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Mobile Phone as an Extension Tool among Female Agricultural Practitionersin Lagos State Nigeria

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Abstract

This study assessed the use of mobile telephone for extension among female agricultural practitioners in Lagos State. The study adopted purposive selection of Epe and Ikorodu Local Government Areas (LGA), while simple random sampling technique was used to select 60 female farmers and 5 female EAs in each of the two LGAs. Data was analyzed with descriptive statistics and chi square. Results showed that female agricultural practitioners in Lagos State cut across different age groups, changing trend of farming business as youths and the younger generation now take active part. The majority (97.69%) of the respondents owned and used mobile phone for accessing market information among others. Also, 90.8% respondents agreed that it's an efficient and effective facility for extension communication. High cost of subscription, mobile phone and accessories were the major constraints reported. This study provided evidence on the role of mobile phones in reducing information search costs and asymmetries and increasing market efficiencies. It is recommended that an agricultural extension service incorporates/strengthens use of mobile phones for information dissemination by training EAs on opportunities inherent in the use of mobile phones.

Keywords: Female agricultural practitioners, mobile phones, extension tools

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Introduction

Extension and advisory services play a critical role in facilitating linkages with farmer-based organizations and other relevant actors, such as, government agencies, private sector and non-governmental organizations (NGOs), research institutes and education centers. Agricultural extension and advisory services can be defined as systems and mechanisms designed to build and strengthen the capacity of rural farmers and other stakeholders (Mbo'o-Tchouawou and Colverson, 2014). Rural women are key players in rural livelihood and they perform multiple roles, such as breeding, production, and community development However, it is within their role as small-scale farmers that they are reliant on the provision of extension and advisory services and other basic services (such as education, health care, water and sanitation) to decrease domestic workloads (UNDP and UNIFEM, 2009). Ultimately, increasing the agricultural production and engaging in other income-generating activities which will no doubt improve the quality of their livelihoods, thus emphasizing the need for effective extension and advisory services (EAS). The delivery of these EAS is therefore essential to ensuring that the potentials of the rural population, particularly women are improved and also equally recognizing the women farmers as key stakeholders, having their needs met and socio-economic concerns properly addressed (UNDP and UNIFEM, 2009).

The paradigm shifts in agricultural extension from transfer of technology to demand driven approach has been accompanied by a plethora of redefinition of extension methods implemented through a variety of institutional arrangements involving state institutions, private sector agencies, farmers' organizations and farming communities. Sustainability, reaching different farmer categories (the resource poor farmers, the marginalized farmers, the women farmers etc.), providing a combination of technological and facilitation support and services of high quality and the need for methods that are participatory and involve farmers as clients, are some key concerns in the search for appropriate extension tools.

Information, knowledge and skills for sustainable agriculture can be delivered in a variety of ways; through verbal means - involving a trained facilitator, printed materials and information communication technologies (ICTs), including two way ICTs such as mobile phones and the internet and one way ICTs such as radio and video. Each method has advantages and disadvantages that must be considered within the context of the enabling environment and the target population. For example, the success of verbal, face-to-face extension methods depends largely on the availability of technically competent, formally educated trainers, criteria that may be difficult to meet in many rural communities in Africa. While radio has been successfully used to provide farmers with information (Farm Radio International, 2008), this medium may be less appropriate for improving skills and decision making capacity.

In many rural communities however, access to adequate knowledge, improved technology, financial services and other relevant social services (e.g. potable water, education and health services) remain a critical issue. There are still significant challenges in providing extension and advisory services in these areas. This range from insufficient funds for supporting public extension, poor resource, disorganized

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structures resulting in poor infrastructure for attracting businesses, limited involvement of rural farmers and populations in extension processes to the lack of appropriate strategies for effective research and adequate extension methods. Limited coverage of extension services across rural areas and challenges in adapting technology packages to community-specific contexts have also been highlighted as critical issues in the delivery of extension and advisory services (IFPRI–World Bank, 2010).

In addition to the above mentioned challenges, it has also been documented that delivery of extension and advisory services has not equally benefited men and women farmers in rural areas. A recent study in India, Ghana and Ethiopia revealed important gender gaps in access to agricultural extension in these regions due mainly to the limited participation of female farmers in extension-related meetings and the lack of incentives for reaching these female farmers (IFPRI–World Bank 2010). Other studies have also stressed that extension and advisory services provision in the agricultural sector has been more often biased against women farmers as they often lack access and control over productive resources and technologies that are affordable and appropriate to their needs (Quisumbing and Pandolfelli, 2009; Swanson and Rajalahti, 2010). Moreover, very few strategies and good practices have been implemented, and the policy debate on extension and advisory services delivery has not fully concentrated on addressing rural population needs from a gender perspective. To overcome these challenges, there have been reforms in the existing extension and advisory services systems and an array of innovative practices developed to continuously empower rural populations, with an attempt in ensuring that women and disadvantaged groups can fully benefit from this package.

Though several initiatives are currently underway to improve rural extension and advisory services delivery with a focus on gender equity and social inclusion, only few such as Women-In-Agriculture (WIA) programmes in the department of Extension Services of the State ADPs in Nigeria are documented (Odurukwe, Matthews-Njoku and Ejiogu-Okereke, 2006). Such information is, however, critical to assess the efficiency, effectiveness and performance of various extension and advisory services approaches in order to strengthen extension and advisory services methods that improve rural livelihoods. Among such strategies is the use of mobile phones (which has become pervasive) in providing extension and advisory services.

Mobile phone provides new ways through which extension workers can reach farmers in rural areas that have in the past been very difficult to contact, particularly in developing countries like Nigeria. Ownership and use of mobile phone among the rural farmers has continued to increase thereby increasing the chances of contacting farmers in their communities for extension activities. The unprecedented speed of adoption of mobile phone technology has raised the general expectations about its potential contributions to spread of innovative farming technology, as well as farmers' knowledge and awareness of other relevant knowledge and information.

Although "agriculture remains a key component of Nigeria's economy, and currently contributes about 35 percent of the gross domestic product (GDP) and employs a large number of the active population, the sector has however, significantly underperformed its potential" (FGN, 2008).Globally, traditional agricultural extension systems are said to be in decline, while the number of farmers is said to have increased and stood at around 2.6 million, the number of extension workers is to

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have decreased to approximately 500,000 (Gakuru, Winters and Stepman 2009; Anderson & Fedder, 2007; Aker, 2011), therefore the ratio of Extension worker to farmer in the Nigeria is1:3000, but Onwuemeka,(2016) stated that this ratio of extension agent to farmer is as low as 1:10000. The involvement of women in agriculture has attracted greater attention in recent years. The need to develop a suitable extension service that is gender specific and tailored to women farmers cannot be overemphasized. This is in recognition that women play very significant roles in Nigeria agricultural production, processing and utilization (Nnadozie and Ibe 2000), but are constrained under the unified Extension System by socio-cultural, trado-religious and economic barriers, and by the current approach, women farmers rely almost exclusively on a network of contact farmers that are over 95% male farmers.

The Report of the Agricultural Extension Transformation Agenda provided a clear road map to address the critical challenges of agricultural extension and advisory services to transform it into a participatory, demand-response, market-oriented and ICT-driven service that will provide for all the extension needs of all actors along the targeted commodity value chains of interest. The Federal Government of Nigeria implemented the Growth Enhancement Support Scheme (GESS) as a component of Agricultural Transformation Agenda (ATA). The scheme which aimed at subsidizing the cost of major agricultural inputs like fertilizer and seedlings, registered about 14 million farmers throughout the country for direct redemption of farm inputs through the e-wallet system (communicating with rural farmers via mobile phones, precisely SMS). This highlights the importance of mobile phone in the Agricultural Transformation Agenda and especially in agricultural communication and extension.

Purpose of the Study

The study assessed the use of mobile telephone as an extension tool among female agricultural practitioners in Lagos state, Nigeria, with the following specific objectives were to:

1. describe the characteristics of the female agricultural practitioners in Lagos State;
2. examine the level of accessibility of respondents to means of telecommunications services in Lagos State;
3. examine the effectiveness of mobile phone as a tool/medium of agricultural extension information for female agricultural practitioners;
4. identify the factors affecting the use of the mobile phone technology by respondents; and
5. examine the constraints encountered by respondents in the use of mobile phone for agricultural communication.

Hypothesis

H_o: There is no significant relationship between the use of mobile phones in as an extension tool and female agricultural practitioners' productivity in Lagos State, Nigeria.

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Methodology

This study was conducted in Lagos state. It has a land mass of about 3,577 Km^2 with about 787 $Km^2$of theses consisting of lagoons, swamps, marches and creeks. It is the smallest state; however, it has the highest population density in the nation. According to the 2006 census, the state is the second most populous state in the Federation. Lagos State borders Ogun State to the North and East and the Republic of Benin to the West. The Atlantic Ocean formed the southern border and stretches for about 180 Km. The state is one of the littoral states in Nigeria.

The population for this study includes all the female extension agents in Lagos State and all practicing female farmers in Lagos State (covering female crop farmers, female livestock farmers, as well as processors and agro-allied/agro-business owners). This choice was made with respect to the objective of the study and these people were interviewed for data collection. The sample comprised of female agricultural practitioners who are the users of the mobile phone technology as well as female extension agents from the public extension organization the Lagos State Agricultural Development Authority (LSADA). Purposive sampling technique was used in identifying female agricultural practitioners with mobile telephony knowledge. Also, two local governments; Epe and Ikorodu were purposively selected because they have high level of agricultural activities. However, 60 practicing female farmers in each of the two local government areas were randomly selected to give a total of one hundred and twenty (120) female farmers as sample size. Also, ten (10) female extension agents were randomly selected from a list of female extension agents in LSADA.

Structured questionnaire was used to gather quantitative data from the study sample. The questionnaire was divided into two parts. Part one contained items of personal characteristics while, part two contained general information items relating to the study.

Data were analyzed with descriptive tools on Statistical Product and Service Solution (SPSS, version 21) using charts, frequency distribution tables and percentages.Mean score was also obtained from 5-point Likert scale of very effective (5), effective (4), undecided (3), ineffective (2) and highly ineffective (1) to elicit data from the respondents. Stated hypothesis was analyzed using chi-square (X^2).

Results and Discussion

Socio-economic Characteristics of Female Agricultural Practitioners in Lagos State

Table 1 shows the characteristics of the respondents. The age distribution revealed that 24.6% of respondents were 20 – 30 years, 30% were within 31 – 40 years of age, and 19.2% are within 41 and 50 years old, while the aged, that is, 51 years and above 22.3%. This explains that female agricultural practitioners in Lagos State cut across all age groups. Also, more than average are in their active age, they have 'functional capacity'to use mobile phones for their farm productivity and this is confirmed by Omoregbee and Ighoro (2012) that the trend of farming business is changing as youths and the younger generations are beginning to take part in the venture, and this is confirmed to influence their choice to adopt mobile phone. Findings on their marital status show that 75.4% were married and 24.6% were

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single. This shows that female agricultural practitioners in Lagos State were mostly married. This indicates that marriage is not a barrier to application of technology. This is in line with Gbadebo (2012), who concluded that marriage is one quality that is held of prominent among rural farming households.

The income classification revealed that the 33.1% of the respondents had monthly income range between N60, 001 and N75, 000. Also, 32.3% had an average monthly income between N45, 001 and N60, 000, while 9.2% had monthly income ranging from N30, 001 and N45, 000. Though, 23.1% reported to have more than N75, 000 as the monthly income. The average income among the respondents was N52, 500. This has implication for utilization of mobile phone as a tool for extension service delivery by the female extension workers. This result is supported by Di-Maggio and Cohen (2003) who explained the positive correlation between the level of income and timing of adoption of new technology. Result on educational status revealed that 46.9% of the respondents are educated having possessed tertiary education qualification in form of first degree and post graduate qualifications. Only 5.4% had non-formal education. The level of education and income according to Bolarinwa and Oyeyinka (2011) are closely related; the more educated a person is, the greater the likelihood of a high income. Also, more educated people are better able to learn and use new technology and hence they are more likely to be innovative and adopt mobile phone technology in their agricultural operations.

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Table 1: Socio-economic characteristics of respondents

Variables	Percentage (%) (n=130)
Age (years)	
20-30	24.6
31-40	30.0
41-50	23.1
51 & above	22.3
Educational status	
Non formal education	5.4
Primary education	13.8
Secondary education	29.2
Tertiary education	46.9
Adult education	4.6
Marital status	
Single	24.6
Married	75.4
Agriculture as primary occupation	
Yes	67.7
No	32.93
Other occupation	
Artisans	41.7
Fishing	12.5
Civil servants	8.3
Students	2.1
Teaching	10.4
Agricultural enterprise	
Poultry farming	19.6
Livestock farming	15.9
Crop production/plantation farming	27.1
Fish farming	33.6
Marketing of raw food products	2.8
Processing of agricultural produce	4.6
Years of experience in agricultural enterprise	
15 years	43.1
6-10 years	28.5
11-15 years	9.2
16 years & above	1.5
No response	17.7
Ownership structure of business	
Sole proprietorship	60.8
Partnership	34.6
Limited liability company	3.2
Others (cooperatives)	3.9
Average monthly income	
₦15, 000 – 30, 000	2.3
₦30, 001 – 35, 000	9.2
₦35, 001 – 60, 000	32.3
₦60, 001 – 75, 000	33.1
Above ₦75, 000	23.1

Source: Field Survey, 2016

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Accessibility of Female Agricultural Practitioners to Mobile Phones in Lagos State

Figure 1 indicates that the majority (98%) of the respondents owned mobile phone. An increasing need for new and different types of information on agriculture, literacy level, experience in agriculture and farming being the major occupation could be the likelihood of the female agricultural practitioners owing mobile phones.

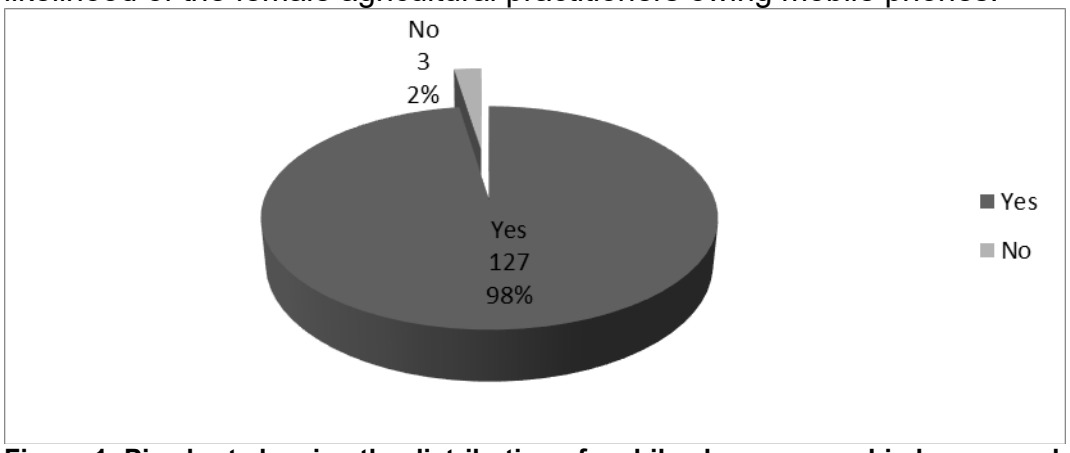

Figure 1: Pie chart showing the distribution of mobile phone ownership by respondents
Source: Field Survey, 2016

Figure 2 shows that the majority 82.3% of respondents used mobile more frequently. This is an indication that there is a relationship between mobile phone ownership and usage. By implication, female agricultural practitioners tend to have and use mobile phones for several purposes.

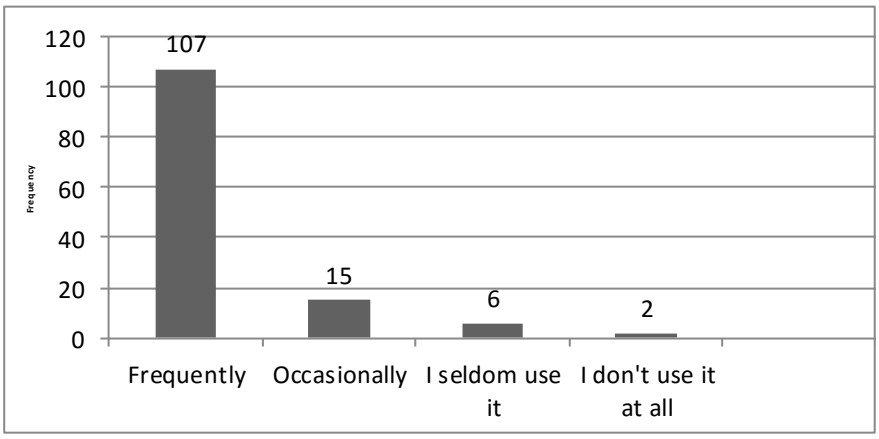

Figure 2: Frequency of mobile usage by female agricultural practitioners in Lagos State
Source: Field Survey, 2016

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Respondents' Use of Mobile Phones for Agricultural Purposes

Table 2 shows that the following proportion of the female agricultural practitioners who owned mobile phone used it to initiate and receive calls/source information on, accessing more profitable markets (59.5%), inputs procurement (54.5%,), emergency help (48.8%), consulting experts (53.4%), and monitoring financial transactions(65.2%) respectively. This is a good development since it portrayed the significance of mobile phone in agriculture. The result is in line with the findings of Aker, (2008) and Okello (2011), which indicated that farmers/traders of agricultural produce (grains) who gained access to mobile phone use it to seek market information. However, the result shows that not more than 13.2% of the respondents used text message, mobile phone tool to get access to inputs. This is a great challenge to ATA e-wallet fertilizer allocation to farmers. As such, much needs to be done to develop agricultural practitioners' capacity to effectively use mobile phone.

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Table 2: Distribution of respondents' use of mobile phones for agricultural purposes

Source of information	Percentage (%) n = 130
Means of market access	
Call	59.5
Text	15.2
Call and text	22.4
Non usage of phone	1.7
Input sourcing	
Call	54.5
Text	13.2
Call and text	27.3
Non usage of phone	5.0
Emergency/assistance	
Call	48.8
Text	6.6
Call and text	33.1
Non usage of phone	11.6
Expert consultation	
Call	53.4
Text	17.5
Call and text	21.7
Non usage of phone	7.5
Financial transactions	
Call	65.2
Text	11.2
Call and text	20.2
Non usage of phone	5.0

Source: Field Survey, 2016

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Perceived Effectiveness of Use of Mobile Phone by Female Agricultural Practitioners

The female agricultural practitioners were requested to express their perception of the use of mobile phone as a tool to aiding their agricultural activities using 5-point ranking of statement for the activities on Likert-scale of very effective (5), effective (4), undecided (3), ineffective (2) and highly ineffective (1). Table 3 shows the female agricultural practitioners' perception of the use of mobile phone as a tool for aiding their agricultural endeavours was rated as effective. This result is consistent with the findings of Gaurall, (2009) and Furuholt & Matotay (2011) in which they found that the use of mobile phone enables farmers to access information from various sources such as research institutes, inputs dealers, government agencies, agricultural extension workers, traders and even consumers of their products. They affirmed that mobile phones affected all stages of the farming cycle from land clearing to product processing and disposal. This result is also supported by the findings of Hudson, (2006) who reported use of mobile phone as not only being adopted for social reasons, but also as a tool that allows for more efficient and informed decisions and action to improve output.

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Table 3: Perceived effectiveness of mobile phone usage for extension information sourcing

Quality of information	Mean (μ)
Procurement of Inputs	3.60*
Sourcing of credit for agricultural business	3.31*
Marketing of agricultural produce/Market information or negotiation	3.23*
Pest and diseases management	2.98
Storage and processing	2.98
Utilization of farm produce	2.97
Farm operations	3.06*
Weather information – forecast, trends, rainfall, etc.	3.06*
Lobbying for more resources including new cropping, livestock, or production alternatives	3.01*

Source: Field Survey, 2015

Constraints Encountered by Respondents in the Use of Mobile Phone

Table 4 shows that, poor network was ranked poor as the most significant constraint affecting the use of mobile phone as an extension tool among female agricultural practitioners. Ranked next to poor network were epileptic electricity (μ= 3.75), high cost of subscriber charges (μ = 3.31), poor quality of mobile phone and its accessories (mean = 3.19), inadequate skill for its operation (μ = 3.15), and high cost of maintenance (μ = 3.14). These results are in consonance with that of Bolarinwa and Oyeyinka (2011), Anthony (2007) which identified high call tariff, fluctuating service, erratic power supply, high cost of handset, cost of recharge cards, network coverage, repair of technical fault and access to recharge purchasing centers as constraints to effective use of cell phone in Nigeria. By implication, female farmers are limited to use mobile phones for agricultural purposes as these constraints discourages the use and adoption to obtain information regarding their business and for daily transactions.

Table 4: Constraints to effective usage of mobile phone by female agricultural practitioners

Constraints	Weighted Mean	Std. Dev.	Remarks
Poor network	4.03*	0.915	1st
Electricity problem	3.74*	0.915	2nd
High cost of subscriber charges	3.31*	0.797	3rd
Poor quality of mobile phone and its accessories	3.19*	0.779	4th
Inadequate skill for its operation	3.15*	0.748	5th
High cost of maintenance	3.14*	0.966	6th

Source: Field Survey, 2015

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Conclusion and Recommendations

Respondents perceived mobile phone as an effective means of sourcing information regarding extension service delivery to farmers. High cost of subscription, Poor quality of mobile phone and its accessories and electricity problems were the top ranked constraints against effective usage of mobile phone among farmers in the study area.

Continuous training should be organized by the extension agencies for extension agents and in turn farmers on opportunities that abound in the use of mobile phones for extension services delivery.

References

Aker, J.C (2011): Dial "A" for Agriculture: a review of information and communication technologies for agricultural extension in developing countries. *Agricultural Economics* 42: 631-647. Doi:10.111/j.1574-0862.2011.00545.x

Aker, J.C (2008): Does digital divide or provide: The impact of cell phones on grain markets in Niger. BREAD Working Paper No.177

Anderson, J. and G. Fedder (2007): *Handbook of Agricultural Economics*, Vol. 3. Everson R.E.& Pinyali, P. (eds). Elsevier Science, Amsterdam, The Netherlands 2343-2378.

Anthony, O.A., (2007): *Agricultural Extension A Pathway for Sustainable Agricultural Development*, Loud Books/Apani Publication.

Bolarinwa, K.K. and R.A. Oyeyinka (2011): Use of cell phone by farmers and its implication on farmers' production capacity in Oyo State Nigeria. In: *World Academy of Science, Engineering and Technology* 51

FGN (2009) Nigeria: Vision 20:2020. The First National Implementation for NV20:2020 (2010 – 2013). Volume 1: *The Vision and Development Priorities* (The Economic Transformation Blueprint), National Planning Commission, Abuja.

Furuholt, B., & Matotay, E. (2011): The developmental contribution from mobile phones across the agricultural value chain in rural Africa. *The Electronic Journal on Information Systems in Developing Countries,* 48 (7): 1–16.

Gakuru, M., K. Winters and F. Stepman, (2009): Inventory of Innovative Farmers advisory services using ICTs. Forum for Agricultural research Africa (FARA), Accra, Ghana

Hudson, H. (2006): *From rural village to global village: Telecommunications for development in the information age.* Danbury, CT: Lawrence Erlbaum.

International Food Policy Research Institute (IFPRI)–World Bank. (2010): *Gender and governance in rural services: Insights from India, Ghana, and Ethiopia. Agriculture and Rural Development*. Washington, DC, USA: The World Bank.

Mbo'o-Tchouawou, M and K. Colverson (2014): *Increasing access to agricultural extension and advisory services: How effective are new approaches in reaching women farmers in rural areas*? International Livestock Research Institute (ILRI)

Nnadozie, B. and I. Ibe (2000): Women in agriculture: Problems and prospects. In: Nwosu A C, Nwajiuba C U and Mbanasor J A (editors); *Agricultural*

Transformation in Nigeria. Novelty Industrial Enterprises. Owerri, Imo State, Nigeria.

Odurukwe S. N., E. C. Matthews-Njoku and N. Ejiogu-Okereke (2006): Impacts of the women-in-agriculture (WIA) extension programme on women's lives; implications for subsistence agricultural production of women in Imo State, Nigeria. *Livestock Research for Rural Development. Volume 18, Article #18.*

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Retrieved April 18, 2016, from http://www.lrrd.org/lrrd18/2/odur18018.htm *and Nigeria Experiences.* CTA (ACP-EU), Wageningen, The Netherlands.

Okello J.J. (2011): Use of information and communication tools and services by rural grain traders: The case of Kenyan maize traders. *Intern. J. ICT. Res. Dev*., 2: 39-53.

Onwuemene A. (2016): Proposed roadmap for agricultural extension and advisory services delivery. Proceedings, 21st Annual National Conference of the Agricultural Extension Society of Nigeria, held at the University of Ibadan, Ibadan, 16th – 21st April, 1-6

Quisumbing, A.R. and L. Pandolfelli (2010): Promising approaches to address the needs of poor female farmers: Resources, constraints, and interventions, *World Development* 38(4):581–592.

Swanson, B. and R. Rajalahti (2010): Strengthening agricultural extension and advisory systems: Procedures for assessing, transforming, and evaluating extension systems. Agriculture and Rural Development Discussion Paper 44.ARD, Washington, DC, USA: World Bank.

United Nations Development Programme- United Nations Development Fund for Women (UNDP–UNIFEM). (2009): A user's guide to measuring gender-sensitive basic service delivery. UNDP, Oslo Governance Centre, Norway: L. Corner and S. Repucci (eds).