)
5.	I use my mobile phone to access agricultural information forthrightly	28 (29.4)	15 (15.8)	4 (4.2)	10 (10.5)	10 (10.5)	3 (3.2)	13 (17.7)	9 (9.5)	3 (3.2)	95 (100)
6.	I use my mobile phone to access agricultural information annually	25 (26.3)	20 (21.1)	2 (2.1)	11 (11.6)	8 (8.4)	4 (4.2)	21 (22.1)	3 (3.2)	1 (1.1)	95 (100)
7.	I use my mobile phone to access agricultural information frequently	28 (29.4)	13 (13.7)	6 (6.3)	14 (14.7)	5 (5.3)	4 (4.2)	18 (18.9)	4 (4.2)	3 (3.2)	95 (100)

Key: A=Agree, D=Disagree, U=Undecided

Table 3: Benefits of Mobile Phones in Accessing Agricultural Information

S/N	Benefits of Mobile Phone	Wards of the Respondents									Total
		Magajin-Gari			Tudun-Kaya			Turawa			
		A	D	U	A	D	U	A	D	U	
		F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	
1.	Helps to easily send a request on agricultural information anytime the need arose	23 (24.2)	20 (21.1)	4 (4.2)	10 (10.5)	8 (8.4)	5 (5.3)	15 (15.8)	7 (7.4)	3 (3.2)	95 (100)
2.	Reduces the need to travel	8 (8.4)	23 (24.2)	16 (16.8)	11 (11.6)	9 (9.5`)	3 (3.2)	2 (2.1)	17 (17.9)	6 (6.3)	95 (100)
3.	Promotes interpersonal relationships	19 (20.0)	13 (13.7)	12 (12.6)	18 (18.9)	1 (1.2)	4 (4.2)	12 (12.6)	11 (11.6)	2 (2.1)	95 (100)
4.	Assist in accessing agricultural information quickly	32 (33.7)	6 (6.3)	9 (9.5)	11 (11.6)	8 (8.4)	4 (4.2)	12 (12.6)	6 (6.3)	7 (7.4)	95 (100)
5.	Increase the income of the people in the community	14 (14.7)	18 (18.9)	15 (15.8)	14 (14.7)	9 (9.5)	0 (0.0)	7 (7.4)	13 (13.7)	5 (5.3)	95 (100)
6.	Enhance strong social cohesion	18 (18.4)	11 (11.6)	18 (18.9)	13 (13.7)	9 (9.5)	1 (1.1)	7 (7.4)	4 (4.2)	14 (14.7)	95 (100)
7.	Allow more contacts amongst farmers	13 (13.7)	17 (17.9)	17 (17.9)	11 (11.6)	8 (8.4)	4 (4.2)	10 (10.5)	9 (9.5)	6 (6.3)	95 (100)
8.	Easy contact with local customers/suppliers	32 (33.7)	3 (3.2)	12 (12.6)	13 (13.7)	6 (6.3)	4 (4.2)	11 (11.6)	9 (9.5)	5 (5.3)	95 (100)
9.	Easy to get in touch with fellow farmers	21 (22.2)	18 (18.9)	8 (8.4)	18 (18.9)	2 (2.1)	3 (3.2)	10 (10.5)	7 (7.4)	8 (8.4)	95 (100)

Key: Agree, A=Agree, D=Disagree and U=Undecided

Discussion of Finding

Table 1 shows that the majority of the respondents, 30 (31.6%), indicated that the types of agricultural information they accessed through mobile phones were information about herbicide control and information on drought-resistant crops. That may be a result of the low level of farmers' income that can help in employing some labour force. However, only 1(1.0%) of the respondents showed information they accessed through mobile phones was information about new and improved seeds. Therefore, poor harvest experienced by farmers may be the result of unimproved seeds being planted for a decade by farmers. Improved seeds will help farmers to achieve higher productivity.

Table 2 shows the responses of the rural farmers with regard to the extent of use of the mobile phone. In their responses, 35 (36.8%), 33 (34%) from Magajin-Gari, 15 (15.8%), 13 (13.7%) from Tudun-Kaya and 15 (15.8%), 20 (21.1%) from Turawa agreed that the used mobile phone to access agricultural information monthly and occasionally respectively. This finding agreed with the finding of Eamin Ali Akanda and Roknuzzaman (2012), which showed that farmers sometimes depend on mobile in order to get information. However, the table showed that only 1 (1.1%) of the respondent chose undecided that mobile phones were used to access agricultural information annually. It can be deduced from the finding of this study that there was low and untimely use of mobile phones by the rural farmers to access and utilise agricultural information for their agricultural production

Table 3 revealed that the majority of the respondents agreed that the benefits of utilising mobile phones were to assist in accessing agricultural information quickly, provide easy contact with local customers/suppliers, make it easy to get in touch with fellow farmers and Promote interpersonal relationships with 32 (33.7) from Magajin-Gari, 18(18.9) from Tudun Kaya, 13 (13.7%) from Turawa respectively. However, only 2 (2.1%) of the respondents indicated that they disagreed with the benefit of utilising a mobile phone was easy to get information from fellow farmers. Lehr (2007) asserts that mobile phones are transforming the lives of many users in developing countries and are widely recognised as an important, current and future technology platform for developing nations. This indicated the need for research of this kind to investigate the utilisation of this device. There have been quite a few studies that explored how mobile phones impact the livelihoods of farmers (Rashid and Elder, 2009).

Conclusion

Information is a dynamic entity inherent in 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 mediums 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 the 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.

Recommendations

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

1. Rural Farmers should not rely on information about pest and disease control only but should also access other different types of agricultural information, such as information for better marketing and prices of agricultural products and also of new, improved seeds. This can be done through relevant agricultural research institutes and extension workers' awareness campaigns.

2. They should make daily or weekly use of mobile phones to access and utilise agricultural information to have to update agricultural information, which is possible with the apparent development in this information and communication technology age.

3. The rural farmers in Karaye Local Government should ensure that they stick to the utilisation of mobile phones to benefit more in accessing agricultural information quickly and provide easy contact with local customers/suppliers.

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