

Comparative Study on the Mobile Media Platforms Adopted By Farmers for Mobile-Based Agricultural Information and Communication in South-East Nigeria

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ABSTRACT

The adoption of mobile-based agriculture extension has transformed agricultural extension communication globally. This study seeks to ascertain the mobile media platforms adopted by farmers for agricultural information and dissemination in Anambra State, Enugu State, Abia State, Ebonyi State and Ebonyi State in South-Eastern part of Nigeria. The study adopted structured questionnaire as instrument for data collection and the data collected were analysed using descriptive statistical approach with statistical package for social science (SPSS) analytical tool. The data gathered from farmers in South-East Nigeria shows that WhatsApp (35.2%) is the most commonly used platform, SMS users are (26.5%), while Facebook accounts for (17.6%) of the responses, and 20.7% of the respondents do not use any platforms. WhatsApp (32.8%) is discovered to deliver the fastest response to agricultural inquiries, Facebook accounts for (27.3%), while SMS is (18.1%); no respondent selected USSD (0%). The distribution shows that WhatsApp and Facebook jointly accounts for 60.1% of the responses, while SMS represents 18.1%, with 21.8% respondents indicating no platform. The result also reveals that only (35.4%) have received agricultural extension messages from either government or NGOs, while (64.6%) affirmed negatively. (50%) of the respondents communicated directly with extension workers through WhatsApp (40.1%); SMS (26.5%); Facebook (12.9%); while (20.5%) of the respondents do not use any platform for direct communication with the extension workers; no respondent selected USSD (0%). On the reliability of the mobile platforms, data gathered indicated that Facebook (21%) and WhatsApp (32.3%) are the most reliable platform for extension-related information, SMS accounted for (22.8%) respondents, while no respondents relied on USSD and 23.4% of the respondents indicated that none of the platforms is reliable. The overall result reveals that (76.4%) agreed that they belong to mobile-based farmers group while (23.6%) do not.

Keywords: Digital media, South-East Nigeria Farmers, agricultural platform, agricultural information, WhatsApp, SMS, Facebook, USSD

INTRODUCTION

Mobile-based communication (MBC) has emerged as a critical component of contemporary information and communication technologies (ICTs), particularly in developing economies where mobile phone penetration has expanded more rapidly than other digital infrastructures. Broadly, mobile-based communication refers to the use of mobile devices and associated platforms, such as voice calls, short message service (SMS), unstructured supplementary service data (USSD), mobile applications, and internet-enabled messaging services, to exchange information, facilitate interaction, and support decision-making processes. In the agricultural context, MBC functions as a channel through which farmers access agronomic information, weather forecasts, market prices, pest and disease alerts, and extension advisories in a timely and location-specific manner (Aker, 2011; Ezeomah, 2019). Unlike traditional mass media or face-to-face extension methods, mobile-based communication enables continuous, personalized, and interactive information exchange, thereby reshaping how agricultural knowledge is produced, disseminated, and utilized within farming communities.

The integration of mobile-based communication into agricultural extension represents a significant departure from conventional extension systems that rely heavily on physical visits, group demonstrations, and print or broadcast media. Traditional extension approaches in many developing countries, including Nigeria, have been constrained by inadequate funding, high farmer-extension agent ratios, poor rural accessibility, and delays in information delivery. Mobile-based communication has helped to mitigate these structural limitations by extending the reach of extension services beyond spatial and temporal barriers, allowing extension agents to communicate with large numbers of farmers simultaneously and at lower cost (World Bank, 2012; Abubakar, *et al.*, 2023). Through mobile platforms, extension messages can be disseminated rapidly and repeatedly, enhancing farmers' exposure to improved practices and reinforcing learning over time. This shift has repositioned extension from a predominantly top-down, episodic process to a more responsive and demand-driven system in which farmers actively seek information and feedback (Davis & Sulaiman, 2014; Fabregas, *et al.*, 2019).

Agriculture, no doubt, has contributed to the socio-economic development of some under-developed and developing countries of the world. The practice has served as major source of food, employment and raw material for industries. These opportunities that abound in agriculture have made it even more important to look at ways of increasing agricultural productivity, especially among subsistence farmers and smallholder farmers whose agricultural productivity remains low in many regions due to factors such as climate variability, poor infrastructure, inadequate access to information, kind of information received, and weak linkages between farmers and technologies (IFAD, 2010; Chapman & Slaymaker, 2002).

The relationship between mobile-based communication and farmers' productivity has made farmers not only to receive information but also to ask questions, report challenges, and share experiential knowledge with extension agents and fellow farmers. This interactivity enhances the relevance and contextualization of extension content, as advice can be tailored to specific crops, seasons, ecological conditions, and farmers' capacities (Mittal & Mehar, 2016; Mwangi, *et al.*, 2025). Furthermore, mobile platforms facilitate horizontal communication among farmers, fostering peer learning and social reinforcement that are crucial for sustained adoption of innovations. In this sense, mobile-based communication strengthens both formal

and informal knowledge networks within agricultural systems, contributing to more inclusive and participatory extension processes.

Empirical studies across sub-Saharan Africa and other developing regions consistently demonstrate a positive association between mobile-based communication and agricultural productivity. Research indicates that farmers who actively use mobile phones for agricultural information tend to adopt improved technologies more rapidly, achieve higher yields, and record better income outcomes than those without access to such services (Aker, 2020; Fu & Aker, 2016). These findings reinforce the argument that mobile-based communication serves as a strategic extension tool that enhances knowledge acquisition, strengthens decision-making, and ultimately improves farm productivity. In this context, MBC is increasingly viewed not simply as a communication medium, but as an integral component of modern agricultural development strategies aimed at achieving food security and sustainable livelihoods.

In Nigeria, there has been a remarkable increase in mobile agriculture communication over the past two decades, which has improved farmers' productivity. Government agencies, Non-Government organizations (NGO), and private-sectors have promoted agriculture through mobile based communication. Initiatives such as SMS information systems, and social media platforms have expanded the availability of agricultural information among rural farmers (Federal Ministry of Agriculture and Rural Development (FMARD 2022; Obayelu *et al.*, 2022). This study tends to ascertain the mobile media platforms adopted by farmers and their level of adoption for agricultural information and dissemination in Anambra State, Enugu State, Abia State, Ebonyi State and Ebonyi State in South-Eastern part of Nigeria.

Material and Methods

2.1 Research Design

The design adopted for this study is the descriptive survey design with quantitative approach. The approach involves the use of Questionnaire and results were analyzed using SPSS tool.

2.2 Area of the Study

The five states in South-East geopolitical zone of Nigeria were considered for this research. The states are; Abia, Anambra, Ebonyi, Enugu, and Imo.

2.3 Sample Size

The sample size of this study was 385 from a study population of 664,240. This study adopted the Meyer formula to determine the sample size for this study as shown in equation 1.

$$R = \frac{I \times S}{N}$$

Where R = Number of respondents allotted to each State

I = Resident population of each State

N = Total population of the five States sampled

S = Sample size

2.4 Sampling Technique

Purposive Sampling was applied. The choice of this sampling technique was necessary because the targeted respondents are farmers.

2.5 Measurable variables

The independent variables of this study were the typical basic socio-demographic variables such as age, gender, marital status, educational level, and State of residence while the major dependent variable that will be used to elicit data is:

Mobile Media Platforms Adopted By Farmers for Agricultural Information and Dissemination: This measured the mobile media platforms adopted by farmers and their level of adoption for agricultural information and dissemination in Anambra State, Enugu State, Abia State, Ebonyi State and Ebonyi State in South-Eastern part of Nigeria

2.6 Method of Data Analysis

The researcher analyzed collected data from this study, using frequency tables, simple percentages and the Statistical Package for the Social Sciences (SPSS) version 21 for data analysis

3.0 Result and Discussion

3.1 Demographic Variables

Six demographic variables were measured via age, sex, marital status, educational qualification, and number of years as a farmer, state of residence.

Response Rate

381 representing 98.9% were correctly filled and retrieved, while 4 representing 1.0% were not. Thus, 99% response rate was recorded as against 1.0% casualty rate.

Table 1: Demographic Variables

Variables	Item	Frequency	Percentage
Sex	Male	235	62
	Female	146	38
	Total	381	100
Education Qualification	No Education	29	7.6
	Basic Education	151	39.6
	(FSLC/SSCE)	106	27.8
	OND/NCE/Diploma	61	16
	First Degree/HND	34	9
	Postgraduate Qualification		
	Total	381	100
Years of experience	Below 5 years	87	22.8
	5 – 10 years	49	12.9
	11 – 15 years	137	36
	Above 15 years	108	28.3
	Total	381	100
State of respondents	Anambra	93	24.5
	Enugu	47	12.3
	Ebonyi	107	28.1
	Imo	63	16.5
	Abia	71	18.6
	Total	381	100
Age	20-40years	173	45.4
	41years and above	140	36.7
	Missing	68	17.8
	Total	381	100

Source: Field survey data, 2026.

Table 1 presents demographic data of respondents. It shows the percentage of farmers and their ages and was determined based on valid responses (313), 17.8% did not indicate their age and were treated as missing. The data in table 1 shows that male respondents were higher than female respondents. This is an indication that men dominate in farming and land ownership which support the existing socio-cultural and structural realities in the agricultural sector. Furthermore, 7.6% of the respondents had no formal educational qualification, 39.6% had basic education (FSLC/SSCE) as their highest qualification; 27.8% held OND/NCE/diploma; 16% held first degree/HND; while 9.0% held postgraduate qualifications. Thus, first (FSLC/SSCE) was the modal qualification while no formal education was the least occurring qualification. In terms of length of farming experience, 245 respondents had above ten years farming experience which implies that the respondent can adequately enumerate factors that impede the adoption of mobile media for agricultural information and dissemination.

3.2 Mobile media platforms adopted by farmers

There are different mobile media platform of which majority are social media platforms where farmers access agricultural information and interact with peers and experts. This studies investigated the various media/platform farmers in south-east use to access agricultural information and support services as found in Table 2.

Table 2: Mobile media platforms adopted by farmers

State	WhatsApp	SMS	Facebook	USSD	None	Total
Anambra	33	25	16	0	19	93
Enugu	17	12	8	0	10	47
Imo	22	17	11	0	13	63
Abia	25	19	12	0	15	71
Ebonyi	37	28	23	0	19	107
Total	134	101	70	0	76	381

Source: Field survey data, 2026.

Table 2 shows that WhatsApp is the most preferred platform for agricultural extension communication with a total of 134 respondents, followed by SMS (101 respondents) and Facebook (70 respondents) while USSD was not used by any respondent. The proportion of respondents who are using none of the platforms (76 respondents) shows that few farmers still adopt the traditional approach for agricultural information and dissemination. These respondents could state factors that impede the adoption of mobile base agriculture extension and communication.

3.3 Digital Media Platforms Farmers Use for Agricultural Extension

This section presents data showing the digital media platforms farmers use for agricultural extension. The data are segmented into two: access to digital media and usage of digital media platforms for agricultural extension. The two sets of data are presented in Tables 3 and 4 respectively.

Table 3: Distribution of Responses showing the digital media platforms farmers use for agricultural extension.

Do you use a mobile phone to access agricultural information or advice?	How often do you receive agricultural information through mobile platforms?	Which of these mobile-based platforms do you currently use to receive agricultural extension information? (Select all that apply)	Which platform do you use the most frequently for agricultural extension?	Did you start using any of these platforms because of their usefulness in agriculture?
Yes 289--75.8%	Daily 140 36.7%	SMS 101 26.5%	SMS 113 29.7%	Yes 190 49.9%
No 92—24.1%	Weekly 89 23.4%	WhatsApp 134 35.2%	WhatsApp 119 31.2%	No 168 44.1 %
	Occasionally 67 17.6%	Facebook 67 17.6%	Facebook 68 17.8%	Missing 23 6%
	Never 85 22.3%	USSD - 0%	USSD --- 0%	
		None 79 20.7	None 81 21.3%	
Total 381 100%	381 100%	381 100%	381 100%	381 100%

Table 3 presents data on the respondents' use of digital media for agricultural extension. Figures in the table indicate that majority of respondents have phones which is one of the requirement for adoption of digital agricultural extension, thus 289 respondents (75.8%) reported that they use mobile phones to access agricultural information or advice, while 92 respondents (24.1%) indicated that they do not use mobile phones for such purposes. These figures show that a significant majority of the farmers utilize mobile phones as a channel for agricultural information dissemination. The implication is that mobile technology has become an important tool for agricultural extension communication among farmers. However, the fact that over one-fourth of the respondents (24.1%) do not use mobile phones for agricultural

information suggests that some barriers may still exist. Data further reveal how frequently farmers receive agricultural information through mobile platforms; (36.7%) received on daily basis, (23.4%) weekly, (17.6%) occasionally while (22.3%) never received at all. This distribution indicates that nearly half of the respondents receive agricultural information daily, suggesting that mobile platforms provide continuous and timely access to extension services. The weekly and occasional users (41%) also demonstrate moderate engagement with digital agricultural communication channels. However, (22.3%) never received such information through mobile platforms, indicating that certain farmers may still rely on traditional extension methods such as face-to-face communication and radio broadcasts.

On the mobile-based platforms farmers use for agricultural extension: the findings reveal that WhatsApp (35.2%) and SMS (26.5%) constitute the most commonly used platforms, while Facebook accounts for (17.6%) of the responses, and 20.7% of the respondents do not use any platforms. On the most frequently used mobile platforms; (29.7%) SMS; (31.2%) WhatsApp; (17.8%) Facebook; while (21.3%) of the respondents indicated that they do not use any of the platforms. On the perceived usefulness of the mobile platforms; (49.9%) continued using the platforms because of the perceived usefulness; (44.1%) responded negatively indicating that not all farmers perceive mobile platforms as beneficial.

Table 4 Distribution of Responses showing the digital media platforms farmers use for agricultural extension.

Which platform delivers the fastest response or feedback when you make agricultural inquiries?	Do you belong to any mobile-based farmer groups or forums that discuss agriculture?	Which mobile-based platform do you find most reliable for extension-related information?	Have you ever received agricultural extension messages from government or NGOs through your mobile phone?	Which of these platforms do you use to communicate directly with extension workers or agricultural agents?
SMS 69 18.1% WtA 125 32.8% FB 104 27.3% USSD -- 0% None 83 21.8%	Yes 291 76.4% No 90 23.6%	SMS 87 22.8% WhatsApp 125 32.8% Facebook 80 21% USSD -- 0% None 89 23.4%	Yes 135 35.4% No 246 64.6%	SMS 101 26.5% WhtAp 153 40.1% Facebk 49 12.9% USSD -- 0% None 78 20.5%
Total 381 100%	381 100%	381 100%	381 100%	381 100%

Source: Field survey data, 2026.

Table 4 presents data on the usage of digital media platforms for agricultural extension by farmers. Figures in the table indicate that WhatsApp (32.8%) delivers the fastest response to agricultural inquiries, Facebook accounts for (27.3%), while SMS is (18.1%); (21.8%) indicated non and no respondent selected USSD (0%). The distribution shows that WhatsApp and Facebook jointly accounts for 60.1% of the responses, while SMS represents 18.1%, with 21.8% respondents indicating no platform. Furthermore, the table reveals that (76.4%) agreed that they belong to mobile-based farmers group while (23.6%) do not. On the reliability of the mobile platforms, data indicate that Facebook (21%) and WhatsApp (32.3%) are the most reliable platform for extension-related information, SMS accounted for (22.8%) respondents, while no respondents relied on USSD and 23.4% of the respondents indicated that non of the platforms is reliable. The figures from the table also reveal that only (35.4%) have received agricultural extension messages from either government or NGOs, while (64.6%) affirmed negatively. (50%) of the respondents communicated directly with extension workers through

WhatsApp (40.1%); SMS (26.5%); Facebook (12.9%); while (20.5%) of the respondents do not use any platform for direct communication with the extension workers; no respondent selected USSD (0%).

Table 5: Cumulative distribution of respondents' level adoption of digital media platforms for agricultural extension.

Level of adoption	Indicators	Frequency	Percentage
High adoption	Daily access to information and active use of platforms (e.g., WhatsApp, SMS), Group membership	140	36.7%
Moderate adoption	Weekly access and regular engagement with mobile platforms	89	23.4%
Low adoption	Occasional access and limited interaction with platforms	67	17.6%
No adoption	No use of mobile platforms or never received agricultural information	85	22.3%
Total		381	100

Source: Field survey data, 2026.

To provide a clearer overall picture of respondents' level of adoption, data in Tables 3 and 4 are further summarised in Table 5 which gives a cumulative summary of respondents' level of adoption of digital media platforms for agricultural extension. The table was derived by aggregating responses across multiple indicators such as frequency of use, platform engagement and communication behaviour. The findings reveal that a majority of respondents (36.7%) fall within the high adoption category, indicating strong engagement with mobile-based agricultural information systems. About (23.4%) demonstrate moderate adoption, while (17.6%) shows low adoption. However, a notable proportion (22.3%) still exhibit no adoption, suggesting a digital gap among some farmers, meaning that while mobile-based extension services are widely adopted, disparities in access and usage still persist.

The findings indicated that farmers in South-East Nigeria adopted multiple digital media platforms for agricultural extension communication, WhatsApp, SMS and Facebook emerging as the most widely adopted platforms among the respondents. The findings from this study reveal that the predominance of these platforms suggests that farmers increasingly depend on mobile-based communication technologies for accessing agricultural information, interacting with extension agents and sharing farming experiences. The high utilisation of WhatsApp observed in this study may be attributed to its multimedia and interactive features which enable farmers and extension officers to exchange voice notes, pictures, videos and real-time messages relating to pest outbreak, fertilizers application, weather conditions and farming techniques. This finding resonates with the outcome of previous studies such as Akar (2011) and Ogunniyi, & Ojebuyi, (2020) which established that mobile communication technologies significantly improve information flow between extension providers and rural farmers. The finding also agrees with Mittal & Mehar (2012), who observed that mobile phones and social networking platforms facilitate timely access to agricultural information and improve farmers' decision-making processes. Similarly, the prominence of SMS as revealed in the findings supports earlier studies that identified text messaging as one of the

most accessible and cost-effective channels for disseminating agricultural information, especially among rural farmers with limited access to smartphone and internet connectivity. The finding aligns with the work of Ogunniyi & Ojebuyi (2016), who reported that SMS-based agricultural communication remains effective in reaching farmers in remote areas because of its compatibility with basic mobile devices. The widespread adoption of WhatsApp, SMS and Facebook among farmers therefore reflects the perceived usefulness and relative advantage.

CONCLUSION

This study ascertained the mobile media adopted by farmers, and their level of adoption for Mobile-based agricultural extension in South-East Nigeria. The findings show that farmers in Anambra, Abia, Imo, Enugu and Ebonyi states adopted SMS, Facebook, WhatsApp to receive agricultural information which is an indication that mobile technology has become an important tool for agricultural extension communication among farmers. However, the study discovered that farmers in South-East do not share Agricultural information via USSD which suggests that some barriers may still exist. The research further revealed that farmers receive agricultural information on daily and weekly basis due to its perceived usefulness. Among the mobile platform, WhatsApp is the most adopted and most reliable platform because of its interactive features, it also delivers the fastest response to agricultural inquiries among farmers, between farmers and Non Governmental Organization (NGO) and between farmers and Government.

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