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## **Awareness and Use of E-Resources Among Public Extension Personnel in Anambra State, Nigeria**

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### **Abstract**

*The study assessed the awareness and use of e-resources among public extension personnel in the area. Stratified sampling technique was used in selecting respondents from each cadre of the Anambra State Agricultural Development Programme (ASADEP). A total of sixty-nine (69) agricultural extension staff was used for the study. Findings show the major e-resource tool that was available to the majority (94.2%) of extension staff in the area was mobile phone, while 62.3% indicated that computer was available to them. The majority (69.6%) of the respondents were each aware of Facebook, and email, while 56.5% were aware of twitter. Among those who were aware of email, the majority (59.4%) indicated they used it while 43.5% of those that were aware of Facebook indicated they used it. Results show that 15.9% of the respondents indicated they used e-journal in exchanging information on pests and diseases, 10.1% exchanged weather and climate information on e-mail, while 11.6% each indicated they used email to exchange information on farm inputs and market prices. On the other hand, 10.1% each used e-journal and e-mail to exchange information on processing methods. The study concluded by drawing attention to the very low adoption of e-resources in extension service delivery in the area. Efforts should be made by both federal and state governments to provide enabling technological environment and training opportunities for extension personnel in order to improve e-extension which is a veritable alternative towards solving the issues of dearth in extension staff that has been a persistent problem plaguing extension service in the country.*

**Keywords:** Agricultural extension, e-resources utilisation, Information and Communication Technology, Anambra State

## **Introduction**

Agricultural extension service delivery is rapidly changing with the current global advancements in Information and Communication Technology (ICT). This advancement in ICT is ushering in new opportunities for African farmers to improve their knowledge and livelihoods (Asongu, 2015; Demombynes and Thegeya, 2012). According to Mansour (2013), the application of ICT (computer and Internet) in agricultural extension programs, and delivery of agricultural information to users, and on the internet network has led to the emergence of the electronic agricultural extension (e-extension).

Electronic resources (e-resources) refer to those materials that require computer access (ICT devices), whether a personal computer, mainframe or handheld mobile device (Sharon, Ole, Julia et al., 2012), and may either be accessed remotely (network) or directly (local). According to Library of Congress (2016), direct access to electronic resources refers to the use of electronic resources via physical carriers (e.g., discs/disks, cassettes, cartridges) designed to be inserted into a computerized device or its auxiliary equipment. However, for remote access, no physical carrier can be handled. It is provided with the use of an input-output device (such as a terminal), connected to a computer (like resource network), some of which include; e-journal, e-books, databases, reference databases (biographies, directories, encyclopaedia), e-images, e-audio/visual resources etc. E-resources also include; internet, internet databases, electronic products, virtual libraries, clickable collections; internet resources etc. According to Dhanavandan and Tamizhchelvan (2012), e-resources requires computer access or any electronic product that delivers a collection of data, be it text, referring to full-text bases, electronic journals, image collections, other multi-media products and numerical, graphical or time based as a commercially available title that has been published with an aim to be marketed. For users, E-resource has the advantages of time and place convenience, ability to search directly on text, ability to link to further reading material and ability to disseminate and share information (Quadri, 2012)

According to Gichamba, Wagacha and Ochieng (2017), E-agricultural extension is an extension system that enables extension officers to reach out to farmers using a more efficient alternatives to a traditional system of agriculture using platforms like SMS, Interactive Voice Response (IVR), downloadable applications, Unstructured Supplementary Service Data (USSD) and mobile web and most services would be duplicated across different technologies in order to accommodate a larger clientele given the wide array of mobile devices among the target users. This helps to increase productivity, profitability and global competitiveness

According to Mtega et. al. (2014), agricultural extension staff can use e-resources to forward practical problems to research institutes and use the same tools to access information from different sources including research institutes. E-resources can also be easily accessed and used, making it possible for agricultural stakeholders to make rational decisions. However, making effective use of ICTs is a complex process that requires comprehensive solution built on detailed information which can be provided by e-readiness assessment (Adedeji, 2017). A successful application of ICTs requires improved awareness among development actors such as extension workers, and greater capabilities among development organizations including extension, education and research organizations (Raksha, Rao, Meera and Kumar, 2015).

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### **Purpose of the study**

The study ascertained the awareness and use of e-resources by public extension staff in Anambra State of Nigeria. The specific objectives that guided the study were to:

- ascertain the ICT tools available to extension staff;
- ascertain the use of e-resources among respondents;
- ascertain types of information exchanged through different e-resources;
- identify constraints to effective utilization of e-resources; and
- identify strategies for improved utilization of e-resources among extension workers.

### **Methodology**

The study was carried out in Anambra State, Nigeria. All public extension (Agricultural Development Programme (ASADEP)) staff in the State constituted population for the study. Stratified sampling technique was adopted to select four (4) zonal managers, four (4) zonal extension officers, seven (7) subject matter specialists, fifteen (15) block extension supervisors, six (6) Block Extension Agents, and thirty-three (33) extension agents giving a total of sixty-nine (69) respondents used for the study. The sixty-nine (69) respondents sampled were the total population as a result disproportional and small size of extension personnel in the study area. Most blocks had incomplete block extension agents (BEA) and block extension supervisor (BES) while at the cell level, the extension agents were too small in number that most of them had to play a dual role of BEA and EA or BES and EA at the same time, and sometimes EAs can cover numerous cells beyond their designation. Hence, the sampling technique was specifically chosen to suit the prevailing situation, for which a total number of 69 respondents were sampled from the population.

Data on availability of ICT tools was collected by asking respondents to tick from a list of ICT tools to indicate those that were available to them in carrying out their duties as agricultural extension staff. In order to obtain information on awareness and use of e-resources, respondents were presented with a list of e-resources and told to tick against which ones they were aware of and the ones they make use of in carrying out their activities. In order to examine the kinds of information respondents exchanged through e-resources, they were made to indicate which of the e-resources they used in exchanging specific agricultural information among themselves and other stakeholders. Respondents were also asked to rate the perceived constraints affecting their effective utilization of e-resources. This was measured on a three-point Likert-type scale with points of 0, 1 and 2, with a cut-off point of one (1). In order to identify possible strategies for improved utilization of e-resources among extension workers, respondents were asked to rate their perceived strategies on a three-point Likert-type scale of 1, 2, 3 with a cut-off point of two (2). Data for the study were collected using questionnaire. Data were analysed using descriptive statistics.

## **Results and Discussion**

### **Socio-Economic Characteristics of Extension Staff**

Table 1 shows that the majority of the respondents were male (52.2%), married (73.9%), with a mean age of 39.09 years, implying that the majority of the respondents were within the active/productive age which could enhance their use of innovations in extension service delivery including e-resources. Also, the majority (87.0%) had B.Sc/HND. as highest educational qualification. These results are consistent with that of Onwubuya, Nenna and

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Ugbaja (2015) that the majority of the extension workers were male, with a mean age of 39.8 years and had BSc/HND. Results show that the majority (85.4%) of the respondents had 1-24 years of job experience and this implies that they will be a better position to identify areas of their job that can be enhanced with ICT. Findings also show that the majority (60.9%) of the respondents received ₦50, 000 and less as monthly income, with an average monthly salary of ₦47, 100. The mean household size was 7 persons. This means that extension workers in the area had considerable large household size. The monthly salary may therefore not give enough incentive to the extension workers as this may not be enough to cater for their household in the light of the present economic situation of the country.

**Table 1: Socio-economic characteristics**

Socio-economic characteristics	Respondent (n = 69)	
	Percentages (%)	Mean(x)
<b>Sex</b>		
Male	52.2	
Female	47.8	
<b>Marital status</b>		
Single	24.6	
Married	73.9	
Divorced	-	
Widowed	1.4	
<b>Age</b>		
<30	29.0	
31 – 40	29.0	39.09
41– 50	34.8	
51 – 60	7.2	
<b>Educational level</b>		
Non-formal education	-	
Primary school attempted	-	
Primary school completed	-	
Secondary school attempted	-	
Secondary school completed	-	
OND/NCE	7.2	
BSc/HND	87.0	
MSc	5.8	
PhD	-	
<b>Job experience (years)</b>		
1 – 23	85.4	8.67
24 – 40	14.4	
<b>Monthly income (#)</b>		
<50,000	60.9	
51,000 – 92,000	17.4	47,100
93,000 –125,000	4.3	
<b>Household size</b>		
1 – 3	20.3	
4 – 6	59.4	7
7 – 9	20.3	

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### Availability of ICT Tools

Table 2 shows that the majority (94.2%) of the respondents indicated that mobile phone was available to them, while 62.3% indicated computer, 58% indicated radio, 52.2% indicated television and 44.9% each indicated that telephone and internet were available to them. The presence of ICT, like mobile phone, computer, helps to improve communication and dissemination of innovation among stakeholders in the agriculture innovation system. Report by Albert (2014) on constraints to effective use of ICT among extension professionals and farmers in extension delivery system in Rivers State, Nigeria, shows that the use of ICT such as the GSM phone helped to reduce or eliminate the deficiencies in services, especially when the extension worker uses his/her GSM phone to follow-up the farmer on the taught technology or send photographs of the technology to the farmer's phone.

**Table 2: Percentage distribution of respondents on availability of ICT tools**

ICT tools	Availability
	Percentage *(%)
Radio	58.0
Television	52.2
Telephone	44.9
Mobile phone	94.2
Computer	62.3
Internet	44.9
Video camera	21.7
Audio recorder/player	18.8
GPS	26.1
Remote sensing equipment	11.6
Audio visual aid	17.4

**(\*) Multiple responses**

### Awareness and Use of e-Resources

Table 3 shows the level of awareness of different e-resources among public extension personnel in the area. From the result, the majority (69.6% each) of the respondents were aware of email and Facebook respectively, while 56.5% were aware of twitter and 53.6% were aware of 2go. On the other hand, 49.3% of the respondents were aware of online databases, while 47.8% each were aware of e-library and U-tube, and 46.4%, 44.9%, 43.5% and 42.0% were aware of WhatsApp, E-journal, E-agriculture and E-radio respectively.

Table 3 also shows percentage distribution of respondents who use the various e-resources they were aware of. Among those who were aware of email, 59.4% percent indicated that they use it, while 43.5% indicated that they use Facebook, 39.1% use 2Go, 38.4% use E-journal, and 31.9% each use E-agriculture and WhatsApp. Also, among those who were aware of E-library, 31.8% use it, while 26.1% each use twitter and online data bases, 23.2% used U-tube, and 20.3% use e-radio. Generally, the results show low use of e-resources by the extension personnel. This could result from different factors including personal or attitudinal, infrastructural, capacity factors and so on. The finding contradicts that of Mtega, Dulle, Melakani and Chaila (2014) which showed that the majority of agricultural extension personnel and researchers used e-resources in Tanzania.



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**Table 3: Distribution of respondents on awareness and use of e-resources**

<b>E-resources</b>	<b>Aware*</b>	<b>Used*</b>
	<b>(%)</b>	<b>(%)</b>
E-radio	42.0 (29)	20.3 (29)
E-magazine	39.1 (27)	24.6 (27)
E-journal	44.9 (31)	34.8 (31)
E-library	47.8 (33)	31.8 (33)
E-mail	69.6 (48)	59.4 (48)
Online-databases	49.3(34)	26.1 (34)
Facebook	69.6(48)	43.5 (48)
U-tube	47.8 (33)	23.2 (33)
Twitter	56.5 (39)	26.1 (39)
E-agriculture	43.5 (30)	31.9 (30)
E-commerce	33.3 (23)	11.6 (23)
E-marketing	37.7 (26)	17.4 (26)
e-Video conferencing	37.7 (26)	18.8 (26)
Myspace	23.2 (16)	15.9 (16)
2go	53.6 (37)	31.9 (37)
WhatsApp	46.4 (32)	31.9 (32)

\*Multiple responses

NB: Figures in parentheses are frequency (n) of respondents that were aware of each e-resource

### Information Exchanged Using Various E-Resources

Table 4 shows percentage distribution of respondents according the kinds of agricultural information exchanged through the various e-resources. From the result, 15.9% of the respondents indicated that they use e-journal to exchange information on pests and diseases outbreak, while 15.5% and 11.6% indicated that they used e-mail and Facebook respectively and 10.1% each indicated that they used e-magazine and E-agriculture to exchange the same information. Also from the Table 4, 10.1% of the respondents indicated that they used e-mail to exchange weather and climate related information, while 8.7% used e-radio, 7.2% used Facebook, 5.8 used e-agriculture and 4.3% each used e-magazine, e-journal, 2go and WhatsApp to exchange the same information on weather and climate. Also from Table 3, 11.6% indicated that they used e-mail to exchange information on farm inputs, while 8.7% each used e-journal and e-agriculture platforms, and 4.3% each used e-library, online databases, and WhatsApp. On the other hand, 11.6% of the respondents indicated that they used email to exchange information on market prices of agricultural products, while 7.2% used Facebook, 5.7% and 4.3% used E-marketing and e-agriculture platforms to exchange the same information.

Also from the Table, 10.1% each indicated that they used e-journal, and e-mail to exchange information on processing method, while 7.2% used e-agriculture platforms, 5.8% used Facebook and 4.3% each used e-library and WhatsApp. The results show that very few of the extension personnel sought or exchanged information with stakeholders through most of the e-resources. It is obvious that little or nothing is happening yet in terms of e-extension service among respondents in the study area. The reason could be that they used e-resources more for personal interests. It could also result from lack of training or capacity development on how

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to incorporate its use in exchanging information. This implies that extension service delivery will be lagging in terms of up-to-date information as well as current innovations in technical transfer mechanisms.

**Table 4: Kind of information exchanged using different e-resources**

<b>Electronic resources</b>	<b>Pest and Diseases Outbreak</b>	<b>Weather or Climate</b>	<b>Info. On Farm input</b>	<b>Market Price</b>	<b>Processing Methods</b>
	(%)	(%)	(%)	(%)	(%)
e-radio	5.8	8.7	2.9	1.4	-
e-magazine	10.1	4.3	5.8	1.4	2.9
e-journal	15.9	4.3	8.7	2.9	10.1
e-library	7.2	1.4	4.3	-	4.3
e-mail	15.5	10.1	11.6	11.6	10.1
Online database	1.4	2.9	4.3	2.9	2.9
Facebook	11.6	7.2	2.9	7.2	5.8
You-tube	4.3	1.4	-	-	-
Twitter	4.3	2.9	1.4	2.9	1.4
e-agriculture	10.1	5.8	8.7	4.3	7.2
e-commerce	-	-	1.4	2.9	1.4
e-marketing	-	-	2.9	5.7	1.4
Video conferencing	2.9	-	-	-	-
MySpace	-	-	1.4	-	-
2go	1.4	4.3	1.4	-	1.4
Whatsapp	4.3	4.3	4.3	1.4	4.3

\*Multiple responses

### **Constraints to Utilization of E-Resources**

Table 5 shows the extent to which respondents perceived constraints to effective use of e-resources. From the Table, constraints include: lack of awareness of e-resources among extension staff ( $\bar{x}$ =1.36), complexity in usage of e-resources ( $\bar{x}$ =1.07), unavailability of e-resources ( $\bar{x}$ =1.32), lack of internet connectivity ( $\bar{x}$ =1.28), high cost of internet access ( $\bar{x}$ =1.26), weak internet connectivity ( $\bar{x}$ =1.17), and distance of network connectivity from office ( $\bar{x}$ =1.06). This finding reveals that the problem of use of e-resources are poor internet access, high cost of internet, combined with complexity of usage. This is consistent with the findings of Gichamba, Wagacha and Ochieng (2017) which enumerated technical and detailed language on the platforms, lack of internet bundles to access the online platforms, poor or complete lack of internet access in some regions of the country, poor usability of the e-extension platform, illiteracy among some farmers, lack of electric power in remote areas making it difficult for the e-extension officer to frequently access information and poor mobile network coverage in some regions challenges to assessment of e-Extension platform of Kenya. A study by Mtega et. al. (2014) also revealed that low internet connectivity was a major problem of using e-resources by agricultural researchers and extension staff in Tanzania. These challenges

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are therefore fundamental bottlenecks for the extension personnel even when they are willing to use the e-resources.

**Table 5: Perceived constraint to effective utilization of e-resources**

<b>Constraints</b>	<b>Mean</b>	<b>Std.Deviation</b>
Lack of awareness of e-resources among extension staff	1.36*	0.664
Complexity in usage of e-resources	1.07*	0.626
Unavailability of e-resources	1.35*	0.724
Lack of internet connectivity	1.28*	0.725
High cost of internet access	1.26*	0.678
Weak internet connectivity	1.17*	0.727
Poor attitude of extension workers to the use of e-resources	0.99	0.696
Far distance to network connectivity from office	1.06*	0.684

\*Values  $\geq$  cut-off point of 1.0

### Strategies for Improving Utilization of E-Resources

Table 6 shows perceived strategies to effective utilization of e-resources among respondents. It was indicated that regular training on the use of internet should be organized for extension personnel ( $\bar{x}$ =2.88). Also, government should provide free internet services to extension workers ( $\bar{x}$ =2.67), and all extension workers should be provided with computers ( $\bar{x}$ =2.65), Government should provide rural radio to aid extension service ( $\bar{x}$ =2.64), that all extension workers should be provided with smart phones ( $\bar{x}$ =2.58), and that research institutes and extension linkage platform should be made available on the internet ( $\bar{x}$ =2.57).

Other perceived strategies include; incorporating social media platform into the extension work ( $\bar{x}$ =2.4), and government should ensure that internet service providers operate at low tariff ( $\bar{x}$ =2.64). this is in line with the findings of Albert (2014) that "ICT can be made effective in extension delivery by the use of data based driven websites to make information sharing and access easier ( $\bar{x}$ =2.50), increasing the recognition of internet and intranet as a tool for supporting information learning ( $\bar{x}$ =2.50), giving attention to ICT training for staff responsible for agricultural and rural development ( $\bar{x}$ =2.50), creating agricultural websites ( $\bar{x}$ =2.50), introducing farmers to agricultural website ( $\bar{x}$ =2.60) and creating zonal internet centres in communities or LGAs ( $\bar{x}$ =2.55)

Electronic agricultural extension depends on the computer and internet technology, which requires the training of agricultural extension agents on the use of these technologies, and diffusion of training programs in rural areas as well as adoption of these technologies (computer and internet) among agricultural extension agents and their application in agricultural extension. According to Albert (2014), education (training) is expected to positively influence extension agents (and farmers') ability to source and use ICT including information on how to operate it. In other words, educated farmers are more likely to participate in ICT in order to put into practice the knowledge they may have acquired from extension agents.



**Table 6: Perceived strategies to effective utilization of e-resources**

<b>Strategies</b>	<b>Mean</b>	<b>Std. Deviation</b>
Regular training on the use of internet should be organized for extension personnel	2.88*	0.323
Social media platform should be incorporated into the extension work	2.42*	0.695
Research institutes and extension linkage platform should be made available in the internet	2.57*	0.630
Farmers and extension workers linkage platform should be made available in the internet	2.36*	0.727
Government should provide free internet services to extension workers	2.67*	0.700
E-agriculture should be introduced into Nigeria agriculture	2.57*	0.653
All extension workers should be provided with computers	2.65*	0.564
All extension workers should be provided with smart phones	2.58*	0.628
Government should provide rural radio to aid extension service	2.64*	0.514
Government should ensure that internet service providers operate at low tariff	2.64*	0.641

**\*Values  $\geq$  cut-off point of 2.0**

### **Conclusion and Recommendations**

Findings revealed that public extension personnel in the area were aware of some major e-resources like Email, Facebook, 2go and WhatsApp, but made little or no use of those e-resources in exchanging agricultural information with stakeholders. The major challenges that hindered their effective adoption of these e-resources in discharging their duties were complexity in usage of e-resources, unavailability of e-resources, lack of internet connectivity, high cost of internet access, weak internet connectivity, and distance of network connectivity from office. Governments and other development agencies should prioritize regular training of the extension personnel on the use of internet. Also, government should provide internet access to extension workers, as well as the requisite ICT tools such as computers and/or smart phones. On the other hand, research, extension and farmers' linkage platforms should be made available on the internet, while social media platforms should be incorporated into extension strategies.

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