

USAGE OF MOBILE PHONES IN IMPROVING LIVELIHOODS AMONG HORTICULTURAL FARMERS IN PARTS OF KADUNA NORTHERN GUINEA SAVANNAH ECO-ZONE: EMPIRICAL STUDY OF IGABI LOCAL GOVERNMENT AREA OF KADUNA STATE

ABSTRACT

The study examined the use of mobile phones in improving the livelihoods of rural horticultural crop farmers in Igabi Local Government Area of Kaduna State. Eighty (80) questionnaires were sampled among horticultural crop farmers who own and use mobile phones and seventy-six (76) questionnaires were retrieved. A multistage sampling technique was used in sampling the respondents. The data collected were analyzed using descriptive statistics and regression analysis. The results showed that 46.05% are males and 53.95% are females. 26.32% were between 31-40 years, 55.26% were married and 52.63% had at least secondary education. 52.63% have owned handsets for at least 4-6 years and 56.58% obtained the sets from personal savings. Mobile phone usage improved the livelihood in reducing transport cost which was highlighted by 96.05% of the sampled farmers (96.05%), reduced exploitation/low pricing by middlemen and improved income of producers (84.21%). It also enhanced interaction among rural horticultural crop farmers at different locations (92.11%). Poor network coverage (39.47%), poor power supply (19.74%) and theft/loss of handsets (10.53%) were the major constraints associated with mobile phone usage. The regression analysis showed significant relationship between age, household size, educational status and use of mobile phone at ($P < 0.05$) level of significance. Therefore, it is recommended that the federal government makes law that the GSM service providers minimize network problems and reduce call rates while state and local government improve rural electricity supply to enable rural horticultural crop farmers utilize the full potentials of mobile phones for improved performances.

Key Words: Mobile phone, Horticulture, Farmers, Improving Livelihoods, ~~livelihood~~,

Improving,

1.0 INTRODUCTION

One of the biggest concerns of farmers globally is the need to increase agricultural productivity and production efficiencies. This holds true both for horticultural production producing for the market or purely for self-consumption. The productivity and profitability of smallholder farmers are often limited by a number of factors that are out of their control such as; the increasingly erratic vagaries of the weather; technology, climate; technology; global commodity prices; and policies (1). All of these factors are further compounded by the relative lack of technical and financial services and dearth of information (e.g. about prices, market requirements). (Reference ?????). Information and Communication Technologies (ICTs) are seen as revolutionary agents of change in the field of agriculture, providing a number of tools that can help the smallholder farmer, primarily through improving the quality and quantity of information available to them. (Reference ?????). More specifically, many of the tools and those that perhaps hold the greatest promise are those that utilize mobile technologies. Mobile adoption in the developing world is occurring rapidly: in such a way

Comment [BTHM1]: The sample size is a bit on the low size but not low enough to render the findings insignificant.

Comment [BTHM2]: Cannot start a sentence with a number.

Comment [BTHM3]: See comment above.

Comment [BTHM4]: Policy recommendations must be feasible and practical. Rather than calling for an impossible law the author should recommend that the federal government provides economic incentives, such as tax deductions for imported equipment, for mobile service providers to expand their mobile service coverage in rural/horticultural production areas.

Comment [BTHM5]: Some policy recommendations, e.g. the need to reduce call rates, are disconnected from the study findings since exorbitant call rates are not highlighted as one of the key constraints.

Comment [BTHM6]: I am failing to see the link between this statement and the reference. Maybe this is a point where a number of references are required to capture all the issues discussed.

Comment [BTHM7]: A reference(s) is/are missing here.

Comment [BTHM8]: Same as above.

that the rate of increase is greater than that of the developed world, (2). Conversely, have witnessed the development of mobile phones, or mobile technology, as a major driver of economic growth. In addition, phones have ~~has~~ provided new opportunities to address the challenges faced by horticultural farming. For example, increasing use of mobile phones for information exchange, such as disease surveillance and pest tracking, is now common practice. ~~(Reference ?????)~~. Linking knowledge to innovation is also crucial to addressing the information and knowledge gaps in the ~~agricultural agriculture~~ sector: (3)-. Therefore, mobile phones can also play a very important role in bridging information gaps. FAO has been promoting the use of ICTs in agriculture and has focused on ICT innovation for improving agricultural production and enhancing value chains. Mobile phone technology has rapidly expanded all over the world as well as in developing countries (4).

Comment [BTHM9]: This statement does not read well. Seems as if a word/words is/are missing.

Comment [BTHM10]: Same as above.

Mobile phones, which is an integral part of ICT, has become an information communication of our time and their increased number of growth rates have been attributed to many factors including the liberation of ~~the~~ communication processes. Government of many developing countries and development agencies are focusing on extending ICT information structure into rural areas as they seek to encourage growth, alleviate poverty and become the perceived digital divide (5). ~~These -this~~ plans would also accelerate food production since the majority of ~~what is consumed is imported thus this becomes a strategy for import substitutionthe consume are exported~~. According to (6), mobile phones are ideal ~~development tools that are areas~~ cheap to set up, easy to use and filling a ~~vital need~~. Today in Nigeria, most rural farming communities have access to mobile phone services, which ~~havehas~~ enabled closer contact between them and development. (7,4) have separately shown that in developing countries ~~ICTs information and communication technologies (ICTs)~~ such as mobile phones can impact on rural livelihoods and on poverty in the following areas: increased opportunity to access resources, empowerment through information about choices that affected them, decreased vulnerability to risk due to the possibility to send and receive information (8).

Comment [BTHM11]: Meaning ????

About 75% of horticultural farmers live in rural areas where they are struggling for their basic needs (9). Their living standards ~~areis~~ very low which limited them to the use of ~~ICTs information technology (ICT)~~ in which mobile phone is an integral part; to increase and improved their livelihood and horticultural farming activities in ~~disseminatingtransferring~~ vital information on new ideals of modern method of ~~producingraising~~ various horticultural crops; combating outbreak of pest and diseases; seeds improvement and use of genetically modified seeds which can give them quick returns, fertilizer application and various ways of improving soil fertility. The advent of ICTs to our horticultural farmers (mobile phones) will not only guarantee the poor rural communities ~~an opportunity~~ to create and share ~~vital information knowledge~~ on various horticultural systems that could lift them out of poverty level but in all areas of life that improve their standard of living and sustainability. Mobile phone services should be in use to access horticultural market information and knowledge, increase the agriculture business by improving the productivity, especially for developing countries. Mobile phones which are normally in use to communicate with family and friends could be used for horticulture business stakeholders. ~~Mobile pPhones~~ could be good device to make strong relationship with all horticulture business stakeholders by communication, SMS

Comment [BTHM12]: This assumes that the other part is a blank tabularizer (ignorant) which is non-factual and not necessarily supported by evidence.

Comment [BTHM13]: Knowledge is the totality of what is known and believed and can therefore not be shared, while information (data) is what is shared.

~~and~~ email thus benefiting farmers by providing timely market information to increase the income and reduce levels of ~~decrease the~~ poverty.

Although mobile communication has quickly become an ~~the~~ important part of rural populations, its applications are not always the most appropriate so good for farmers because most of these applications are not related to livelihoods and the environment of rural areas farmers. These mobile phone applications generally do not follow any generic blueprint and design for specific target markets and lack having the localized contents (10). Most ~~of~~ mobile applications are not user-friendly and inconsiderate of we should consider the illiteracy of rural farmers. ~~when developing such mobile application.~~ The information such as on horticultural agronomic practices, marketing, weather, advices should be local based and in local language. There are also educational and social barriers which need to be broken by academic institutions and proper interest of religious, government, NGOs, Mobile phone companies and development participants (11). Infrastructure and cost are also big issues to consider in mobile phone technology. The objective of the study is to examine the perception of rural horticultural crop production on the usage of mobile phones in improving livelihoods among horticultural farmers in parts of Kaduna Northern Guinea Savanna Eco-zone.

1.1 Hypothesis

- H₀: There is no relationship between selected socio-economics characteristics of the rural horticultural farmers and their perception of contribution of mobile phone to improvement of rural livelihoods.
- H₁: There is relationship between selected socio-economics characteristics of the rural horticultural farmers and their perception of contribution of mobile phone to improvement of rural livelihoods.

2.0 MATERIALS AND METHOD

2.1 Study Area

The study was carried out in Igabi Local Government Area (LGA) of Kaduna State. Igabi is located in Northern Guinea Savanna region of Nigeria on latitude 10⁰E 37¹N and 10⁰ 41¹N and longitude 7⁰ 47¹E (12). Igabi Local Government Area shares boundary with Kaduna South, Kaduna North, Giwa Local Government and Zaria Local Government Areas of Kaduna State. It has an annual rainfall of about 1000mm-1500mm per annum. Major crops grown in the area include maize, cassava, millet, sorghum, guinea-corn and, water-melon, etc. The area consists of different tribes and ethnic groups such as Yoruba's, Hausa, Igbos, Fulani's, Gbagyi's, Ebira's living together in peace and harmony but predominant tribal majorities are Gbagyi's and Hausa's. The area has an estimated population of about 570,000 people and covers an area of about 4556.95 square kilometers, with annual rainfall of 1000mm 1500mm (13).

Comment [BTHM14]: Why "etc" when it's a non-exhaustive list of crops?

Comment [BTHM15]: Repeat. See above.

2.2 Method of Data Collection

Primary data and secondary data were used for this study. The primary data was collected through structured questionnaires while secondary data was sourced from past survey data, ~~the Internet~~internet, ~~public report~~magazine and journals. The questionnaires were designed to collect the following types of information;

Comment [BTHM16]: Not a recommended source of academic referencing.

- i. ~~S~~socio-economic characteristics of the respondents in the study area.²
- ii. ~~perception of h~~Horticultural crops farmers's perceptions on how mobile phone have improved in the study area.²
- iii. Data related to ~~Determine~~ the relationship between the selected socio-economic variables and the use of mobile phoned.

2.3 Sampling Techniques

Multistage sampling was used. In selection of respondents Igabi Local Government has a total of 65 districts, out of which four (4) districts were purposively selected because of the prevalence of mobile phone usage by the respondents and access to the three (3) main mobile service providers namely; MTN, Glo and Airtel. Through random sampling, four (4) communities each were selected from the districts while five (5) respondents were picked from each community to give a total of eighty (80) respondents. The questionnaire was designed in English language and administered by group of interviewers who can speak and write in local dialects. Face-to-face method of interviews was adopted (14).

Comment [BTHM17]: Using which sampling technique?

Comment [BTHM18]: Sample size rather small. See comment # 1 above.

2.4 Analytical Tools

The following tools of analysis were used to achieve the stated objective.

- i. Descriptive statistics
- ii. Regression analysis

2.4.1 Simple Descriptive statistics

Descriptive statistics such as frequency counts and percentages, and pie charts were used.

2.4.2 Regression Analysis

This was used to determine whether or not show if there was any relationship between selected socio-economic variables and the use of mobile phones. The deficiency was considered significant at $P < 0.05$ to interpret the hypothesis formulated.

3.0 RESULTS AND DISCUSSION

3.1 Socio-economic Characteristics of Sampled Respondents

Some socio-economic characteristics are known to influence the use of mobile phones in improving livelihood among horticultural farmers in different parts of Kaduna Northern

Guinea Savanna Eco-region. The variance employed in the study include; aAge, sSex, mMarital status, household size, education, years of ownership of phones, etc.

Table 1: Socio-economic characteristics of horticultural crop farmers.

S/NR	Variance	Frequency	Percentage %
1	Age (Years)		
	10-20	12	15.79
	21-30	19	25.0
	31-40	20	26.32
	41-50	15	19.74
	51-60	10	13.16
2	Marital Status		
	Married	42	55.26
	Single	15	19.74
	Divorcee	07	9.21
	Widow/Widower	12	15.79
3.	Gender		
	Male	35	46.05
	Female	41	53.95
4	Household size		
	1-5	20	26.32
	6-10	30	39.47
	11-15	10	13.16
	16-20	09	11.84
	21 and above	07	9.21
5	Education		

Primary	20	26.31
Secondary	40	52.63
Tertiary	10	13.16
Non formal	06	7.89
6 Years of Ownership of Phones		
1-3	20	26.31
4-6	40	52.63
7-9	10	13.16
10 and above	06	7.89
7 Source of Fund for Mobile Phone		
Personal Savings	43	56.58
Gift	20	26.31
Bank Loan	13	17.11
Total	76	100

Table 1 showed that the majority (26.32%) of the respondents were middle-aged (between 31-40 years). This ~~The~~ category of people falls into the energetic force in the horticultural sector. There were more females (53.95%) than male (46.05% in the sample indicating that horticultural sector is dominated by female farmers. The mMajority (55.26%) of the respondents were married, 15.79% widowed/widower, 9.21% separated or divorced and 19.74% were are single. Data showed that 52.63% had secondary education, 13.16% graduated from tertiary institutions and 26.31% had primary education. Only 7.89% did not attend formal educational schools. This result indicates that most horticultural crops farmers had formal education good enough ~~are well educated~~ to efficiently operate handsets with minimum difficulty and to respond positively to information from mobile phones. (15), observed that formal education has positive influence on farmers and the general society at large.

The result also showed that 52.63% have owned mobile phones for 4-6years, 26.31% for 1-3years, 13.16% for 7-9 years and 7.89% owned mobile phones for 10years and above. This implies that the technology is gradually gaining acceptance among the rural horticultural farmers. A ~~s~~ majority (56.58%) of the respondents purchased their handsets through personal savings and only 26.31% got theirs through gifts from friends and relatives. This implies that most rural people are no longer seeing mobile phones as luxury but as a necessity/asset because of its strategic importance to their lives. The result also suggests that horticultural

crop farmers acknowledge the usefulness of mobile phones in their livelihood pattern and the number of years' farmers have owned mobile phones may be related to the relatively higher level of education in the study area. In comparison, the average proportion of rural farmers with secondary education in Nigeria is xx.x%. There were variations in the household size of the families, 39.47% had between 6-10 members, 26.32% had between 1-5 members, 13.16% had 11-15 members, 9.21% had 21 and above while 11.84% had 16-20 members. This is typical of most rural Nigeria communities where polygamy and having large households is a sign of wealth and opportunity for adequate farm labour. The above results of socio economic characteristics agree with the findings (16) that socio-economic characteristic influence horticultural productivity in rural areas of Nigeria.

Comment [BTHM19]: Add detail.

Comment [BTHM20]: This is the kind of comparative analysis that makes your paper stronger.

Comment [BTHM21]: This cannot be horticultural productivity because nowhere in the discussion was there mention of horticultural crop yields. I suggest this be changed to "mobile phone usage within the smallholder horticultural sector".

3.2 Perception of Horticultural Crops Farmers on How Mobile Phones have improved their Livelihoods.

Perceptivity of horticultural farmers on how mobile phones have connected to different aspects of livelihoods to indicate their level of agreement on contribution of mobile phones to items expressed. The livelihood aspects as presented in table 2 were drawn from various components of the sustainable livelihood framework.

Table 2: Perception of Horticultural Crops Farmers on How Mobile Phones have improved their Livelihoods.

S/N	Use of Mobile Phones	Agree	Percentage (%)	Disagree	Percentage (%)
1.	Improve social interaction amongst horticultural crop farmers	70	92.11	6	7.89
2.	Reduce cost of crop of transportation from one market to another in search for good sale	73	96.05	3	3.95
3.	Facilitate fast respond through emergency call	75	98.68	1	1.32
4.	Provide quick information availability and market price of farm inputs	71	93.42	5	6.58
5.	Obtain current sales prices of horticultural crop from bigger market to facilitate bargaining	65	85.53	11	14.47
6.	Reduce exploitation/low pricing of middle men and improved income of	64	84.21	12	15.79

	producers.				
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Table 2 revealed that most of the horticultural crop farmers agree that mobile phones facilitate fast response to emergency calls (98.68%), cost of transportation reduced (96.05%), quick information on availability and market price of farm inputs (93.42%), level of interaction improved (92.11%), sales prices of horticultural crops (85.53%) were readily obtained. Lastly, exploitation by middle men were reduced (85.21%) because producers could access sales prices from other markets that helped them to bargain. This in turn facilitates a significant improvement in Thus, the farmers's incomes improved significantly. The results agreed with that of (9) who reported that mobile phones increase livelihood of horticultural farmers in rural areas.

3.3 Horticultural Farmers Constraints in the Use of Mobile Phones

The farmers faced with the enormous constraints in the use of mobile phones in the study area. Some of the constraints observed are shown/discussed in Table 3 below.

Table 3: Horticultural Farmers Constraints in the Use of Mobile Phones

S/N	Constraints	Frequency	Percentages (%)
1.	High cost of recharge cards	10	13.16
2.	Network/signal problems	30	39.47
3.	Loss/theft of mobile phones	08	10.53
4.	Lack of electricity to charge mobile phones	15	19.74
5.	Technical problem	06	7.89
6.	Limited coverage	03	3.95
	Total	76	100

Comment [BTHM22]: OK

Table 3 showed that the major problem faced by most of the horticultural crop farmers in the use of mobile phones in the rural areas is poor network (39.47%) and it was also, observed that sometimes, rural horticultural farmers have to climb trees, hills and so on to set network received networks. Perhaps this might be due to service provider focus on towns and cities with high population and patronage. However, if this assumption is true, it means that low population density of rural areas discourages service provider from setting up their mass. Lack of electricity to charge phones (19.74%), high cost of recharge cards (13.16%) Which

agree with (17) that high cost of recharge cards limiting the Use of mobile phones in the rural community. Theft/loss of handsets (10.53%), limited coverage (5.26%) and fraud (3.95%) were some of the challenges faced by the horticultural crop phone users. However, farmers noted that dependence on power from generators was expensive, those who use generators to recharge phone batteries see it as a good business.

3.4 Test of Hypothesis

H^1_0 : There is no significant relationship between selected socio-economic characteristics of rural horticultural farmers and their perception on the contribution of mobile phone to improvement of rural livelihood

Table 4 Regression Analysis on Selected Socio-economic Characteristics and Horticultural Crops Farmers' Perception of the use of Mobile Phones for Livelihood Improvement.

Variable	Regression Coefficient	Table Values
Constant	0.20902	18.39
Age	0.2965	1.422**
Household Size	0.1805	0.78*
Educational Status	0.297	0.16**
Years of Possession	-0.4393	0.51
S=24.33	R.Sq=52.2%	R.Sq(adj) 50.0%

Table 4 shows that the age, household size, education status are the most important variables, explaining horticultural crop farmers' perception of the contribution of mobile phone to improvement of rural livelihood and they were all significant at $(P<0.05)$. This also emphasized the importance of education, family size and age in the use of mobile phone to the improvement of rural livelihood.

Comment [BTHM23]: To show this please add another column highlighting the level of significance for each variable.

4.0 CONCLUSION AND RECOMMENDATION

4.1 Conclusion

The study shows that mobile phones have contributed immensely to the improvement of rural horticultural crop farmer's livelihood through better social contacts, reduced transport cost, obtaining help in emergency situations, obtaining market prices of farm inputs when necessary. However, poor network, lack of electricity to charge handsets and high cost of recharge cards are hampering the effective utilization of mobile phones for maximum benefits in rural areas.

4.2 Recommendation

Based on the above findings, it is recommended that government improve electricity supply to rural farm communities and mobile phone service providers improve their network so that rural horticultural communities' farmers can benefit from the services mobile phones to improve production. Furthermore, the state and local government should improve rural electricity supply to enable rural horticultural crops farmers utilize the full potentials of mobile phones for improved performance.

Comment [BTHM24]: This recommendation should be more robust, feasible and practical. See comment # 4 above.

Comment [BTHM25]: The abstract also recommends a cut/reduction in call rates, which is not included in this section. See comment # 5 above.

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Comment [BTHM26]: SPACING

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