

# Analysis of Ownership and Utilization of Mobile Phones among Farmers and Extension Workers in Jada Local Government Area of Adamawa State, Nigeria

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## ABSTRACT

The study analyzed the ownership and utilization of mobile phones among farmers and extension workers in Jada Local Government Area of Adamawa State, Nigeria. Simple random sampling technique was employed in the sampling of the districts, villages and respondents. A total of five (5) districts, twenty five villages (25), seventy five (75) farmers and fifteen (15) extension workers were sampled for the study. The specific objectives were to: identify the socio-economic characteristics of the respondents; ascertain the ownership and utilization of mobile phones by the respondents; determine the socio-economic characteristics influencing ownership and utilization of mobile phones by the respondents. The primary data generated from the survey were subjected under analysis. The first three objectives were addressed using percentages and frequencies, while the Logit regression was used to address objective four. Major findings of the study indicated that majority (76%) of the farmers was males, while 24% were females. Similarly, the majority (80%) of the extension workers was males and 20% were females. Almost 95% of the farmers have an educational qualification of at least the secondary school level certificates. However, 73.3% and 26.7% of the extension workers have college certificates and degrees, respectively. Only 64% and about 73% of the farmers and extension workers, respectively have mobile phones. Of these, 88% and 60% utilize their mobile phones for agricultural communication. Age ( $X_1$ ), income ( $X_3$ ) and level of education ( $X_5$ ) were found to have positive and significant relationships at 5% level of significance with ownership of mobile phones. Income ( $X_3$ ) and level of education ( $X_5$ ) of the respondents have positive and significant relationships at 5 and 1% level of significance, respectively with utilization of mobile phones. Poverty and the relatively high cost of mobile phones were the major constraints identified, while poor network service and inability to type and send text messages were the major problems identified on utilization.

**Key words:** Ownership, Utilization, Mobile Phones, Farmers, Extension Workers.

## INTRODUCTION

The Agricultural Extension Service is concerned, among others, with the function of providing farmers with relevant agricultural information, ideas and technologies with a view to improving their productivity and standard of living. This can be easily facilitated through the use of information and communication technology tools. Information and Communication Technology (ICT) was defined by Heeks (1999) as electronic devices for capturing, storing, processing and communicating information. Similarly,

Food and Agriculture Organization (FAO, 1993) stated that ICT is involved in collecting, processing, storing, retrieving, disseminating and implementing data and information, using microelectronic optics and telecommunications. According to Technical Centre for Agricultural and Rural Cooperation (CTA, 2003), ICTs are technologies which facilitate communication and, thus, the processing and transmission of information electronically. In the light of these definitions, the ICT tools that have great potentials

for application in agricultural extension communication for rural development include, radio, television, mobile phones, short message services, world wide web (www), search engine cameras, video, e-mail and computers. Others are the compact disc (CD), digital video drive (DVD), web publishing and printed materials. For instance, the mobile phone provides existing new ways through which extension workers can reach farmers in rural areas that were, in the past, very difficult to contact, particularly in developing countries like Nigeria.

The ownership and use of mobile phones among rural farmers has continued to increase, thereby increasing the chances of extension workers passing agricultural information to farmers in their communities through mobile phones. Mobile phones are fast becoming the one of the new information and communication tools for agricultural extension services. Globally, traditional agricultural extension systems are in decline, and, while the number of farmers is increasing, the number of extension workers is decreasing (Gakuru et al., 2009; Anderson and Fedder, 2007; Aker, 2008), making it absolutely difficult for extension workers to be efficient. In the past, the major means of information dissemination in developing countries to farmers has been through magazines, newspapers, posters, bulletins, radio and television. The Asian Development Bank (2003) explained that ICTs have become powerful tools in providing unprecedented opportunities to meet vital development goals far more effectively than before. They are therefore, used to achieve information transfer more effectively than other communication methods. In view of the foregone, it is apparent that ICTs can give a new impetus to the social organization and productive activities of agriculture, which, if nurtured effectively, could become sure and useful transformational factors in Jada Local Government Area of Adamawa State. Agricultural extension, in the current scenario of a rapidly changing world, has been recognized as an essential mechanism for information and advice as inputs for modern farming (Jones, 1997). It was therefore, against this backdrop that this study was conducted to analyze the ownership and utilization of mobile phones by agricultural extension workers and farmers in Jada Local Government Area.

### **STATEMENT OF THE PROBLEM**

The use of modern ICTs in agricultural extension service delivery has enhanced the efficiency of research extension farmer linkage system much greatly. However, Yaghoubi-Faram et al. (2011) has noted that the use of ICTs must first be well adopted for the livelihood of rural communities to be improved meaningfully. In spite of the international spread of ICTs, the availability, importance, use and impacts have been geographically uneven. In developing countries, there are various problems which create barriers to people's ownership and utilization of mobile

phones.

Governments in many developing countries, including Nigeria, have reduced their direct involvement in the provision of agricultural extension services. This creates even greater challenges for the agricultural extension services to remain relevant in terms of effectiveness, efficiency and the time it takes to reach target audience and the area that can be covered in a given period. This implies that if these challenges are to be overcome and for the extension service to be relevant, the ownership and constant utilization of mobile phones in extension service delivery is an essential and timely mitigation option. In other words, for contemporary agricultural extension to provide viable educational programs, information and opportunities to reach expanded end users, the use of ICTs is inevitable. This situation points the need for alternative sources of information rather than face-to-face contact method which is being currently relied upon by Nigerian extension workers and farmers. In order to attain the advantages of the use of mobile phones in promotion of agriculture, both farmers and agricultural extension workers must both own and utilize same. This study was therefore, carried out to analyze the ownership and utilization of mobile phones by extension workers and farmers in the area of study where this study had never been conducted. Thus, the study was designed to obtain address the objectives stated.

### **OBJECTIVES OF THE STUDY**

The main objective of the study was to analyze the ownership and utilization of mobile phones among farmers and extension workers in Jada Local Government Area. The specific objectives were to:

- i. Identify the socio-economic characteristics of the respondents;
- ii. Ascertain the ownership and utilization of mobile phones by the respondents;
- iii. Determine the socio-economic characteristics influencing ownership and utilization of mobile phones by the respondents;
- iv. Examine the constraints in ownership and utilization of mobile phones in the study area.

### **SIGNIFICANCE OF THE STUDY**

The findings of this study will provide valuable information about the ownership and utilization of mobile phones by farmers and extension workers in the study area. The findings will also be very important to agricultural and non-governmental organizations (NGOs) who are interested in agricultural and rural development programmes. Results of the study will equally give some direction to the Nigerian government in formulating or reviewing some agricultural policies that will significantly improve the ownership and

utilization of mobile phones in the study area. Researchers who are also interested in similar studies can find the findings of the study important for designing studies that will cover a much wider area in the country.

## SCOPE OF THE STUDY

The study concentrated only on ownership and utilization of mobile phones among farmers and extension workers that are living in Jada Local Government Area of Adamawa State, Nigeria.

## METHODOLOGY

### The Study Area

The study was conducted in Jada Local Government Area of Adamawa State. The Local Government Area covers a total land area of about 107.5 km<sup>2</sup>. It shares boundaries with Fufore Local Government Area to the North and Mayo-Belwa Local Government Area to the West. It is also bordered with Ganye Local Government Area to the South and to its South East is the Cameroon Republic. It is divided into nine (9) administrative Districts, which are Jada, Mbulo, Danaba, Mayo-Kalaye, Nyibango, Yelli, Leko, Mapeo and Koma Districts. The climate of the area is typically the tropical sub-humid type. It has a mean annual temperature range of 27°C to 30°C and a total rainfall of 175 cm annually (Adamawa State Government Diary, 2016). Jada Local Government Area has the population of 168, 445. The major occupation of the people is farming, and the major crops grown are guinea corn, maize, rice, groundnut, Bambara nut and cowpea. Others are yam, cassava and sweet potatoes.

### Sources Data and Methods of Data Collection

Data were collected from both primary and secondary sources. The primary data were obtained through the use of a well-structured survey questionnaire, which was used to obtain information from the respondents by means of interview schedule. Secondary information was obtained from textbooks, journals and the Internet.

### Sampling Techniques and Sample Size

Multistage simple random sampling method was employed in selecting the respondents. In the first stage, five (5) districts were randomly selected from the nine (9) existing districts. In the second stage, five (5) villages were also randomly selected from each of the selected districts. From each of the selected villages, 3 farmers were randomly selected from the list of registered farmers in each of the villages, giving a total of 75 respondents from among the farmers. On the other hand, all the 15 agricultural extension workers positioned by the Adamawa

Agricultural Development Programme in the selected districts were the respondents. Thus, a total of 75 farmers and 15 extension workers who constituted a total of 90 respondents were involved in the study.

## Methods of Data Analysis

The descriptive statistics in the form of frequencies and percentages were employed to analyze objectives i, ii and iv. The Logit Regression was used to address objective iii. The explicit model of the Logit regression is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \dots + \beta_n X_n + U$$

Where: Y = Ownership (if the respondents has a mobile phone = 1; if not = 0), Y = Utilization (if the respondent utilizes the mobile phone = 1; if not = 0), X<sub>1</sub> = Age (number of years of the respondent).

X<sub>2</sub> = Sex (if male = 1; if female = 0), X<sub>3</sub> = Income (amount in naira value), X<sub>4</sub> = Marital status (if married = 1; any other = 0), X<sub>5</sub> = Level of education (number of years the respondent spent in school),  $\beta_0$  = Constant term,  $\beta_1 - \beta_n$  = Regression Coefficients and U = Error terms.

## RESULTS AND DISCUSSION

### Socio-economic Characteristics of Farmers and Extension Workers

The results in Table 1 also show that 76% of the respondents are males, while 24% are females. This shows that fewer women than their male counterparts were involved in the study. This could be attributed to African culture and traditions where women are usually not allowed to participate in most activities which men usually dominate. This probability is supported by the report of Sahuboro and Wunsch (2003), who also reported that the geographical context in most African countries is such that women are not yet as fully emancipated as their western counterparts and are expected to stay at home. The results in the table also show that 80% of extension workers are men, while only 20% are females. This means that men have also formed the majority of the agricultural extension workers in the area of study. This fact is supported by the finding of Adedoyi et al. (1999), where they reported that men dominated the agricultural workforce in Nigeria. The results in Table 1 show that 38% of the respondents among the farmers were within the age range of 25 to 35 years. This constitutes the highest percentage when compared to all other age categories. It is expected that the respondents within the age class can probably own mobile phones because they are within the age limits that are strong and up and doing. It is also expected that they are young enough people to desire mobile phones taking into consideration the generation in which we are.

This assertion could be true when the result of a study

**Table 1.** Distribution of the respondents based on their socio-economic characteristics.

<b>Socio-economic Variable</b>	<b>Frequency (f)</b>	<b>Percentage (%)</b>
Sex (Farmers)		
Male	57	76.0
Female	18	24.0
Total	75	100
Sex (Extension Workers)		
Male	12	80.0
Female	03	20.0
Total	15	100
Age (Farmers)		
18-24	13	17.0
25-34	28	38.0
35-44	15	20.0
45 and above	19	25.0
Total	75	100
Age (Extension Workers)		
25-34	03	20.0
35-44	05	33.3
45 and above	07	46.7
Total	15	100
Income (Farmers)		
20, 000.00 – 100, 000.00	35	46.7
101, 000.00 – 200, 000.00	28	37.3
201, 000.00 and above	12	16.0
Total	75	100
Income (Extension Workers)		
20, 000.00 – 100, 000.00	-	-
101, 000.00 – 200, 000.00	02	13.0
201, 000.00 and above	13	86.7
Total	15	100
Level of Education (Farmers)		
Non-Formal	01	1.3
Primary School	03	4.0
Secondary School	19	25.4
College	43	57.3
University	09	12.0
Total	75	100
Level of Education (Extension Workers)		
College	11	73.3
University	04	26.7
Total	15	100

Source: Field Survey, 2017.

conducted by Gutierrez and Gamboa (2010) is considered. In their findings, they indicated that active participants in farming who have mobile phones are within the age range of 26 to 33 years old. Therefore, these respondents are expected to both own and utilize mobile phones. If this assertion is correct, then communication between them and extension workers will be facilitated. This is especially true because the highest percentages 33.3% and 46.7% are still within the active age range of 35 to 44 years and 45 years and above. Their higher ages of the extension workers could be justified based on the fact that they are government workers who had undergone several stages of educational trainings for them to be employed. The results in Table 1 also show that 57 and 26% of the

respondents among the farmers had obtained post-secondary and secondary school educational levels, respectively. About 12% are degree holders, 4% have primary school education and 1% is of the non-formal education. This indicates that majority (95%) of the farmers had attained a minimum of secondary school education. On the other hand, the results for extension workers show that 100% of them have a minimum qualification of a diploma. This implies that they are literates and can appreciate the use of mobile phones as indicated by Sabuhoro and Wunsch (2003). This shows that majority of both farmers and extension workers can operate and use the mobile phone, if at all they are able to own it. It is therefore, a great potential for receiving and

**Table 2.** Distribution of respondents based on ownership and utilization of mobile phones.

Ownership of Mobile Phones	Frequency (f)	Percentage (%)
Farmers		
Yes	48	64.0
No	27	36.0
Total	75	100
Extension Workers		
Yes	11	73.3
No	04	26.7
Total	15	100
Utilization of mobile phones		
Farmers		
Yes	42	88.0
No	06	12.0
Total	48	100
Extension workers		
Yes	07	60.0
No	04	40.0
Total	11	100

Source: Filed Survey, 2017.

passing agricultural information between them and the extension workers. This is especially true considering the report of study carried out by Sabuhoro and Wunsch (2008) in which they indicated that the use of mobile phone is believed to be positively associated with level of education.

### Results on Ownership and Utilization of Mobile Phones

Table 2 depicts the distribution of farmers and extension workers based on ownership and utilization of mobile phones. The results show that 64% of the respondents among the farmers own some mobile phones, while 36% of them do not. One of the most probable reasons for the large number of the farmer respondents possessing mobile phones could be to utilize them for receiving or passing agricultural information since agriculture has now been understood by a large number of rural people as a business. One of the possible reasons why so many of the respondents do not have mobile phones may not be unconnected with the fact that such farmers do not get enough annual income that could feed their families, provide them with other basic needs and at the same time afford other extra needs such as the need for mobile phones. The results on ownership also show that 73.3% of the extension workers shows have phones, while 26.7% do not. The higher percentage of the extension workers who have mobile phones may be attributed to the fact that they are salaried workers and are also relatively more educated. Therefore, considering the many uses of mobile phones, most of them might have considered getting mobile phones a necessity rather than a luxury.

Table 2 also depicts the distribution of farmers and extension workers based on utilization of mobile phones.

The results indicate that 42 (88%) of the respondents among the farmers who possess mobile phones utilize them frequently for sending or receiving agricultural information between them and extension workers or input sellers, produce buyers or other business matters, while 6 (12%) do not. The reason for this higher percentage of them is involved in such utilization may be attributed to the fact that the farmers or rural people are the ones that seek for agricultural information more than their extension workers as a counterpart. The findings also show that 7 (60%) of the extension workers who have mobile phones constantly utilize them for receiving or sending agricultural information between them and their clientele. Only 4 (40%) of them do not engage their mobile phones in discussing any agricultural extension matters.

### Results of Logit Regression Analysis on Ownership of Mobile Phones

Age ( $X_1$ ), income ( $X_3$ ) and level of education ( $X_5$ ) were found to be positive and significant with the ownership of mobile phones as shown in Table 3. The results reveal that age and level of education both have a positive and significant relationship with ownership of mobile phones at 5% ( $P < 0.05\%$ ) level of significance. The implication of this is that when the age and level of education of an individual increases, the tendency for them to own a mobile phone also increases. It means that a very young individual may not be able to obtain the money required to buy a mobile at such a very young age. This agrees with the findings of Sabuhoro and Wunsch (2003) and Gutierrez and Gamboa (2010) who reported, respectively that higher education and active age range increases the use of mobile phones among farming families. However, as the same individual grows older he/she can work to obtain money and hence,

**Table 3.** Result of logit regression analysis on ownership of mobile phones.

Variables	Coefficients	Standard Error	t
X <sub>1</sub>	0.022	0.397	0.045**
X <sub>2</sub>	0.229	0.706	0.746
X <sub>3</sub>	0.000	0.000	0.031**
X <sub>4</sub>	2.409	0.865	0.757
X <sub>5</sub>	0.142	0.460	0.009***
Constant	3.043	2.055	1.39

\*\*\* = Significant at 1% \*\* =Significant at 5%.

**Table 4. Results of** logit regression analysis on utilization.

Variables	Coefficients	Standard error	t
Utilization			
X <sub>1</sub>	0.125	0.274	0.029***
X <sub>2</sub>	0.618	0.480	0.198
X <sub>3</sub>	0.000	0.000	0.001**
X <sub>4</sub>	0.195	0.421	0.643
X <sub>5</sub>	0.393	0.272	0.049**
Constant	1.818	1.347	0.177

\*\*\* = Significant at 1% \*\* =Significant at 5%.

**Table 5.** Distribution of the respondents based on constraints for ownership and utilization.

Constraints	Frequency	Percentage (%)
Ownership		
Lack of electricity	13	14.4
Poverty	42	46.7
High cost of mobile phones	35	38.9
Total	90	100
Utilization		
Poor network service	50	55.6
Inability to type and send text messages	22	24.4
Unstable source of electricity	18	20.0
Total	90	100

Source: Field Survey, 2017.

be able to buy a mobile phone. Similarly, as the education of an individual increases, the likelihood of him possessing a mobile phone also increases. This is because educated farmer or extension worker have the knowledge and, hence, they have a higher tendency to desire to possess mobile phones for communication and various other functions. Income was also found to be positive and significant at 1% ( $P < 0.01\%$ ). This implies that as the income of the respondent increases, his probability of possessing a mobile phone also increases.

The results on Table 4 show that income ( $X_3$ ) and the level of education ( $X_5$ ) of the respondents have positive and significant relationships with the utilization of mobile phones at 5% ( $P < 0.05$ ) and 1% ( $P < 0.01$ ) level of significance, respectively. This implies that as the levels of education and income increase, there is also an accompanying increase in the utilization of mobile phones

by the respondent. This could be attributed to the fact that the educated farmers and extension workers can perform many functions because of their literate status. Similarly, for any unit increase in the income of the respondent, there is greater utilization of the mobile phones by them. Using mobile phones will not only improve information and knowledge management for extension workers and farmers but will also increase the agricultural production and productivity of the farmers since they can access important production information easier and faster as well as from reliable sources in good time.

#### Constraints in Ownership and Utilization of Mobile Phones

Table 5 presents the constraints affecting the ownership of mobile phones among farmers and extension workers.

The table shows that 38.8% of the respondents reported the high cost of mobile phones is the reason why they are either not able to own it or to hire it. However, 15.6% indicated the lack of electricity whereas 45.6% blamed their lack of ownership on general poverty. This finding is supported by the results of the findings of Galloway and Machrine (2005), who reported that the main obstacle affecting ICT diffusion is the price that is charged to end-users by ICT service providers. The table also presents problems encountered when using mobile phones. More than half (55.6%) of the respondents reported poor network service as the major constraint they do encounter in the utilization of mobile phones in the study area, 22.4% are being confronted by the problems of their inability to type and send text messages and the remaining 20% complained about unstable source of electricity which affects the charging of the batteries of their mobile phones. The finding is in consonance with that of Bolarinwa (2011) and Falola and Adewumi (2011), who indicated in both studies which were conducted in different areas that fluctuating network service, among others, was the major constraint to the use of cell phones in Nigeria.

## CONCLUSION

Dissemination of agricultural information between farmers and extension workers, between farmers and farmers and between extension workers and extension workers is very easy in the study area. It is also easy for farmers to communicate with farm input marketers, farm produce buyers and consumers. Thus agricultural production and other activities could be said to be flourishing in the area of this study. This conclusion owes its origin from the fact that findings of the study revealed that majority of the respondents are educated and that the majority of them also own mobile phones. The large numbers of those respondents with a minimum of secondary school level of education and large number of them who possess mobile phones can greatly facilitate and ease information transfer between all the agricultural stakeholders in the study area. This is because very large numbers of farmers and extension workers can be reached in a very short time and also timely as compared to the traditional face-to-face contact method of agricultural extension service delivery. Therefore, the age long problem of large number of farmers under the jurisdiction of a single cell agent is greatly reduced if not totally overcome. However, the erratic nature or total absence of electricity, the total absence or epileptic nature of the network service and high service charges, and the relatively high costs of mobile phones have made issues difficult and discouraged many of the respondents from the desire to own and utilize same.

## RECOMMENDATIONS

Based on the findings of the study, the following

recommendations were considered helpful. (1) The Nigerian Communication Commission should ensure that, in collaboration with the GSM operators in Nigeria, network services are not only extended to the rural areas, but also that the network service signals are very strong enough for proper reception. This is important because many of the rural communities in the study area access merely the spillover of services from urban centres, which is not enough for attractive interaction with their counterparts. (2) Extension workers should encourage the respondents who are not capable of buying mobile phones to form thrift groups and help each other buy them one after the other. The farmers can form cooperative farms or projects so that when the produce of such farms are sold they can use the money realized to buy mobile phones for the cooperative members. (3) Extension workers should encourage more of the rural dwellers to buy mobile phones by emphasizing their importance for agricultural production activities in terms of access to information, speedy and time dissemination of agricultural information and business transaction to mention a few. This will greatly reduce the problems brought about by inadequate and/or misleading information from unknown sources and (4) since education has significant and positive relationship with both ownership and utilization of mobile phones, educational training sessions should be organized periodically for the rural farmers. Such trainings should include teaching them how to read and write and how to operate and utilize mobile phones for various purposes.

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