

THE BENEFIT OF MOBILE PHONE USE IN COMMUNICATING AGRICULTURAL INFORMATION TO FARMERS IN ETCHE LOCAL GOVERNMENT AREA, RIVERS STATE

Harry A.T., Stanley, O. and Otto, C.B.
Department of Agricultural Extension and Rural Development,
Rivers State University, Port Harcourt, Nigeria.

**Author for Correspondence: Email:harryariamebo@yahoo.com*

ABSTRACT

The study was to assess the benefit of mobile phone use in communicating Agricultural information to farmers in Etche Local Government Area of Rivers State. The study arose from the fact that, while information is becoming an important ingredient in Agriculture, farmers in Etche lack access to Agricultural information some time which greatly constraint effort to improve Agricultural development. Specifically, describe the socio-economic characteristics of the farmers in the study area, ascertain the awareness of mobile phone use for agricultural information in the study area, examine the area of mobile phone to communicate agricultural information in the study area, identify the benefit of mobile phone use to communicate agricultural information in the study area and identify the constraint associated with the use of mobile phone in the study area. One null hypothesis was also formulated to test the relationship between the socio-economic characteristics of the farmers and the benefit of mobile phone use in communicating agricultural information to farmer. Purposive random sampling technique was used to select a sample of 144 farmers. The collected data were subjected to descriptive and inferential statistical analysis. The results of the study showed that 41.67% of the farmers are between the ages of 20-30 years, 28.47% had primary education, 47.92% are married, 36.8% had farming experiences between 11-20 years and 41.67% had monthly income of ₦21000-₦30000. On the level of mobile phone awareness, 40.0% of the farmers strongly agreed that Mobile phone helps them to get agricultural information that will increase productivity or yield. Majority of the farmers are involved in mixed farming. However, major constraints faced by farmers include inadequate or poor infrastructure ($x=2.65$), poor network signal ($x=2.69$) and high cost of mobile phone and running ($x=2.84$). The hypothesis was tested using correlation analysis, the results reveals the following age ($r=0.041$; $p<0.05$), the educational qualification ($r=0.01$; $p<0.05$), marital status ($r=0.602$; $p<0.05$), occupation ($r=0.045$; $p<0.05$) and household size ($r=0.18$; $p<0.05$) which shows there was significant relationship between role of mobile phone use and socio economic characteristics of the farmers as the coefficient of the correlation(R) was 0.896 indicating 89.6% of strength relationship between the variable. Based on the findings of the study, some recommendations are given that extension agents should be used to create more awareness on mobile phone use among the farming communities, identify barriers preventing farmers to use new information sources and to educate them on the use of modern agricultural information as source of improving their productivity.

Keywords: Benefits, Mobile Phone, Communicating Agricultural Information and Farmers

INTRODUCTION

Sustainable agricultural systems requires research-based agricultural practices that rely on advanced mobile phone technology to share and transfer agricultural knowledge. Using suitable tools to disseminate information is vital to sustainable agricultural development in the 21st century (Ashraf et al., 2018; Kumar and Karthikeyan, 2019). As the worldwide population is expected to grow up from 7.6 billion in 2018 (Department of Economic and Social Affairs 2019), to more than 9.7 billion in 2050, the requirement for food will rise significantly (Department of Economic and Social Affairs, 2017). The dissemination of information and communication technologies (ICTs) in developing countries provides much opportunity to transfer knowledge and information by private companies and government department. Few years ago, mobile phone coverage has been spreading fast in Asian, African and Latin American countries. It was indicated that more than sixty per cent of the population of sub-Saharan Africa, Asia and Latin America had access to mobile phone coverage in 2009. In the past the adoption of the mobile phones was primarily by rich people residing in urban areas. Nowadays mobile phones have been adopted by rural and urban populations in developing countries and getting a good benefit and latest information regarding weather, market and other related issues (Aker and Mbiti, 2010). Mobile phone significantly have reduced communication and information costs for the rural people and has provided new opportunities for rural farmers to obtain knowledge and information about agricultural issues, problems and its usage for the development of agriculture. Similarly, use of ICTs in agricultural extension services especially mobile phone services in the agricultural sector has provided information on market, weather, transport and agricultural techniques to contact with concern agencies and department (Aker, 2011).

Objectives of the Study

The broad objective of the study was to assess the Benefit of Mobile Phone Use in Communicating Agricultural Information to farmers in Etche Local Government Area of Rivers State.

The specific objectives of the study were to;

- i. Describe the socio-economic characteristics of the farmers in study area.
- ii. Ascertain the awareness of mobile phone use for agricultural information study area.
- iii. Examine the areas of mobile phone to communicate agricultural information in the study area.
- iv. Identify the benefits of mobile phone to communicate agricultural information in the study area.
- v. Ascertain the constraints associated with the use of mobile phone in the study area.

LITERATURE REVIEW

Theoretical Framework

The concern of the communication specialist is to describe what is involved when people attempt to convey to others what is in their minds, which facilitates the process and what interferes with it. The theories of communication abound to the extent that no single model or theory is enough to explain, predict and generalize on the concept of communication as a tool for individual and social behaviour change. To understand the components of particular information, often times it requires a learning process. Learning cannot be seen physically but can be inferred from behaviour which depends on

experience, practice and performance. Learning theory has been defined by Dashiell as the study of the circumstances which a response and a cue stimulus become connected that is the study of the circumstances under which learning occurs or the study of the process of learning.

Ibara (2015) averred that learning as an active, constructive, cognitive and social process by which the learner strategically managers available cognitive, physical and social resources to create new knowledge by interacting with information in the environment and integrating it with information already stored in the memory. Consequently, we will understand the potential for a relationship between media and learning when we consider it as an interaction between cognitive process and characteristics of the environment.

In accordance to Esgate and Groome (2016), Pavlovs view in conditioning theory is that learning is a shifting of old response to a new stimuli resulting from new situation in which stimuli that produce the desired response are paired with others that do not. After a number of such pairing, the initially ineffective stimuli become connected with the response also in his experiment. He conditioned the dog to salivate when bell is rung, thereby establishing a connection between ringing the bell and making food available. So after sometimes, bell ringing alone made the dog to salivate even without seeing the food. The original response (Salivation) which came after the food was made available, shifts and becomes connected with having the bell tone. The implication for this in learning/teaching is that through ICTs farmers must be provided with specific stimuli to be attracted, interested and attentive. These stimuli (stimulus) must be very strong and repeated many times with long duration as in Pavlovs experiment.

Conceptual Framework

The conceptual framework is the researcher understands of how the particular variables in study connect with each other. This consists of Roles of Mobile Phone Use in Enhancing Agricultural Productivity., Crop Agricultural Productivity which is the dependent variable and the Roles of Mobile Phone Use serving as independent variable; it means that the productivity of the crop farmers depends on the mobile phone use. The moderating variable which is the socio-economic characteristics which means that the socio-economic characteristics has influence on farmer's productivity and then the intervening variable which are the factors that can limit the productivity of the farmers and also means of getting knowledge from extension workers to improve their farm work. Also, the outcome which means that if the effective communication of agricultural knowledge through mobile phone use if properly applied or utilized by the farmers will lead to reduction in production cost of agricultural productivity, improves farming practices, higher productivity or yields, saving of time due to timely procurement of inputs, helps to build up market linkage, leads to greater social cohesion and improves social relationships among farmers and business community and provides new approach to farmers to make decisions much more easier.

Empirical Literature

Abdul Razaque Chhachhar, Changfeng Chen and Jianbin Jin, (2016) studied effect of mobile phone for agriculture, marketing and weather information among farmers in Sindh, Pakistan. The quantitative method was applied and data was collected from 150 farmers from ten districts of Sindh, Pakistan. The total 150 respondents were randomly selected from each district for data collection. The result indicated that more than 97% of the

farmers have their own mobile phones while 23.3% of the respondents use internet on their mobile phone to get different information. Information and communication technologies have improved the life of common men and different sectors of society are getting more benefit from it. Farmers are one of the backward communities in underdeveloped nations and most of the farmers are unaware about technologies in the development of the agriculture. The study showed that farmers did not properly use mobile phone for connected market and call buyers to sell their produce in good price while majority of the farmers did not have contact numbers of agriculture officers as well as meteorological department to get latest information of weather. Moreover, farmers did not discuss agriculture issues and problems with agriculture officers. However, majority of the farmers were significantly agreed to use mobile phone in future for agriculture information.

Victor Chimaobi Okoroji, (2019) examined the factors that influence the adoption of mobile applications. Primary data were collected from a sample of approximately 260 farmers. Data were analysed using descriptive statistics and SEM with the help of IBM SPSS and IBM AMOS software. The study results revealed the current state of mobile application use and the factors that affect the adoption of these applications by farmers. The structural model showed that seven of the direct hypothesised relationships in the research model were supported. Social influence (SI), Perceived usefulness (PU), Information/awareness (IA) and Intention to use (ITU) affected the adoption of mobile applications positively, while perceived risk (PR) and Perceived cost had a negative impact on their adoption. This study contributed extensively to farmers' technology usage literature through its findings. It proved that extended TAM is a suitable model to explain the factors that influence mobile application adoption behaviour. It helped in bridging the information gap between agricultural application developers and farmers by revealing some important demographic information of farmers such as their age, gender, educational level, and the type of farming carried out and most importantly, the factors that affected the adoption and continuing use of mobile applications by farmers.

RESEARCH METHODOLOGY

Study Area

Etche is one of the 23 Local Government Areas of Rivers State and amongst the 13 federal constituencies representing River State in Nigeria's National Assembly and part of the Rivers East Senatorial District. The local government area covers 774.7km² and a population density of 453.4km² according to 2016 Census. It lies within latitude 4°45'N – 5°17'N and longitude 6°55'E – 7°17'E. There are 19 political wards in Etche local government. Etche believe Igbodo to be their ancestral home while the first community to have access to electricity in Etche was Okoroagu.

The people of Etche are mostly engaged in agriculture, earning the nickname 'the food basket of the state'. Etche is one of the host communities of the government owned multi-billion naira palm oil production company Risonpalm, as well as Delta Rubber Production Company. In recent times, real estate development has grown in the area with rapid expansion going on in Igboh-Agwuruasa, Ulakwo-Umuselem and Okehi Clans. Cassava, plantain, banana and yam are important crops. Plantation agriculture (notably Rubber, palm oil, pineapple and plantain) was encouraged by the erstwhile Eastern Nigerian government but this has since lost steam. Agriculture is mostly not mechanized and the use of tractors for farming these crops has dropped slightly in the 1986–2004

period. A rubber processing plant, the Delta Rubber Factory, in Okomoko, has been dormant for more than a decade. Informal activities dominate economic activities alongside agriculture. Mining of the rivers for sand is a new activity. Tourism is not developed and there is a complete absence of tourism infrastructure such as hotels in the two LGAs. Oil and gas are found in many parts of Etche.

Sampling Procedure and Sample Size

Purposive random sampling was used to select 144 registered farmers (ADP) from the study area. The total number of respondents used for this study was one hundred and forty four (144). Two (2) communities were selected from each of the clan, making a total of ten (10 communities).

Table 1: *The Table below Shows the List of Towns and Villages in Etche and the Number of Respondents Selected*

LGA	Number of Communities	Selected Respondents
Ozuzu	Ajah	20
	Ogbaku	20
Igwo	Chokocho	12
	Egwi	12
Umuselem	Ulakwo	20
	Nihe	20
Mba	Obine	10
	Umuoye	10
Okehi	Akwukabi	10
	Igbodo	10
TOTAL	10	144

Method of Data Collection

The instrument used for data collection from was the questionnaire. The data was collected from the respondents through questionnaire and interview. The questionnaire was divided into five (5) sections soliciting information based on the study objectives. Section A was based on the socio-economic characteristics of the respondents, section B ascertain the awareness of mobile phone use for agricultural information study area, section C was on the areas of mobile phone to communicate agricultural information in the study area, section D identified the benefits of mobile phone to communicate agricultural information in the study area, section E obtained information on the constraints associated with the use of mobile phone in the study area.

Method of Data Analysis

The data collected was subjected to descriptive and inferential statistical analysis. The descriptive statistics include frequency count, percentage and mean statistics. Objectives 1 and 2 were analyzed using percentage, and objective 3, 4 and 5 will be analyzed using mean statistics. Any value equal to or above 2.50 means that mobile phone is useful to the farmers but any value below 2.50 means that mobile phone is not useful to the farmers.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Respondents

In this chapter, socio-economic characteristics of the respondents are presented in a tabular form.

Socio-Economic Characteristics

Ages of the respondents examined and presented in Table 2, showed that majority(13.9%) respondents were below 20 years of age; 41.7% indicated that they were between 21- 30 years; 19.4% indicated that they were between 31 - 40 years; 25.0% indicated that they were between 51 - 60 years, and the main age of the respondents was 31.68. This study is in consonance with the findings of Salaaau, Bello and Alanji (2013) and that of Ekerete and Ekanem (2015); that over 60% of the respondents fall within the age of 21-40 years. The implication of the findings is that majority of the respondents belong to the class of active population and so can afford and take decisions on the utilization of mobile phone use in the area. It is also equally presumed that the respondents have the ideal knowledge of the problem under investigation.

Educational Qualification

For educational qualification, Table 2 showed that majority (19.4%) of the respondents indicated that they did not attend any Formal Education but gained farming knowledge and skills through parents, friends or associates; 28.5% indicated that they completed Primary Education; 25.0% indicated that they had Secondary School Education; 27.1% indicated that they had Tertiary Education. The study aligns with the findings of Nenna (2014) that majority 80.0% of cassava farmers were literate while 20.0% had no formal education. It equally collaborates with findings of Oyekanmi and Okeleye (2017) that high percentage of cassava farmers in South West and North West agro-ecological zones are literate. The implication from the educational status of the respondents showed that literate individuals are keen to get information and utilize it effectively. As asserted by Olaniyi, Adetumbi and Adereti (2013) the literate level of the respondents could afford them the opportunity of learning new things and make use of research findings.

Marital Status

As shown on the table 2, 25.7% of the respondents indicated they are single; 47.9% indicated that they are married; 6.3% indicated that they are divorced; 6.3% indicated that they are divorced; 20.1% indicated that they are widow. The implication from the marital status revealed that greater proportion of the respondents (married and widow/widowed) manage their homes and so have reasonable family labour that could help in farming activities.

Occupation

Table 2, indicates that most (27.1%) of the respondents were farmers; 22.9% indicated they are traders; 22.2% indicated that they are civil servants; 27.1% indicated that they are self-employed; 0.7% indicated to be a student. The implication from the occupation data revealed that most of the respondents have primary occupation in addition to farming. There is possible of affording and utilizing mobile phone in the study area.

Household size

Majority (40.3%) of the respondents had household size of 1-5 persons, some(17.4%) had 6-10 persons, 27.1% had more than 11-15 persons and 15.3% had 16 and above persons. Greater proportion of respondents indicated a high number of household sizes. This finding is in line with Nenna (2014). The implication of this findings shows that the respondents had reasonable family labour that could help in farming activities. As asserted by Ani (2004), household size in traditional agriculture determines the availability of labour and level of production. The household size can also affect the possibility of acquiring mobile phone.

Farming Experience

For farming experience of the respondents, 22.2% indicated that they had farming experience within the range of 1-10 years; majority (36.8%) of the respondents had 11-20 years; 30.6% indicated 21-30 years and 10.4% had 31 years and above. This is an indication that the respondents had acquired a wide range of farming experience. This finding is in consonance with the study of Ezeh (2013) which found that the higher the farming experience, the more farmers would have gained more knowledge and technological ideas on how to tackle farm production problems and the higher the output and income.

Income

The result in the Table 2, revealed (9.7%) indicated that their monthly income fell within 1000-10000; 29.2% earned 11000-20000; majority (41.7%) of the respondents earns 21000-30000 and 19.4% indicated 31000 and above. This conforms to the findings of Ekerete and Ekanem (2015) that most of the agro processors had monthly income of 21,000 – 30,000 naira per month. It therefore shows that agro processing is a worthwhile enterprise for rural dwellers.

Table 2: Summary of Response on Socio-economic Characteristics of the Respondents

Variables	Freque ncy	(%)	Mean (x)
Age range			
Below	20	13.89	32
20 – 30	60	41.67	
31 – 40	28	19.44	
41 – 50	36	25.00	
Total	144	100	
Educational Qualification			
Non formal	28	19.44	27.09
Primary School	41	28.47	
Secondary school	36	25.00	
Tertiary education	39	27.09	
Total	144	100	

Marital Status

Single	37	25.69
Married	69	47.92
Divorced	9	6.25
Widow/Widower	29	20.14

Total 144 100

Household size

1 – 5 person	58	40.27	9
6 – 10 persons	25	17.36	
11 – 15 persons	39	27.08	
16 persons and above	22	15.29	

Total 144 100

Total Farming Experience

1 – 10 years	32	22.22	18
11 – 20 years	53	36.81	
21 – 30 years	44	30.56	
31 years and above	15	10.41	

Total 86 100

Monthly

Income (₦)

1,000 – 10,000	14	9.72	2,170
11,000 – 20,000	42	29.17	
21,000 – 30,000	60	41.67	
31,000 and above	28	19.44	

Total 144 100

Awareness of Mobile Phone Use for Agricultural Information in Etche LGA.

The level of farmer's awareness towards mobile phone use is presented in Table 3 below. The respondents agreed to the following awareness; Mobile phone is used to source for improved farming practices ($\bar{x}=3.06$), Mobile phone helps to build up market linkage($\bar{x}=2.08$), Mobile phone helps to get agricultural information that will increase productivity or yield($\bar{x}=2.83$); Mobile phone saves time due to timely procurement of inputs($\bar{x}=2.83$) and improves social relationship among farmers and business community(2.37).

Table 3: Level of Awareness on Mobile Phone Use to communicate agricultural information (n=144)

Level of Mobile Phone Awareness	High Aware	Aware	Low Aware	Not Aware	(x)
Mobile phone is used to source for improved farming practices	58	45	33	8	3.06
Mobile phone helps to build up market linkage	15	20	51	58	2.08
Mobile phone helps to get agricultural information that will increase productivity or yield	40	61	22	21	2.83
Mobile phone saves time due to timely procurement of inputs	39	51	39	15	2.83
Improves social relationship among farmers and business community	23	47	32	42	2.37

Mean Score ≥ 2.50 = Aware; ≤ 2.50 = Not Aware

Source: Field Survey, 2021

Benefits of Mobile Phone Use in Communicating Agricultural Information in the Study Area

The benefits derived from mobile phone use are presented in Table 4 below. Foremost among this benefits are; helps in quick selling of farms produce ($\bar{x}=2.91$), helps to contact extension agents ($\bar{x}=2.83$), saving of time due to timely procurement of inputs($\bar{x}=2.94$), improves social relationships among farmers and business community($\bar{x}=2.39$) and Helps to get information on Improved farming practices ($x=2.83$).

Table 4: Response on the Benefits of Mobile Phone Use in Etche Local Government Area

Note: SA = Strongly Agreed, A = Agreed, D = Disagreed, SA = Strongly Disagreed, (x) = Mean

Benefits of Mobile Phone Use	SA	A	D	SA	(x)
Helps in quick selling of farms produce	57	33	46	4	2.94
Helps to contact extension agents	35	49	7	53	2.83
Reduction in production cost of agricultural productivity.	28	34	49	33	2.39
Saving of time due to timely	63	24	38	19	2.91

procurement of inputs					
Provides new approach to farmers to make decisions much more easier	29	38	31	36	2.35
Improves social relationships among farmers and business community	57	46	30	7	2.94
Helps to get information on Improved farming practices	50	38	10	46	2.83
Helps to get information on higher productivity or yields	67	24	38	15	2.91

Source: Field Survey, 2021

Constraints to Role of Mobile Phone use in the Etche Local Government Area

The constraints associated to the role of mobile phone use are presented in Table 5 below. The major constraints include: inadequate or poor infrastructure ($\bar{x} = 2.65$), poor electricity supply ($\bar{x} = 2.81$), poor network signals ($\bar{x} = 2.69$), No strong internet coverage in the area ($\bar{x} = 2.79$), high cost of mobile phone and running ($\bar{x} = 2.84$) and lack of knowledge on the importance of agricultural information ($\bar{x} = 2.81$). Other studies by Bolarinwa and Oyeyinka (2011; Singh, 2012) had similar conclusions that unaffordable cost is largely blamed and that governments and mobile companies are to be held responsible for the cost and service failure. Furthermore, cost is recognized as having one of the most significant negative impacts on behavioural intention to use (Chong *et al.*, 2011; Luarn and Lin, 2005; Wei *et al.*, 2009; Yu, 2012).

Table 5: Responses on the Constraints to Role of Mobile Phone Use in the Study Area. (n=144)

Constraints	SA	A	D	SD	(x)
Inadequate or poor Infrastructure	39	41	39	25	2.65
Low digital literacy	7	10	61	66	1.71
Poor network signal	38	39	52	15	2.69
High cost of mobile phone and running	47	46	31	19	2.84
Lack of availability of timely and accurate information	10	13	72	49	1.89
Lack of mobile friendly and locally relevant digital content in local languages	52	21	60	11	1.78
Lack of knowledge on the importance of agricultural information	46	42	38	18	2.81
Lack of servicing centres	12	5	53	69	1.65

Source: Field Survey, 2021

Correlation between the Socio-Economic Characteristics of the Respondents and Role of Mobile Phone Use in the Study Area

Table 6 below, shows the relationship between socioeconomic characteristics of the farmers and role of mobile phone in the study area. From the analysis, it is evident that socioeconomic characteristics of the respondents significantly influence the roles of mobile phone use in the study area in terms of age, education and household size. From the hypotheses, the result of Pearson Correlation analysis establishing relationship between the socio-economic characteristics of the respondents and the role of mobile phone use to farmers as presented in table 4.6.1. The result reveals the following age ($r=0.041$; $p<0.05$), the educational qualification ($r=0.01$; $p<0.05$), marital status ($r=0.602$; $p<0.05$), occupation ($r=0.045$; $p<0.05$) and household size ($r=0.18$; $p<0.05$). Apart from marital status that exhibited positive and insignificant relationship. The implication of this result showed that all selected socio-economic variables considered except marital status had a significant on the role of mobile phone use to farmers in the study area. The relationship between the age of the respondents and the role of mobile phone portrayed that as the farmers advance in age, the role of mobile phone use increases. The relationship between the educational qualification and the role of mobile phone use indicates that the higher the qualification of the respondents the more knowledgeable on the mobile phone applications and the more useful of the mobile phone to them. This study collaborate the findings of Nenna (2014) and Aldosari, Al-Shunaifi, Ullah, Muddassir and Noor (2017) that the higher the years of education, the more knowledgeable the farmers will be in the technicalities involved in the use of mobile phone use. The relationship between the marital status and the role of mobile phone use indicates that there is an insignificant relationship. The implication of these findings showed that whether married or not, such status has no significant on the farmers use of mobile phone. The relationship between occupation of the respondents and the role of mobile phone use showed significant relationship. From this finding, it means that the occupation of the respondents has great impact on the role of mobile phone use to the farmers in the study area. The relationship between the household size of the respondents and roles of mobile phone use to farmers indicate a significant relationship.

Table 6: Showing the Correlation relationship between socio-economic characteristics and roles of mobile phone use in the study area

	Role p	Age	Ed u	Marit al	Hhol d	Fex p	Inco me
Pearson Correlati on	1	.894	.99		.887	.72	.199
Sig. (2- tailed)	6	.041	0	.398	.018	6	.047
N	.894	1	4	.602	4	.03	4
Pearson Correlati on	.041	5	.16	.767	.249	.47	.702
Sig. (2- tailed)	990	.837	3	.233	4	9	4
N	.010	163	4	.318	4	.52	.540
Pearson Correlati on	.398	.767	1	.682	4	1	.283
Sig. (2- tailed)	.602	.233	4	1	263	92	.717
N	4	4	4	4	.737	.80	4

tailed)			.31	4	4	8	
N	.887	.654	8			4	-.378
Pearson	.018	.249	.68	-.032	1		.622
Correlati	4	4	2	.737		.39	4
on			4	4	4	7	
Sig. (2-	.726	.479				.60	.567
tailed)	.031	.521	-	.397	.053	3	.433
N	4	4	.46	.603	.947	4.	4
Pearson			3	4	4.		
Correlati	.199	.298	.03			.05	1
on	.047	.702	1	-.283	-.378	3	
Sig. (2-	4	4	4	.717	.622	.94	4
tailed)				4	4	7	
N			.19			4	
Pearson			2				
Correlati			.80				
on			8			.56	
Sig. (2-			4			7	
tailed)						4	
N			.54				
Pearson			0			.56	
Correlati			.46			7	
on			0			.43	
Sig. (2-			4			3	
tailed)						4	
N							

* Correlation is significant at the 0.05 level (2-tailed).

CONCLUSION

Nigeria has a larger rural population than the urban and is very agrarian. The agriculture is dominated by smallholder farmers who are positioned to become a key driver of future economic growth and prosperity if the confronting challenges are overcome. The spirit of this study looked into the contribution of mobile phone as an input-of-change for the country to achieve its agriculture and development potentials. This study investigated the extent to which farmers have taken advantage of mobile phone technology and the benefits they have derived from it. In view of these objectives, the study sought and provided answers to the questions raised in the objectives. Mobile phone created many benefits for the smallholder farmers aside from its unique characteristics of being handy, customized content delivery and convenience. As mobile phone providers continue to penetrate their services into the rural communities where farming is predominant, the tendency is that there will be expansion in the adoption of mobile phone and increased use of the product to cover more aspects of agricultural activities. The impact of geographic isolation, high transport costs, time lost to poor road networks and conditions, and the failure to deliver inputs on-time to farmers, or from the farmers to the market when prices are more favourable, can significantly impact revenue, profitability, and the overall social economic wellbeing of the rural communities.

Considering all these issues, the use of the mobile phone technology has reasonably reduced most of these problems. It has assisted farmers to gain easy and timely access to market and market information. However, the low use of mobile phones for obtaining weather information is worrying. Weather information is an important detail upon which modern agriculture relies. Apart from providing normal agricultural weather information, it is relied upon to provide sudden extreme weather forecast that can be devastating. This

study did not investigate the reason for the low mobile phone use to obtain this service; however, smallholder farmers generally are conservative and would often rely on tradition and local intuition to predict weather patterns. Moving forward, a review of the use of weather predicted data is first necessary to ascertain the availability of the data to farmers, secondly whether the farmers can access the data, and finally whether the data can be made available through mobile phone applications.

RECOMMENDATIONS

Based on the above Conclusions, the Recommendations for the study include:

- i. Owing to the fact that socio-economic characteristics are significantly associated with the use of mobile phones in communicating agricultural information, mobile phone service providers need to reflect on these characteristics when developing mobile phone applications and content which would be held by users valuable.
- ii. Researchers need to make a thoughtful review of their clients so that specifically they serve particular groups of clients based on their real agricultural information needs. This will serve as a solution to the fact that different groups of farmers vary in their requirements at different peaks of production periods.
- iii. Local government authorities should increase efforts to improve rural infrastructures, especially those meant for reliable electric power supply, to enhance mobile phone use.
- iv. Local government authorities should regularly organize meetings with various stakeholders for exchange of ideas meant to increase mobile phone use in communicating agricultural information.

REFERENCES

- Abdul Razaque Chhachhar, Changfeng Chen^{*} and Jianbin Jin, (2016). Mobile Phone Impact on Agriculture and Price Information among Farmers. Indian Journal of Science and Technology, Vol. 9(39), DOI: 10.17485/ijst/2016/v9i39/98432, October 2016.
- Aker, J. C. (2011). Mobile phones and economic development in Africa. The Journal of Economic Perspectives, 24(3), 207–232. doi:10.1257/jep.24.3.207.
- Ani, K. (2004). Discourse on ICT and development. Information Technologies & International Development, 6, 1–18.
- Ashraf, J. J., Okello, R. M., & Adera-Ofwona, E. (2018). Awareness and use of mobile phones by smallholder farmers in Kenya. In B. Maumbe (Ed.), E-Agriculture and E-Government for Global Policy Development: Implications and Future Directions. Hershey, PA: IGI Global.
- Kumar, M. & Karthikeyan, P. (2019). An economic assessment of banana genetic improvement and innovation in the Lake Victoria region of Uganda and Tanzania. Research Report 155. Washington, DC: International Food Policy Research Institute.
- Ekerete, B. I. & Ekanem, J. T. (2015). Assessment of Information and Communication Technology Utilization by Agro-processors in Ikono Local Government Area of

Akwa-Ibom State Nigeria. Asian Journal of Agriculture Extension, Economic & Summary of the E-Consultation April.

- Esgate, A. & Groome, D. (2016). An Introduction to Applied Cognitive Psychology. Philadelphia, U.S.A: Taylor and Francis Group Psychology Press.
- Ezeh, G. (2013). Information Communication Technology and Agricultural productivity: Evidence from Cross-Country Data. Retrieved from www.onlinelibrary.wiley.com
- Ibara, E.C. (2015). Effective Implementation of Knowledge and Learning Management in Nigeria Universities: The Administrator's Concern. African Journal of Educational Research and Development (AJERD), 6(1) 44-49.
- Nenna, M.G. (2014) Women Participation in fisheries activities in Anambra. Retrieved from www.krepublishers.com 10th December, 2018.
- Nenna, M.G. (2014). Factors affecting application of inorganic Farming practices by small-scale farmers. Retrieved from www.krepublishers.com 10th December, 2018.
- Oyekanmi, G. & Okeleye, P. (2017). Mobile Applications in Agriculture. Retrieved from http://www.syngentafoundation.org/__temp/Report_on_mAgriculture_abridged_web_version.pdf
- Victor, C., O. (2019). Farmers' use of mobile phone applications. Thesis submitted in partial fulfilment of the requirements for the Degree of Master of Commerce (Agricultural).