

1 | **USAGE OF MOBILE PHONES ~~IN IMPROVING LIVELIHOOD~~ AMONG**
2 | **HORTICULTURAL FARMERS IN PARTS OF KADUNA NORTHERN GUINEA**
3 | **SAVANNAH ECO-ZONE: EMPIRICAL STUDY OF IGABI LOCAL GOVERNMENT**
4 | **AREA OF KADUNA STATE**

Formatted: Numbering: Continuous

5 |
6 | **ABSTRACT**

7 | The study examined the use of mobile phones in improving the livelihood of rural
8 | horticultural crops farmers in Igabi Local Government Area of Kaduna State. Eighty (80)
9 | questionnaires were sampled among horticultural crop farmers who own and use mobile
10 | phones and seventy-six (76) questionnaires were retrieved. A multistage sampling technique
11 | was used in sampling the respondents. The data collected were analyzed using descriptive
12 | statistics and regression analysis. The results showed that 46.05% are males and 53.95% are
13 | females. 26.32% were between 31-40 years, 55.26% were married and 52.63% had at least
14 | secondary education. 52.63% have owned handsets for at least 4-6years and 56.58% obtained
15 | the sets from personal savings. Mobile phone usage improved the livelihood in reducing
16 | transport cost (96.05%), reduced exploitation/low pricing by middlemen and improved
17 | income of producers (84.21%). It also enhanced interaction among rural horticultural crop
18 | farmers at different locations (92.11%). Poor network coverage (39.47%) poor power supply
19 | (19.74%) and theft/loss of handsets (10.53%) were the major constraints associated with
20 | mobile phone usage. The regression analysis showed significant relationship between age,
21 | household size, educational status and use of mobile phone at (P<0.05) level of significance.
22 | Therefore, it is recommended that the federal government makes law that the GSM service
23 | providers minimizes network problems and reduce call rates while state and local government
24 | improve rural electricity supply to enable rural horticultural crop farmers utilize the full
25 | potentials of mobile phones for improved performances.

26 | **Key Words:** Mobile phone, Horticulture, Farmers, livelihood, Improving,

27 | **1.0 INTRODUCTION**

28 | One of the biggest concerns of farmers globally is the need to increase agricultural
29 | productivity and production efficiencies. This holds true both for horticultural production
30 | producing for the market or purely for self-consumption. The productivity and profitability of
31 | smallholder farmers are often limited by a number of factors that are out of their control; the
32 | increasingly erratic vagaries of technology, climate; global commodity prices; and policies
33 | (1). All of these factors are further compounded by the relative lack of technical and financial
34 | services and dearth of information (e.g. about prices, market requirements). Information and
35 | Communication Technologies (ICTs) are seen as revolutionary agents of change in the field
36 | of agriculture, providing a number of tools that can help the smallholder farmer, primarily
37 | through improving the quality and quantity of information available to them. More
38 | specifically, many of the tools and those that perhaps hold the greatest promise are those that
39 | utilize mobile technologies. Mobile adoption in the developing world is occurring rapidly: in
40 | such a way that the rate of increase is greater than that of the developed world, (2).
41 | Conversely, have witnessed the development of mobile phones, or mobile technology, as a
42 | major driver of economic growth. In addition, phone has provided new opportunities to

43 address the challenges faced by horticultural farming. For example, increasing use of mobile
44 phones for information exchange, such as disease surveillance and pest tracking, is now
45 common practice. Linking knowledge to innovation is also crucial to addressing the
46 information and knowledge gaps in the agriculture sector. (3) . Therefore, mobile phone can
47 also play a very important role in bridging information gaps. FAO has been promoting the
48 use of ICTs in agriculture and has focused on ICT innovation for improving agricultural
49 production and enhancing value chains. Mobile phone technology has rapidly expanded all
50 over the world as well as in developing countries (4).

51 Mobile phones, which is an integral part of ICT, has become an information communication
52 of our time and their increased number of growth rates have been attributed to many factors
53 including the liberation of the communication. Government of many developing countries
54 and development agencies are focusing on extending ICT information structure into rural
55 areas as they seek to encourage growth, alleviate poverty and become the perceived digital
56 divide (5) this plans would also accelerate food production since the majority of the consume
57 are exported. According to (6), mobile phones area ideal areas cheap to set up, easy to use
58 and filling a vital nee. Today in Nigeria, most rural farming communities have access to
59 mobile phone services, which has enabled closer contact between them and development.
60 (7,4) have separately shown that in developing countries information and communication
61 technologies (ICTs) such as mobile phones can impact on rural livelihood and on poverty in
62 the following areas: increased opportunity to access resources, empowerment through
63 information about choices that affected them, decreased vulnerability to risk due to the
64 possibility to send and receive information (8).

65
66 About 75% of horticultural farmers live in rural areas where they are struggling for their
67 basic need (9).Their living standard is very low which limited them to the use of information
68 technology (ICT) in which mobile phone is an integral part; to increase and improved their
69 livelihood and horticultural farming activities in transferring vital information on new ideals
70 of modern method of raising various horticultural crops; combating outbreak of pest and
71 diseases; seeds improvement and use of genetically modified seeds which can give them
72 quick returns, fertilizer application and various ways of improving soil fertility. The advent of
73 ICT to our horticultural farmers (mobile phones) will not only guarantee the poor rural
74 communities to create and share knowledge on various horticultural systems that could lift
75 them out of poverty level but in all areas of life that improve their standard of living and
76 sustainability. Mobile phone services should be in use to access horticultural market
77 information and knowledge, increase the agriculture business by improving the productivity,
78 especially for developing countries. Mobile phones which are normally in use to
79 communicate with family and friends could be used for horticulture business stakeholders.
80 Phone could be good device to make strong relationship with all horticulture business
81 stakeholders by communication, SMS, email thus benefiting farmers by timely market
82 information to increase the income and decrease the poverty.

83
84 Although mobile communication has quickly become the important part of rural population,
85 its applications are not so good for farmers because most of these applications are not related

86 to livelihood and environment of rural areas farmers. These mobile phone applications
87 generally do not follow any generic blueprint and design for specific target market and
88 having the localized contents (10). Most of mobile applications are not user-friendly and we
89 should consider the illiteracy of farmers when developing such mobile application. The
90 information such as horticulture, marketing, weather, advices should be local based and in
91 local language. There are also educational and social barriers which need to be broken by
92 academic institutions and proper interest of religious, government, NGOs, Mobile phone
93 companies and development participants (11). Infrastructure and cost are also big issues to
94 consider in mobile phone technology. The objective of the study is to examine perception of
95 rural horticultural crop production on the usage of mobile phones in improving livelihood
96 among horticultural farmers in parts of Kaduna Northern Guinea Savanna Eco-zone.

97

98 **1.1 Hypothesis**

99 H_0 : There is no relationship between selected socio-economics characteristics of
100 the rural horticultural farmers and their perception of contribution of mobile
101 phone to improvement of rural livelihood.

102 H_1 : There is relationship between selected socio-economics characteristics of the
103 rural horticultural farmers and their perception of contribution of mobile
104 phone to improvement of rural livelihood.

105

106 **2.0 MATERIALS AND METHOD**

107

108 **2.1 Study Area**

109 The study was carried out in Igabi Local Government Area (LGA) of Kaduna State. Igabi is
110 located in Northern Guinea Savanna region of Nigeria on latitude $10^{\circ}E$ $37^{\circ}N$ and 10° $41^{\circ}N$
111 and longitude 7° $47^{\circ}E$ (12). Igabi Local Government Area shares boundary with Kaduna
112 South, Kaduna North, Giwa Local Government and Zaria Local Government Areas of
113 Kaduna State. It has an annual rainfall of about 1000mm-1500mm per annum. Major crops
114 grown in the area include maize, cassava, millet, sorghum, guinea-corn, water-melon etc. The
115 area consists of different tribes and ethnic groups such as Yoruba's, Hausa, Igbos, Fulani's,
116 Gbagyi's, Ebira's living together in peace and harmony but predominant tribal majorities are
117 Gbagyi's and Hausa's. The area has an estimated population of about 570,000 people and
118 covers an area of about 4556.95 square kilometer with annual rainfall of 1000mm-1500mm
119 (13).

120 **2.2 Method of Data Collection**

121 Primary data and secondary data were used for this study. The primary data was
122 collected through structure questionnaires while secondary data was sourced from
123 past survey data, internet, magazine and journals. The questionnaires were designed to
124 collect the following types of information;

- 125 i. socio-economic characteristics of the respondents in the study area?
126 ii. perception of horticultural crops farmers on how mobile phone have improved in
127 the study area?

128 iii. Determine the relationship between the selected socio-economic variables and the
129 use of mobile phoned.

130

131 **2.3 Sampling Techniques**

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

140

141 **2.4 Analytical Tools**

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

- 143 i. Descriptive statistics
- 144 ii. Regression analysis

145 **2.4.1 Simple Descriptive statistics**

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

147 **2.4.2 Regression Analysis**

148 This was used to show if there is any relationship between selected socio-economic variables
149 and the use of mobile phones. The deficiency will be considered significant at $P < 0.05$ to
150 interpret the hypothesis formulated.

151 **3.0 RESULTS AND DISCUSSION**

152 **3.1 Socio-economic Characteristics of Sampled Respondents**

153 Some socio-economic characteristics are known to influence the use of mobile phones in
154 improving livelihood among horticultural farmers in different parts of Kaduna Northern
155 Guinea Savanna Eco-region. The variance employed in the study include; Age, Sex, Marital
156 status, household size, education, years of ownership of phones etc.

157

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

159

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

160

161 Table 1 showed that majority (26.32%) of the respondents were middle-aged (between 31-40
 162 years). The category of people falls into the energetic force in the horticultural sector. There
 163 were more females (53.95%) than male (46.05% in the sample indicating that horticultural
 164 sector is dominated by female farmers. Majority (55.26%) of the respondents were married,
 165 15.79% widowed/widower, 9.21% separated or divorced and 19.74% are single. Data showed
 166 that 52.63% had secondary education, 13.16% graduated from tertiary institutions and
 167 26.31% had primary education. Only 7.89% did not attend formal educational schools. This
 168 result indicates that horticultural crops farmers are well educated to efficiently operate
 169 handsets with minimum difficulty and to respond positively to information from mobile
 170 phones. (15), observed that formal education has positive influence on farmers and general
 171 society at large.

172 The result also showed that 52.63% have owned mobile phones for 4-6years, 26.31% for 1-
 173 3years, 13.16% for 7-9 years and 7.89% owned mobile phones for 10years and above. This
 174 implies that the technology is gradually gaining acceptance among the rural horticultural
 175 farmer's majority (56.58%) of the respondents purchased their handsets through personal
 176 savings and only 26.31% got theirs through gift from friends and relatives. This implies that
 177 most rural people are no longer seeing mobile phones as luxury but as a necessity because of
 178 its strategic importance to their lives. The result also suggests that horticultural crop farmers
 179 acknowledge the usefulness of mobile phones in their livelihood pattern and the number of
 180 years' farmers have owned mobile phone may be related to the level of education in the study
 181 area. There were variations in the household size of the families, 39.47% had between 6-10
 182 members, 26.32% had between 1-5 members, 13.16% had 11-15 members, 9.21% had 21 and
 183 above while 11.84% had 16-20 members. This is typical of most rural Nigeria communities
 184 where polygamy and having large households is a sign of wealth and opportunity for
 185 adequate farm labour. The above results of socio economic characteristics agree with the
 186 findings (16) that socio-economic characteristic influence horticultural productivity in rural
 187 areas of Nigeria.

188 **3.2 Perception of Horticultural Crops Farmers on How Mobile Phones have improved**
 189 **their Livelihoods.**

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

194

195 **Table 2: Perception of Horticultural Crops Farmers on How Mobile Phones have**
 196 **improve 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 producers.	64	84.21	12	15.79

197

198 Table 2 revealed that most of the horticultural crop farmers agree that mobile phone facilitate
 199 fast response to emergency calls (98.68%), cost of transportation reduced (96.05%), quick
 200 information on availability and market price of farm inputs (93.42%) level of interaction
 201 improved (92.11%), sales prices of horticultural crops (85.53%) were readily obtained.
 202 Lastly, exploitation by middle men reduced (85.21%) because producers could access sales
 203 prices from other markets that helped them to bargain. Thus, the farmer's income improved

204 significantly. The results agreed with that of (9) who reported that mobile phones increase
205 livelihood of horticultural farmers in rural areas.

206

207 3.3 Horticultural Farmers Constraints in the Use of Mobile Phones

208 The farmers faced with the enormous constraints in the use of mobile phones in the study
209 area. Some of the constraints observed are discussed in table 3 below.

210 **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

211

212 Table 3 showed that the major problem faced by most of the horticultural crop farmers in the
213 use of mobile phones in the rural areas is poor network (39.47%) and it was also, observed
214 that sometimes, rural horticultural farmers have to climb trees, hills and so on to set network
215 received networks. Perhaps this might be due to service provider focus on towns and cities
216 with high population and patronage. However, if this assumption is true, it means that low
217 population density of rural areas discourages service provider from setting up their mass.
218 Lack of electricity to charge phones (19.74%), high cost of recharge cards (13.16%) Which
219 agree with (17) that high cost of recharge cards limiting the Use of mobile phones in the rural
220 community. Theft/loss of handsets (10.53%), limited coverage (5.26%) and fraud (3.95%)
221 were some of the challenges faced by the horticultural crop phone users. However, farmers
222 noted that dependence on power from generators was expensive, those who use generators to
223 recharge phone batteries see it as a good business.

224

225

226

227 **3.4 Test of Hypothesis**

228 **H¹₀:** There is no significant relationship between selected socio-economic
229 characteristics of rural horticultural farmers and their perception on the
230 contribution of mobile phone to improvement of rural livelihood

231
232 **Table 4 Regression Analysis on Selected Socio-economic Characteristics and**
233 **Horticultural Crops Farmers' Perception of the use of Mobile Phones for**
234 **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%

235
236 Table 4 shows that the age, household size, education status are the most important variables,
237 explaining horticultural crop farmers' perception of the contribution of mobile phone to
238 improvement of rural livelihood and they were all significant at (P<0.05). This also
239 emphasized the importance of education, family size and age in the use of mobile phone to
240 the improvement of rural livelihood.

241
242

243 **4.0 CONCLUSION AND RECOMMENDATION**

244 **4.1 Conclusion**

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

251 **4.2 Recommendation**

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

258

259 REFERENCE

- 260 1. . Gubbin J., Buyya, R., Marusic, S., and Palaniswami, M. (2013). Internet of Things
261 (IoT): A Vision, Architectural Elements, and Future Directions. *Future Generation*
262 *Computer Systems*.29(7):1645-1660.
263 [http://www.academia.edu/1829377/Research Methodology-](http://www.academia.edu/1829377/Research_Methodology-)
264
- 265 2. International Communication Union (2006). *World Telecommunication/ICT*
266 *Development Report: Measuring ICT for Social and Economic Development*. ITU,
267 Geneva.
268
- 269 3. Hwang, J., Shin, C., and Yoe, H. (2010). Study on an Agricultural Environment
270 Monitoring Server System Using Wireless Sensor Networks. *Sensors*. 10(12): 11189-
271 11211.
272
- 273 4. Oluyaire, B. (2018). Assessing of social media for agricultural information,
274 dissemination among farm youth in rural communities of FCT, Nigeria. M. Phil
275 thesis; Dept. of Agricultural extension and Rural Sociology Obafemi Awolowo
276 University Ile-Efe, Osun State.Pp15
277
- 278 5. Samuel, J. Shah, N. and Hadingham, W. (2005). "Mobile Communications in South
279 Africa, Tanzania, and Egypt: Results from Community and Business Surveys," In
280 Africa: The Impact of Mobile Phones. *Moving the Debate Forward: The Vodafone*
281 *Policy Paper Series* (3):44-52.
282
- 283 6. Mundy, P and Sultan, J (1999). *Information Revolution: Information and*
284 *Communication Management is Changing the lives of Rural People*. The Netherlands
285 Technical Centre for Agriculture and Rural Cooperation (CTA). Pp19
286
287
- 288 7. Waveman, L., Meschi, M and Fuss, M (2005). *Vodafone Policy Paper: The Impart of*
289 *Telecoms on Economic Growth in Developing Countries*
290 http://www.vodafone.com/assets/files/en/AIMP_09032005.pdf
291
292
- 293 8. Information for Development Program (2006). *Impact of Mobile Phones on Rural*
294 *Livelihood Assets in Rural Nigeria. A Case Study of Ovia North East Local*
295 *Government Area*. In Onwuebele, Andrew (Eds.). *Jorin* 9 (2). ISSN: 1596 -8308.
296 www.transcampus.org.www.oyol.info/journals/jorind.

297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342

9. Sood, A.D (2006). The Mobile Development Report: The Socio-Economic Dynamics of Mobile Communication in Rural Areas and their Consequences for Development. <http://cks.in/mdr/Mobile%20Development%20Report.Updated.pdf>.
10. Lanjouw E. and Lanjouw, B. N. (2001). Effective utilization of information communication technology (ICT): resources for national development. *Nigerian Journal of Unity and Development* 2(1). :) 24-27
11. Donnei, F. (2002). "Going wireless: behavior and practice of new mobile phone users "; Proceedings from the 2000 ACM Conference on Computer Supported Cooperative Work, Philadelphia, PA, ACM Press,
12. Otegbeye G.O. Owonubi, J.J., Oviasuyi, P.K. (2001). Interspecific variation growth of Eucalyptus growing in Northern Nigeria. *Proceeding of 27th Annual conference of Forest Association, Nigeria. Pp. 12-16*
13. NPC (2006). Nigerian Population Commission of Nigeria Bulletin. Pp 13.
14. Sodimu, A.I., Apah, J., Usman, M.B., Suleiman, R.A. and Lapkat, G. L (2020). Medicinal Utilization of *Hydrocotyle asiatica Linn.* In Kaduna North Local Government Area of Kaduna State Nigeria. *European Journal of Medicinal Plant.* 31 (1) 70-76. ISSS:2231-0894 DOI:10.9734/ejmp/2020/V31.130207. www.journalejmp.com.
15. Sodimu, A.I., Akinyemi, O., Adejoba, O. R and Akande, M. T (2010). Constraint and Profitability Assessment of Modern Beekeeping Technology in Kudan Local Government Area of Kaduna State. *African Journal of Agricultural Research and Development.*Vol.3, No:3. Pp 7-10. ISSN: 2141-0097.
16. Sodimu, A.I., Adebayo, O.O., Olorukooba, M.M. and Sambo, B.E. (2006). Problems Faced by Leafy Vegetable Farmers in Chikun Local Government Area of Kaduna State, Nigeria. *International Journal of Food and Agricultural Research* Vol. 3. No.1. Pp 80 – 84. ISSN: 0189-7136
17. Odiaka, E.C (2012). Mass Media Usage. Lambert Academic Publishing GMBH and Co.KG, Germany.

343 .

344

345

UNDER PEER REVIEW