

GENDER USE OF GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS IN AGRICULTURE IN ABUJA, NIGERIA

Julius AJAH *

Abstract

The study examined gender use of Global System for Mobile Communication (GSM) in Abuja, Nigeria. The main objective is to verify if significant difference exists in the male and female farmers' use of GSM phones. A multi-stage technique was used to select respondents in four Area Councils (Kwali, Kuje, Gwagwalada and Abaji) while questionnaires were used for data collection. A total of 380 small-scale farmers (195 males and 185 females) were randomly interviewed. Data were analysed using a two-way mixed analysis of variance (ANOVA). Results indicated that, on average, there was no significant difference ($p > .05$) in gender use of GSM phones in agriculture but there was significant ($p < .05$) interaction of gender and location implying that gender use of GSM phones significantly varied in some locations. Although there was no significant difference in gender use of GSM phones, the mean responses indicated that the female farmers relatively used GSM phones more than their male counterparts. Majority of the male and female farmers indicated that they used GSM phones for communication especially to get information on market prices of goods and services while they hardly use it to transfer money for business transactions. Based on findings, the study concluded that there was no significant difference in gender use of GSM phones in agriculture in the study area but there were variations in some locations.

Key words: GSM phones, Area councils, Agriculture, Male farmers, Female farmers

* **Department of Agricultural Economics/Extension, Faculty of Agriculture, University of Abuja**

INTRODUCTION

The introduction of Information Communication Technologies (ICT) has revolutionized agriculture by bridging the gap between the stakeholders in the agricultural and non-agricultural sectors. One of the ICT is Global System for Mobile Communications (GSM) commonly known as telephone in Nigeria. Among the ICT, GSM phones have contributed immensely to agricultural development especially in the transformation of rural economies. It was introduced in Nigeria in 2001 (Okeke, 2014) indicating that it is a recent technology in the Nigerian history. Since its introduction, Adeleke and Aminu (2012) affirmed that Nigeria has maintained the lead in Africa with about 92,006,608 active subscribers representing a Tele-density of about 68.85 percent. Among other ICT, Okeke (2014) argued that it is the most popular means of voice communication in Nigeria. Apart from the fact that it is user-friendly, it has comparative advantages over other ICT and this is largely due to its multiple uses. Ademola, James and Kehinde (2013) stated that GSM phones have the potential to reduce and/or eliminate transportation costs through call or Short Message Services (SMS).

In agriculture, male and female farmers use GSM phones in carrying out some responsibilities or activities and this brings us to the concept of gender use of GSM phones in agriculture. It is a recent technology that attracts attention because of gender division of labour in agriculture. It deserves attention because evidence from literature, showed that in some societies or cultures, male and female farmers carry out different responsibilities. For instance, report by World Bank (2003) indicated that women, depending on the region, make up 60 – 80 percent of agricultural labour in Nigeria and accounts for about two-third of food crops produced. Similarly, Afolabi (2008) affirmed that women are more in the production and processing of arable crops as well as staple food items. Other scholars (Blackden and Woden, 2006; Mehra and Rejas, 2008) corroborated the fact that male and female farmers are involved in agriculture but argued that the female farmers are more involved than their male counterparts. Although empirical evidence suggests that female farmers are more involved in agriculture, it should be noted that the male farmers also play significant roles in agricultural development.

Since gender roles differ in agriculture, the question is, does it translate into differences in gender use of GSM phones in agriculture? For example Ajah, Unamma and Nwachukwu (2011), stated that there were significant variations in gender involvement in farm operations in the Southeast

Nigeria. Male farmers according to the report, were significantly more involved in site selection, bush clearing, raking/burning, weeding and fertilizer application while the female farmers were more involved in planting, harvesting, transportation of farm produce storage and marketing. In carrying out these farm operations, GSM phones are used in one way or the other, to communicate or negotiate with other stakeholders. But, the issue is: Does the differences in the male and female farmers' level of involvement in farm operations reflect on the use of GSM phones? The answer to this question formed the basis for this research. Other questions addressed in the study are: Apart from gender, are there significant locational differences in farmers' use of GSM phones? What specific activities do the male and female farmers use GSM phones to do? What are the factors limiting gender use of GSM phones in the study area?

The study is very important because gender issues are important elements in rural and agrarian transformation in all ramifications. As an important concept in agricultural development, World Bank (1995) stressed that, if disparities exist between men and women in terms of statuses, control of assets, access to resources and decision-making powers, sustainable and equitable development would be undermined. On the other hand, Dauda *et al.*, (2009) stated that communication is a critical element in finding solutions to problems of food production because it facilitates research-farmer linkage using ICTs. Again, Kurtenbach and Thompson (1999) noted that an understanding of the factors associated with the adoption and use of ICT will facilitate the development of strategies that will favour and promote effective and efficient use of information in agriculture. Furthermore, the study is vital because FAO (2011) stated that closing the gap between male and female farmers would increase agricultural production, reduce poverty/hunger and promote sustainable development.

OBJECTIVES

The main objective of the study is to determine if significant difference exists in gender use of GSM phones in agricultural production in Abuja, Nigeria. Specific objectives are to:

1. Verify if there are significant differences in gender use of GSM phones
2. Determine if there are locational differences in gender use of GSM phones.
3. Determine the uses of GSM phones by male and female farmers.
4. Identify the factors influencing gender use of GSM phone in agriculture

HYPOTHESES

1. Ho: There is no significant difference in gender use of GSM phones in agriculture
2. Ho: There is no significant locational differences in gender use of GSM phones
3. There is no significant interaction of gender and location.

METHODOLOGY

The study was conducted in Abuja in the North Central Zone, Nigeria also known as the Federal Capital Territory. It is located between latitudes $8^{\circ} 25'$ and $9^{\circ} 25'$ North of the equator and longitudes $6^{\circ} 45'$ and $7^{\circ} 45'$ East of Greenwich. The population for the study comprised all small-scale male and female farmers. The sampling technique adopted was multi-stage while semi-structured questionnaires were used for data collection. In the first stage, four Area Councils (Kwali, Kuje, Gwagwalada and Abaji) were purposively chosen out of six because of the predominance of agricultural activities. In the second stage, five (5) communities were purposively chosen from each of the four area councils. Finally, in each of the selected communities, 20 small-scale farmers (10 males and 10 females) were randomly interviewed given a total of 400 respondents. Out of the 400 questionnaires only 380 (195 males and 185 females) were properly filled and used for the study. A two-way independent ANOVA was used for data analysis and it is expressed mathematically as:

$$Y_{ijk} = \mu + G_i + L_j + GL_{ij} + e_{ijk} \dots\dots\dots 1$$

Where:

Y_{ijk} = Individual farmer's response regarding his/her use of GSM phones in agriculture

μ = General mean

G_i = Refers to the gender of the farmer (main effect of gender on the use of GSM phones)

F_j = Refers to location (main effect of location)

GF_{ij} = interaction effect of gender and location (Gender*location)

e_{ij} = error term

Model 1 contains two factors - gender with two levels (male and female) and location with four levels (Kwali, Kuje, Gwagwalada and Abaji). Location was introduced to determine if there are locational differences in gender use of GSM phones. The dependent factor in the model is "use

of GSM phones” and by interpretation, the model states that the use of GSM phones by farmers (Y_{ijk}) depends on gender (G_i), the location of the farmer in Abuja (L_j) and the interaction of gender and location (GF_{ij}). The error term is represented by e_{ijk} while μ is the population mean. Gender use of GSM phones in agriculture was verified using a rating scale of: *very useful* (3), *moderately useful* (2), *fairly useful* (1) and *not useful at all* (0). The scores obtained from the responses were used for analysis in line with the method applied by Ajah (2015), Robert (2011), Field (2005) and Shah and Madden (2004). SPSS 18.0 was used to run the analysis and mean separation was done using Bonferroni model at 5 percent probability level.

RESULTS AND DISCUSSION

Table 1 contains the ANOVA results carried out to determine if significant difference exists in male and female farmers’ use of GSM phones. The farmers were asked to rate their usage of GSM phone using a 4-point scale. The ANOVA results showed the main effects of gender, the main effect of location and the interaction effect of gender and location. For a clear understanding of the results, the mean responses are presented in charts.

Table 1: ANOVA results on gender use of GSM in agriculture

Sources of variation	Df	SS	MS	F-cal	P-value
Gender	1	0.12	0.12	0.31	.58
Gender*location	3	5.24	1.75	4.57	.00
Location	3	26.77	8.92	23.33	.00
Error	372	142.31			

The result showing the main effect of gender on GSM phones usage is shown in row one of the ANOVA Table 1. It compares gender use of GSM phones in the entire study area hence the question is: Regardless of location (irrespective of location), do male and female farmers significantly differ in their use of GSM phones in agriculture? It tests the hypothesis which states that there is no significant difference in the male and female farmers’ use of GSM phones in Abuja ($\mu_{\text{Male farmers}} = \mu_{\text{Female farmers}}$). The result, $F(1, 372) = 0.31, p = 0.58$, indicated that there was no significant difference ($p > .05$) in gender use of GSM phones thus the null hypothesis was accepted. In other words, there was no strong evidence to conclude that the male and female

farmers significantly differed in their use of GSM phones. This result tallies with the findings of Rees and Noyes (2007) which showed that there was no significant difference in mobile phones usage between men and women in the UK. Although there was no statistical evidence to show that the male and female farmers differed in their use of GSM phones, the mean response (Fig 1) showed that the female farmers relatively used GSM phones more than the male farmers. This is contrary to Olatokun (2009) which revealed that male respondents were able to use most of the ICT than their female counterparts. Since data were collected from different geographical locations (area councils), further analysis was done to verify if there was significant interaction of gender and location (Fig 2).

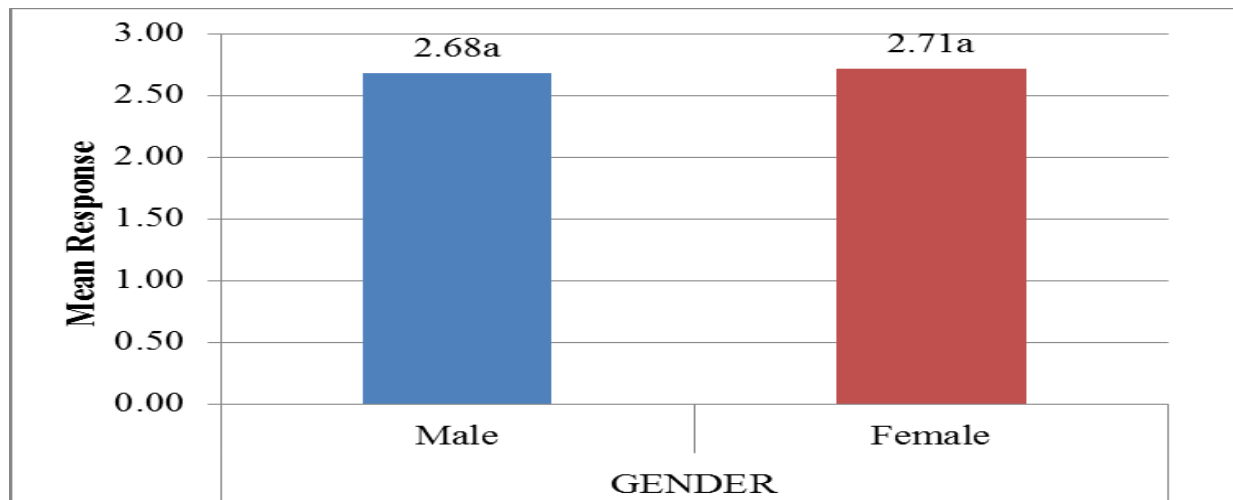


Fig 1: Differences in gender use of GSM in agriculture (irrespective of location)
Note: Means with the same alphabet do not significantly differ from each other

The result showing gender use of GSM phones in each of the area councils sampled (Gender*location) is shown in row two of ANOVA Table 1. It shows how the male and female farmers rated their use of GSM phones in each of the four locations. The question is: Are there significant differences in gender use of GSM phones in each of the locations (area councils sampled)? It tests the hypothesis which states that there is no significant difference in the male and female farmers' use of GSM phones in each of the locations. The results, $F(4, 327) = 573, p = 0.00$, shows that there was significant interaction ($p < .01$) hence the null hypothesis was rejected. Mean separation (Fig. 2) showed that the male and female farmers significantly differed in their use of GSM phones in Kwali and Abaji Area Councils but they did not significantly differ in Gwagwalada and Kuje Area Councils. In Abaji Area Council, the male farmers

significantly used GSM phones more than the female farmers while the reverse is the case in Kwali Area Council. This is contrary to apriori expectation and calls for further investigation to determine the causes of the variations. Perhaps, it may be due to cultural diversity because in the rural Pakistan, conservative opinions believed that mobile phones would give women secret access to nefarious influences (from males) and for this reason, women faced a digital divide (Society, 2010). To corroborate this, a woman from Cameroon was quoted to have said: “My husband won’t let me have a cell phone; I have asked him several times to get me one. He answers that if I want a divorce, I just have to say so” (Gender and ICT Network, 2006). This is a clear case of gender marginalization (intimidation) and has to be discouraged in all societies for GSM phones to make the desired impact in the rural communities.

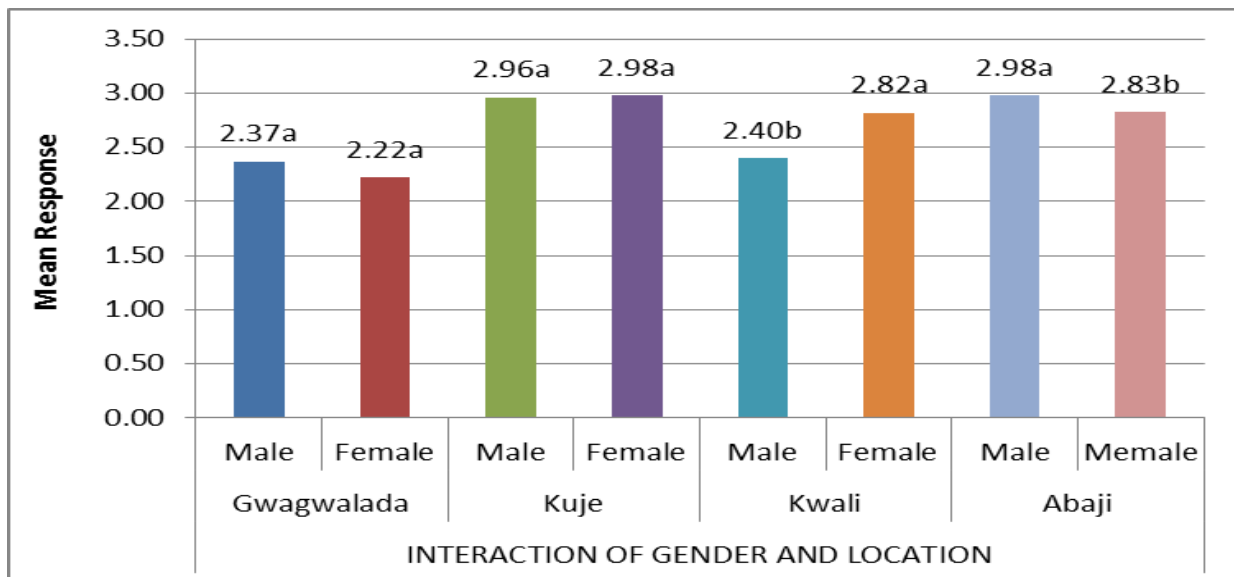


Fig 2: Gender use of GSM in agriculture in each Area Council

Note: Means with the same alphabet do not significantly differ from each other

The result showing locational differences in the use of GSM phones is shown in row 3 of the ANOVA Table 1. Here, emphasis is not placed on gender but on each location hence the question is: Irrespective of gender, are there significant locational differences in farmers’ use of GSM phones. It tests the hypothesis which states that there are no significant locational differences in farmers’ use of GSM phones in agriculture ($\mu_{Kwali} = \mu_{Kuje} = \mu_{Gwagwalada} = \mu_{Abaji}$). The result, $(3, 372) = 23.33, p = 0.00$, showed that farmers’ use of GSM phones significantly ($p < .00$) differed in some of the locations sampled hence the null hypothesis was rejected. Mean

separation (Fig 3) showed that farmers in Kuje and Abaji Area Councils did not significantly differ ($p > .01$) from each other but they significantly used GSM phones more than farmers in Kwali and Gwagwalada Area Councils. Again, farmers in Kwali Area Council significantly used GSM phones more than those in Gwagwalada. The locational differences may be attributed to inadequate or lack of infrastructural facilities in some of the locations because Aina (2007) stated that the dissemination of agricultural information in Africa is affected by lack of basic infrastructure. To corroborate this, Enwelu, *et al.* (2014) also stated that inadequate infrastructure and ICT facilities were the major factors that influenced the effective utilization of ICT in agriculture in Enugu State, Nigeria.

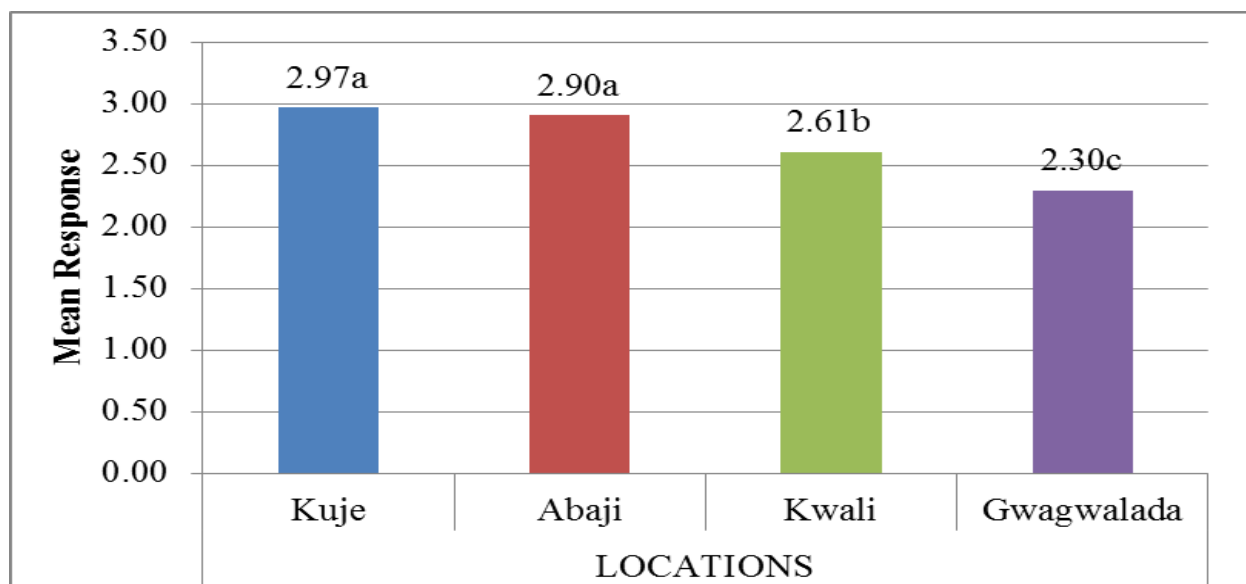


Fig 3: Locational differences in the use of GSM in agriculture (irrespective of gender)

Note: Means with the same alphabet do not significantly differ from each other

Table 2 shows some of the activities or tasks the farmers used GSM phones to do. The percentage distribution showed that the male and female farmers used GSM phones to carry out so many activities in agriculture but the extent of use differed from one activity to another. Generally, the female farmers relatively used GSM phones more than their male counterparts in getting information on market prices of goods and services, calling or receiving information from agricultural extension agents, getting information for meetings and communicating with other farmers within and outside their areas. These activities account for 56 percent of what the female farmers used GSM phones to do against 48 percent for the male farmers. This agrees with the findings of Hafkin and Huyer (2007) which indicated that women in West African countries

tended to use internet and cell phones more for personal and social issues while men use them more for professional or work-related activities. Comparatively, the percentage distribution suggests that both the male and female farmers used GSM phones mostly for communication.

Table 2: Farm activities carried out by gender using GSM phones

Agricultural activities	Male		Female	
	Freq	%	Freq	%
Get information on market prices of goods and services	20	10	22	12
Call or receive information from agricultural extension agents	20	10	21	11
Get information to attend meetings (e.g cooperative meetings)	18	9	20	11
Call customers to come and buy goods or services (advert)	19	10	20	11
Check time and date of the day with my phone	19	10	17	9
I use my phone to do calculations (i. e. simple calculation on farm business)	18	9	16	9
Communicate with farmers within or outside your area in order to solve agricultural related problems	17	9	20	11
Negotiate for labourers to work for me in the farm	15	8	16	9
I use my phone's alarm facility to wake myself up early to go to farm sometimes	14	7	8	4
Send or receive information on weather or climatic conditions	11	6	9	5
Browse the internet to get information on agricultural activities	9	5	5	3
Store information on agricultural production activities	9	5	7	4
Transfer money for the purchase or payment for an agricultural goods and services	6	3	4	2
Total	195	100	185	100

Table 3 shows the constraints to the use of GSM phones. About 32.82 percent of the male farmers indicated that one of the most limiting factors to their use of GSM phones is that it is easily stolen by criminals against 19.50 percent response from the female farmers. This suggests that women generally are more careful than men in handling GSM phones. Women keep their GSM phones in their hand or waist bags while most men keep theirs in their pockets. About

23.07 percent of the male farmers said it was expensive to maintain while only 4.85 percent of the female farmers reported so. This is in line with the apriori expectation because most women in rural societies rely on their husbands to demonstrate their love by buying for them items like GSM phones, clothes, shoes, wrist watches, etc. The implication of this is that they do not directly feel the cost of procuring some of these items. On the other hand, about 24.86 percent of the female farmers indicated that their major constraint to the use of GSM phones was poor network coverage or service especially in their farming environment while 12.33 percent of the men admitted so. In this analysis, the percentage differences in the factors influencing gender use of GSM phones were not subjected to inferential statistics hence it is not possible to state if the factors significantly differed or not. However, without further discussion, the percentage responses showed that the male and female farmers were affected by the same constraints but the degree at which the factors limited their use of GSM phones relatively differed by gender.

Table 3: Constraints to the use of GSM phones by the farmers

Constraints to the use of GSM phones	Males		Female	
	Freq	%	Freq	%
It is easily stolen	64	32.82	36	19.50
It is costly to buy a new and original phone	45	23.07	9	4.85
I donot know how to use some of the facilities in the GSM phone	37	18.96	29	15.67
Poor service especially when I go to farm to work	24	12.33	46	24.86
Problem of power to recharge the battery when it runs down	15	7.69	40	21.62
It is expensive to maintain (i.e. recharging when credit finishes)	10	5.13	25	13.50
Total	195	100	185	100

CONCLUSIONS

GSM phones are some of the technologies that have impacted positively on the output and productivity of famers in Nigeria. It has proved to be an effective tool in rural and agricultural transformation. It is one of the information communication technologies with a high rate of adoption and diffusion. Since studies have shown that there are differences in gender roles in

agriculture, there was need to verify if male and female farmers significantly differed in their use of GSM phones. The result indicated that both the male and female farmers used GSM phones to carry out so many agricultural related activities. The mean responses showed that there was no significant difference in gender use of GSM phones in the study area. In other words, there was no strong evidence to conclude that male and female farmers differed in their use of GSM phones. This suggests that the use of GSM phones is not gender sensitive but rather gender friendly. Irrespective of gender, there were locational differences in the farmers' use of GSM phones but this cannot be attributed to gender. The locational differences could be as a result of poor network or infrastructure because some of the rural communities did not have adequate GSM network coverage. For accelerated rural development, what is needed by agricultural extension and rural development agents is to network the farmers using GSM phones. Again, GSM phones should be given preference in the choice of communication technologies in rural communities.

REFERENCES

- Adeleke, A. & Aminu, S. A. (2012). The Determinants of Customer Loyalty in Nigeria GSM Market. *International Journal of Business and Social Science*, 3(14):209-222.
- Ademola, G., James, O. O. & Kehinde, O. (2013). The Introduction of GSM Services in Anyigba Community and its Impact on Students Expenditure Pattern. *Global Journal of Management and Business Research*, 13(8): 72-81.
- Afolabi, M. M. (2008). Women as Pillars of National Economy in Nigeria. A study of Economic activities of rural women in six Local Government Areas of Ondo State. International Association for Feminist Economics (IAFFE), Torino, Italy, 19th June – 21st July, 2008.
- Ajah, J. (2015). Comparative analysis of cooperative and non-cooperative farmers' access to farm inputs in Abuja, Nigeria. *European Journal of Sustainable Development*, 4(1):39-50.
- Ajah, J.; Unamma R. A. P. & Nwachukwu, I. (2011). Perception of Women Farmers' Levels of Involvement in Agricultural Production Activities in Southeast Nigerian, *Journal of Applied Agricultural Research* (3):57-63.

- Aina, L. O. (2007). Globalization and Small-scale Farming in Africa: What role for Information Centres. In World Library and Information Congress: 73rd IFLA General Conference and Council 19–23 August 2007, Durban, South Africa,
- Blackden, C. M., & Wodon, Q. (Eds.). (2006). Gender, Time Use, and Poverty in Sub-Saharan Africa (Working Paper 73). Washington, DC: World Bank.
- Dauda S, Anonguku I&Kpamor, M.A. (2009). Problems Associated with use of Modern Information Communication Technologies (ICT) for extension service delivery in Makurdi local Government Area. Proceedings of the 43rd Annual Conference of the Agricultural Society of Nigeria held in Abuja, 2009.
- Enwelu, I. A., Uramah, K. O., Asadu, A. N., & Chah, J. (2014). Assessment of ICT Utilization in Agriculture across-gender in Enugu-Ezike Agricultural Zone of Enugu State, Nigeria. *Journal of Agricultural Extension*, 18(2), 76-87.
- FAO (2011). The State of Food and Agriculture, Food and Agriculture Organization of the United Nations Rome, pp. 1-160.
- Field, A. (2005). *Discovering Statistics Using SPSS*. Second ed. Sage Publications, London, pp. 427-482.
- Gender and ICT Network. (2006). *The Gender Digital Divide in Francophone Africa: A harsh Reality*. Retrieved August 2, 2016, from: http://www.genderit.org/upload/ad6d215b74e2a8613f0cf5416c9f3865/africa_gender_divide.pdf
- Hafkin, N. J., & Huyer, S. (2007). Women and Gender in ICT Statistics and Indicators for Development. *Information Technologies & International Development*, 4(2): 25-41.
- Kurtenbach, T., & Thompson, S. (1999). Information Technology Adoption: Implications for Agriculture. In: *Conference for World Food and Agribusiness Forum*.
- Mehra, R. & Rojas, M. H. (2008). A Significant Shift: Women, Food Security and Agriculture in a Global Marketplace. International Center for Research on Women (ICWR).
- Okeke, C. I. (2014). Major factors Influencing the choice of GSM Networks among Oil and Gas Workers in Port Harcourt , Nigeria, *International Journal of Emerging Knowledge*, 2(1): 8 - 22.

- Olatokun, W. M. (2009). Analyzing socio-demographic differences in access and use of ICTs in Nigeria using the Capability Approach. *Issues in Informing Science and Information Technology*, 6, 479-496.
- Rees, H., & Noyes, J. M. (2007). Mobile Telephones, Computers, and the Internet: Sex differences in Adolescents' use and Attitudes. *CyberPsychology and Behavior*, 10, 482–484.
- Robert, A.Y. (2011). Mixed Analysis of Variance Models with SPSS. Statistics, Social Sciences and Mapping Group. Information Technology Services/Academic Computing Services www.myu.edu/its/soc.sci/Docs/spssmixed.ppt for Robert
- Shah, D. A. & Madden L. V. (2004). Nonparametric Analysis of Ordinal Data in Designed Factorial Experiments. *Phytopathology*. 94(1):33-43.
- Society, P. A. (2010). Communication Habits by Demographics: Gender, [Available Online at: <http://www.pas.org.pk/communication-habits-by-demographics-gender/>]
- World Bank, (1995). Development in Practice towards Gender Equality: The Role of Public Policy, World Bank.
- World Bank, (2003). Nigeria: Women in Agriculture. In: Sharing Experiences. The World Bank Group Participating Sourcebook, Washington D.C.