

Socio-Economic Determinants of Village Extension Agents' Use of Information and Communication Technology in Extension Services in South-South, Nigeria.

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ABSTRACT

The study examined the socio-economic determinants of Village Extension Agent's (VEAs) use of information and communication technology (ICT) in South-south, Nigeria. The study specifically investigated the socio-economic characteristics, level of use of ICTs and the socio-economic determinants of ICTs use by VEAs. Multistage sampling technique was used to select a total of 300 village extension agents from the study area. Data obtained through structured questionnaire were analysed using frequency counts, percentages; mean score, standard deviation and ordinary least square (OLS) multiple regression technique. The results showed that majority of the Village Extension Agents were male (54.7%), married (89%), with average age of 46 years, had tertiary education (87.3%) and working experience of 30 years. The level of ICT use had a grand mean of 2.14 out of a maximum of 5.00. The ICT used included mobile phone (GSM), radio, television, video, computer, personal email and internet. The socio-economic determinants of level of use of ICT were age ($t = 4.051$), education ($t = 3.708$), working experience ($t = 2.281$) and income ($t = 3.390$). The study concludes that village extension agents' level of use of ICT in extension services in the area was low. It was recommended that government and non-governmental organizations (NGOs) should focus on the identified socio-economic determinants of the level of use of ICT for advocacy and intervention.

Keywords: Socio-economic determinants, VEAs, ICTs Use, Extension Services.

INTRODUCTION

There is a consensus in the literature on the term 'Information and Communication Technology' (ICT) especially on its electronic nature and Information Technology based system. Food and Agriculture Organisation, FAO (1993) described ICT as technologies involved in collecting, processing, storing, retrieving, disseminating and implementing data and information using microelectronics, telecommunication and computers. Chapman and Slaymaker (2002) believe that ICTs are a range of electronic technologies which when converged in new configurations are flexible, adaptable, enabling and capable of transforming organizations and redefining social relations. According to Warren (2001), ICT is a multitude of media, including telephone, television, video, telex, voice information systems-and-fax as well as those requiring the use of personal computer fitted with a modem. In the same line, ICT has been described as a set of activities that

facilitate by electronic means the processing, transmission and display of information (ADB, 2003). According to the Technical Center for Agriculture and Rural Cooperation (CTA, 2003), ICT can be interpreted broadly as technologies that facilitate communication and the processing and transmission of information by electronic means. The description accommodates the full range of ICT, from the old information technology (IT) – radio, television and fixed telephones to the new ITs such as mobile phones, computer and the internet. ICT as it is known is a technology that facilitates communication, processing and the transmission of information by electronic means (Omotayo, 2005). Heeks cited in Gadzama and Akinola (2013) holds that ICTs are electronic devices for capturing, processing, storing and communicating information. Examples of these include various dimensions of both print and electronic media like GSM, bulletins, e-mail, telex, social media like face-book, twitter, you-tube, 2go, etc.

The transformation of agriculture is strongly anchored on the transformation of agricultural extension. Until agricultural extension experiences a major transformation on its primary mandate, total agriculture transformation may not be feasible. Agricultural extension is not static but moving in pattern and shades. It was in this light that agricultural extension was defined as an on-going process of getting useful information to farmers and assisting them to have necessary knowledge, skills and attitude to effectively utilize information or technology (Swanson, 1996 cited in Yahaya, 2011). The center of agricultural extension service delivery is communication. A paradigm shift in communication technology will do a great deal in agricultural extension transformation. The changing paradigms in agricultural extension from linear flow of information to pluralistic flow portends that new actors will emerge in the technology transfer pathways (Adeniyi, 2010). And ICT is the new actor in the technology transfer pathway. Agricultural extension which depends to a large extent on information exchange between and among farmers on one hand and a broad range of other actors on the other hand has been identified as one area in which ICT can have a particularly significant impact.

ICT facilities can play a crucial role in the Nigerian Agricultural Transformation Agenda (ATA) by enabling and facilitating agricultural innovation systems, providing rapid and efficient means of sharing and accessing information across the entire agricultural sector through the application of these tools:

- Radio.
- Television.
- Cinema.
- Phones (GSM).
- Video.
- Computer.
- CD-ROM.
- Internet.
- Geographic Information System (GIS).
- Blogging.
- Digital wallet (E-wallet).
- Organizational e-mail.
- Organisational website.
- Personal e-mail.
- Personal website.

An overview of some of these ICT facilities, further highlight their relevance and usefulness to agricultural extension communication.

In a bid for Nigerian government to bridge the digital divide, it launched the Nigerian economy into the information age with NIGCOMSAT-1 in December, 2005. This was planned to have coverage over Africa and Europe. Nigerian government also commenced the building of a National Information Infrastructure Backbone (NIIB), State Information Infrastructure Backbone (SIIB) and Local Information Infrastructure Backbone (LIIB). Rural Internet Resource Centers and Mobile Internet Units have been established for accelerating ICT diffusion into the rural areas of Nigeria (NITDA, 2003). In 2004, the Nigerian government also announced the details of a National Rural Telephone Programme (NRTP), which proposes to connect 500,000 new lines in 343 local government areas within twelve months. The programme has an investment of ₦28 billion (US\$ 200 million) provided as a concessionary loan from the Chinese government and a matching grant of ₦2.8 billion from the Federal Government (Yekinni & Olaniyi, 2007). With this laudable effort of government, it is only pertinent to ascertain through empirical data the

awareness, access, and use of ICT facilities to justify the government's huge investment in ICT. In Nigeria, research has not brought a clear picture of the level of usage of ICT facilities by extension workers, especially in the South-South Geopolitical Zone. This has resulted in a knowledge gap. The ensuing gap has been a serious constraint to formulating policies and designing programmes for improvement.

OBJECTIVE OF THE STUDY

The purpose of the study is to examine the socio-economic determinants of VEAs level of ICT use in extension services in South-South Nigeria. The specific objectives were to:

- a. ascertain the socio-economic characteristics of village extension agents {VEA} in the study area,
- b. identify the available ICT tools in their extension services and
- c. ascertain the level of use of ICT tools by VEAs in extension services.

HYPOTHESIS OF THE STUDY

There is no significant relationship between the socio-economic characteristics of VEAs and their level of use of ICT tools.

METHODOLOGY

The study was conducted in South-South geopolitical zone of Nigeria. The area comprises six states of Akwa-Ibom, Bayelsa, Cross-River, Delta, Edo and Rivers. The area lies between latitude 4°10' and 7°30' North and longitude 4°30' and 9°45' East. The total land area of the zone is 112,110 square kilometres (Wikipedia, 2014). The area has a population of 21,044,081 million people (National Population Commission, 2006). The target population for this study were the village extension agents (VEAs) of the states' ADPs of South-South Nigeria. A multistage random selection technique was adopted in selecting the respondents. Using proportionate sampling of 40%, a total of 302 respondents were sampled thus:

States	Agricultural Zones	No. of EAs	No. of EAs Sampled	Total
Delta	Delta North	80	32	80
	Delta South	48	19	
	Delta Central	72	29	
Rivers	Zone 1	90	36	112
	Zone 2	95	38	
	Zone 3	97	38	
Akwa Ibom	Ikot Ekpene	63	25	110
	Uyo	61	25	
	Abak	59	24	
	Eket	40	16	
	Etinam	28	11	
	Oron	23	9	
Total VEAs				302

However, only 300 copies of returned questionnaire were properly filled and thus were used for the study. A questionnaire was used to collect the data for the study. Data were analysed using frequency table, percentages, mean score and standard deviation while ordinary least square multiple regression was used to test the hypothesis.

RESULTS AND DISCUSSION

The results in Table 1, showed that the largest proportion of the VEAs (45.6%) was between the ages of 41 – 50 years. This was followed by the age group 51 – 60 years (37.0%). Whereas 31 – 40 years was 9.7%, the least proportion was the group below 30 years of age (7.7%). The mean age was 46.2 years. This shows that most of the extension agents are in their economically active and productive ages, hence there is high prospect for ICT usage. This implies that VEAs will be able to respond and meet the needs of farmers using variety of communication strategies. This result confirmed the findings of Tologbonse *et al.* (2011) and Asadu *et al.* (2013) that a greater proportion of village extension agents (VEAs) were within the age range of 41 – 50 years in Niger and Imo States respectively.

The table also revealed that majority of the VEAs (54.7%) were male while the remaining 45.3% were female. This shows that male VEAs dominate

the extension scheme of the ADP system. This agrees with the findings of Adedoyin, Fapojuwo and Torimiro (1999) that male dominate the workforce in Nigeria's agricultural sector.

The educational distribution of the VEAs revealed that majority (87.3%) of the VEAs had tertiary education while 12.7% had secondary education.

The result shows that 44.3% had between 21 – 30 years working experience while 32.7% had between 11 – 20 years working experience. Also, 14.3% had below 10 years working experience while 8.7% had more than 30 years of working experience. The mean number of years of working experience was 20 years with a range of 1 year to 30 years. The result implies that the VEAs had reasonable years of working experience. Experience is a priceless asset.

On the average monthly income of the VEAs, the table showed that majority of the VEAs (33.7%) earn between ₦61,000 – ₦80,000 monthly. Also, 23% earn between ₦41,000– ₦60,000 while 22.6% earn above ₦101,000. Also, 4.7% earn less than ₦40,000 monthly. The average monthly income was ₦60,000. Based on the average monthly income, it could be difficult for a VEA to obtain some of the ICT facilities after taking care of the basic/physiological needs. This therefore makes government intervention imperative.

Table 1: Socio-economic characteristics of VEAs in the study area

Variables	Freq.	%	Mean
Age			
< 30	23	7.7	
30 – 39	29	9.7	
40 – 49	137	45.6	46.2
50 – 59	111	37.0	
Sex			
Male	164	57.7	
Female	136	45.3	
Marital Status			
Single	22	7.3	
Married	267	89.0	
Separated	11	3.7	
Household Size			
1 – 3	90	30.0	
4 – 6	151	50.3	4
7 – 9	59	19.7	
Education			
Primary education	-	-	
Secondary education	38	12.7	
Tertiary education	262	87.3	
Working Experience			
1 – 10	43	14.3	
11 – 20	98	32.7	
21 – 30	133	44.3	
31 and above	26	8.7	
Monthly Income			
≥ 40,000	14	4.7	
41,000 – 60,000	69	23.0	
61,000 – 80,000	101	33.7	

81,000 – 100,000	48	16.0
101,000 and above	68	22.6

Availability of ICT facilities to VEAs in the study area had 3.16 mean score and standard deviation of 0.93. Based on 2.50 discriminating index, seven (7) out of the fifteen (15) listed ICT facilities had mean values above the discriminating index (≥ 2.50) and thus were adjudged the ICT facilities available to VEAs in the study area. The GSM (phone) had the highest mean value of 3.93 with a standard deviation of 0.026. This was followed by radio and television with 3.92 mean scores and standard deviations of 0.27 each. Video

Also, computer and personal e-mail had 2.90 mean score and standard deviation of 0.99 each. Internet had 2.63 mean score and a standard deviation of 1.09. Supporting the above findings, Adejo and Haruna (2009) observed that rural people have access to ICTs in the decreasing order of phone (GSM), radio, television and computer.

Table 2: Distribution of VEAs by availability of ICT facilities

ICT Facilities	Readily available		Available		Scarcely available		Not available		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Mean	SD
1. Phones (GSM)	278	92.7	22	7.3	–	–	–	–	3.93*	.26
2. Radio	277	92.3	23	7.7	–	–	–	–	3.92*	.27
3. Television	277	92.3	23	7.7	–	–	–	–	3.92*	.27
4. Video	132	44.0	109	36.3	34	11.3	25	8.3	3.16*	.93
5. Computer	90	30.0	133	44.3	35	11.7	42	14.0	2.90*	.99
6. Personal email	144	48.0	37	15.7	45	15.0	64	21.3	2.90*	.99
7. Internet	73	24.3	112	37.3	45	15.0	70	23.3	2.63*	1.09
8. Cinema	62	20.7	35	11.7	101	33.7	102	34.0	2.19	1.12
9. Personal website	94	31.3	22	7.3	16	5.3	168	56.0	2.14	1.37
10. Organizational website	11	3.7	59	19.7	19	6.3	211	70.3	1.57	.93
11. CD-ROM	17	5.7	5	1.7	87	29.0	191	63.7	1.49	.79
12. Organisational e-mail	13	4.3	31	10.3	45	15.0	211	70.3	1.49	.79
13. Digital wallet (E-wallet)	–	–	33	11.0	76	25.3	191	63.7	1.47	.69
14. Geographic information system (GIS)	10	3.3	–	–	44	14.7	246	82.0	1.25	.62
15. Blog	–	–	–	–	26	8.7	274	91.3	1.09	.28

*Available (mean > 2.50). Grand mean = 2.40 *Source: Field Survey, 2015.*

VEAs level of ICT use in the study area

Based on 2.50 discriminating index, seven (7) out of fifteen (15) listed ICT facilities had mean values above the discriminating index (≥ 2.50) and thus were adjudged the ICT facilities the VEAs used. The GSM (phone) had the highest mean value of 3.77 with a standard deviation of 0.72. This was closely followed by radio and television with 3.70 and 3.51 mean values and standard deviation of 0.68 and 0.90 respectively. Video had 2.56 mean score and

standard deviation of 1.11 while computer had 2.53 mean value and 1.13 standard deviation. Also, personal e-mail had 2.51 mean score and 1.33 standard deviation while internet had 2.50 mean score and 1.16 standard deviation. The standard deviation value for ten out of fifteen listed ICT facilities were tending to zero. This implies that the values were very small indicating that VEAs did not differ much in their responses.

Table 3: Distribution of VEAs level of ICT use

ICT Facilities	Very Often		Often		Sometimes		Never		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Phones (GSM)	266	88.7	16	5.3	1	.3	17	5.7	3.77*	.72
2. Radio	237	79.0	47	15.7	5	1.7	11	3.7	3.70*	.68
3. Television	212	70.7	55	18.3	8	2.7	25	8.3	3.51*	.90
4. Video	79	26.3	79	26.3	73	24.3	69	23.0	2.56*	1.11
5. Computer	82	27.3	57	19.0	90	30.0	71	23.7	2.53*	1.13
6. Personal e-mail	112	37.3	12	4.0	61	20.3	115	38.3	2.51	1.33
7. Internet	69	23.0	31	10.3	93	31.0	107	35.7	2.50	1.16
8. Personal website	57	19.0	24	8.0	47	15.7	172	57.3	1.89	1.19
9. Cinema	28	9.3	19	6.3	78	26.0	175	58.3	1.67	.95
10. CD-ROM	18	6.0	4	1.3	71	23.7	207	69.0	1.44	.80
11. Organizational e-mail	3	1.0	8	2.7	57	19.0	232	77.3	1.27	.56
12. Organizational website	2	.7	8	2.7	52	17.3	238	79.3	1.25	.53
13. Digital wallet (E-wallet)	–	–	10	3.3	42	14.0	248	82.7	1.21	.48
14. Geographic information system (GIS)	–	–	1	.3	57	19.0	242	80.7	1.20	.41
15. Blog	–	–	–	–	22	7.3	278	92.7	1.07	.26

*Significant (mean \geq 2.50) Grand mean = 2.14

Source: Field Survey, 2015.

Relationship between socio-economic characteristics and VEAs level of ICT use

Ordinary least square multiple regression analysis produced the t-ratios that were used to test the hypothesis. Based on the appropriateness of the signs, number of significant variables and magnitude of the R^2 , the linear function was chosen as the lead equation. The result reveals that about 60 percent variation in use of ICT facilities could be explained by the combined effects of the socio-economic variables in the equation. The result indicates that four of the seven independent variables (Age, education level, working experience and income)

correlated positively and significantly with the level of use of ICT facilities. The study of Adekoya and Tologbonse (2011) also confirmed that non-adoption of a new technology is often related to or caused by non-technological factors such as social, psychological, cultural and economic. Similarly, Gadzama *et al* (2013) added that the problem of adopting ICT facilities is either due to literacy level, ignorance or poor income. Based on the average monthly income of VEAs, it could be difficult for a VEA to obtain some of the ICT facilities after taking care of the basic family needs.

Table 4: Socio-economic determinants of VEAs' level of use of ICT

Variables	Linear Function	Double Log	Semi-log	Exponential Function
Constant	2.800	3.754	3.368	3.347
Standard error	0.133	0.185	0.252	0.098
R ²	0.599	0.458	0.412	0.329
N	300	300	300	300
F-value	12.555	11.070	11.251	12.401
Age (x ₁)	0.005 (4.051)*	0.000 (0.227)	0.052 (1.007)	0.098 (0.310)
Sex (x ₂)	0.702 (0.383)	0.998 (0.002)	0.909 (0.115)	0.635 (0.475)
Marital status (x ₃)	0.677 (0.417)	0.820 (0.228)	0.002 (3.111)*	0.022 (1.643)
Household size (x ₄)	0.353 (0.931)	0.470 (0.724)	0.347 (0.941)	0.480 (0.707)
Education level (x ₅)	0.000 (3.708)*	0.002 (1.227)	0.883 (0.147)	0.582 (0.551)
Working experience (x ₆)	0.023 (2.281)*	0.046 (2.007)*	0.056 (1.916)	0.019 (2.363)*
Income (x ₇)	0.000 (3.930)*	0.003 (2.945)*	0.003 (2.957)*	0.008 (1.961)*

Source: Field Survey, 2015.

*Significant at 5% level.

CONCLUSION AND RECOMMENDATION

The use of ICT facilities had reduced the world into a global village thus bridging access to professional information from anywhere in the world. Agricultural extension is one area where ICT has great promises. In the advanced countries of the world, agricultural extension had grown beyond the use of radio and television to the use of computer, internet and e-mail (cyber extension). If ICT is adopted and properly applied, ICT has the potentials to really transform agricultural extension in developing countries like Nigeria. Based on the findings, the following recommendations were made: 1. Government to intensify extension education campaign on ICT use. 2. The socio-economic determinants of level of use of ICT; age, education, working experience and income should guide and direct policies and programmes in ICT provision and use.

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