Journal of Agriculture, Environmental Resources and Management

Journal of Agriculture, Environmental Resources and Management
ISSN2245-1800(paper) ISSN 2245-2943(online)
7(9)1-800; **August**.2025; pp21- 29

www.saerem.com

Determinants of Information and Communication Technology (ICT) and Social Media Utilization by Village Extension Agents in the Northern Agricultural Zone of Plateau State, Nigeria

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Abstract

The increasing role of digital technologies in agricultural transformation necessitates understanding how extension personnel utilize ICT and social media platforms for service delivery. This study examined the determinants of ICT and social media utilization by Village Extension Agents (VEAs) in the Northern Agricultural Zone of Plateau State, Nigeria. A multi-stage sampling procedure was used to select 92 VEAs, and data were collected with structured questionnaires and analyzed using descriptive statistics and regression models. Findings on socio-economic characteristics revealed that the majority of VEAs were male (84%) and married (97%), with a mean age of 48 years, an average household size of 4 persons, mean work experience of 20 years, and a mean monthly income of ₦218,962. All respondents possessed tertiary education, underscoring a highly educated workforce. With respect to ICT use, phone calls (99%), SMS (74%), and WhatsApp (50%) were the most frequently adopted platforms, whereas advanced digital tools such as email, Twitter, and Zoom/Google Meet recorded no utilization. Regression analysis indicated that age, educational status, household size, and monthly income significantly influenced ICT and social media use, highlighting the role of socioeconomic factors in digital adoption. The major constraints identified included limited institutional support (66%), poor internet connectivity (64%), and limited awareness of available platforms (56%), alongside erratic power supply (54%). The study concludes that ICT and social media have significant potential to enhance extension communication, but infrastructural, institutional, and awareness-related challenges impede their full integration into extension systems. It recommends targeted digital literacy training, improved ICT infrastructure and rural electrification, supportive institutional policies, and deliberate awareness creation on emerging platforms to strengthen VEAs' capacity for effective, inclusive, and technology-driven extension service delivery.

Keywords: Determinants, ICT, social media, utilization, village extension agents,

Introduction: Sustainable agricultural development cannot be achieved successfully without accurate and up-to-date information and technologies to cope with globalization and its simultaneous rapid technological changes. This is because information is important for the development of any society and success for human endeavor (Sokoya, Adefunke and Fagbola, 2014). According to Tiwari and Sharma (2015), information is considered the fifth human need after air, water, food and shelter. Agricultural information refers to data, knowledge, and advice that is relevant to farming activities and agricultural practices. This information is essential for farmers to make informed decisions about crop production, livestock management, pest and disease control, market trends, and other aspects of agriculture. Access to timely and accurate agricultural information helps farmers improve their productivity, adapt to changing conditions, and make better economic decisions. Therefore, the concept of agricultural information in general and in particular, as a source of development, is of great importance in the contemporary world and cannot be overemphasized (Ogbonna and Aguvu, 2013). In recent years, Information and Communication Technology (ICT) and social media platforms have emerged as key tools for bridging agricultural information search gap. There is hardly an area of human activity today that has not been touched by dramatic changes in information and communication technologies (ICT). The rapid advancements in Information and Communication Technology (ICT) have revolutionized various sectors globally, including agriculture. Ozor and

Madukwe (2009) conceived ICT as a set of technologies that facilitate the processing, storage, retrieval and transmission of information. Information and communication technologies can be broadly defined as technologies that simplify communication, through the process and transmission of information through electronic media (Suleiman *et al*., 2015).

Social media on the other hand refer to a website or internet service that allows users to interact with each other and create content instantaneously. They are wide range of internet-based and mobile services that allow users participate in online exchanges, contribute user-created content or join online communities (Michael, 2012). The evolution of social media provided a visible solution to the challenge of information gap that hinders improvement of standard of living of people and achievement of development (Ministry of Agriculture (MOA), 2013). This is premised on the fact that social media enable blogging, tagging, discussion, networking, and so on and help to transfer information to large audiences at the same time and at a cheaper rate (Sokoya, Onifade and Alabi, 2012). Social media have long been used in agriculture for facilitating communication among stakeholders, especially extension personnel (Sophie, 2013). According to Italie (2015) social media is the most recent form of digital communication and on a global scale accessing news through it by using mobile devices is gaining popularity. Within a few years, it has completely changed communication globally (Suchiradipta and Saravanan, 2016) and has become extremely popular because it allows people to connect in the online world to form a group, a forum and a community where ideas and information can be exchanged without any geographical barrier (Chui, Manyika, Dobbs, Roxburgh, Sarrazin, Sands. and Westergrens, 2012).. They have impacted global development making people more informed and aware. A study conducted by Balkrishna and Deshmukh, (2017) revealed some benefits of social media in agriculture such as prompt response to questions relating to the field, saves time and cost of communication, provision of right information and at the right time like weather report, disease control, etc. Unfortunately, farmers, extension agents and other stake holders in agriculture may not be familiar with these benefits of social media.

Arable farming entails the production of wide range of food crops or annual crops. This entails crops in which the life cycle is within one year; from germination to seed production and maturity. Arable crops included; yam, maize, cocoyam, cassava, among others. Within the agricultural sector, the crops sub-sector is the largest, with arable crop production dominating about 30 percent of overall GDP (CBN, 2016). Dissemination of useful agricultural information to the farmers will enhance arable crop production. New approach for improving access to relevant agricultural information could be achieved through the use of information and communication technologies (Olaniyi and Ismaila, 2016). ICT provide recent knowledge and information on agricultural technologies, best practices, markets, price trends, and weather conditions (Yimer, 2015). Farmers need information on improved farm inputs, modern farming technologies, and climate change to enhance food production for ever increasing population. Important agricultural information such as sowing, improving soils, profit maximization and control pests and diseases will empower the farmer and their decision making capabilities (Lokeswari, 2016). ICT is an effective solution to problems that militate against the development of agricultural industry, such as weak marketing linkages, poor information management, low productivity, low income and lack of diversity (Ramli, Samah, Hassan, Omar, Bolong and Shaffri (2015). The ICT devices which are of potential dissemination of agricultural information in farming activities include like radio, television, cellular phones, computers, and networks among others (Pande and Deshmukh, 2015). Agricultural extension in Nigeria continues to face structural and operational constraints, including inadequate funding, limited extension coverage, and weak information dissemination channels. In Plateau State, where farming is predominantly smallholder-based, farmers often lack timely access to agricultural information. ICT and social media offer promising avenues for overcoming these challenges, yet their adoption by extension personnel is not universal. Factors such as digital literacy, access to ICT facilities, institutional support, and perceived relevance of ICT in extension could influence utilization. Understanding the determinants of ICT and social media utilization among extension personnel is critical to improving advisory services. Without this knowledge, investments in ICT infrastructure and training may yield suboptimal outcomes, limiting the potential benefits for farmers. The broad objective of the study is to examine village extension agents' utilization of ICT and social media in extension services in the northern agricultural zone of Plateau State, Nigeria. The specific objectives were to; describe the socio-economic characteristics of the village extension agents (VEAs), ascertain their level of utilization of ICT and social media in extension services delivery, determine the factors influencing their use of ICTs and social media and identify the constraints to the use of ICT and social media by VEAs.

Materials and Methods: Study Area: Plateau State is located in the North-Central region of Nigeria. It lies between latitude 8°24′N and 10°36′N and longitude 8°32′E and 10°38′E, with Jos as its capital. The state covers a total land area of about 26,899 square kilometers and shares boundaries with Kaduna State to the northwest, Nassarawa State to the southwest, Taraba State to the southeast, and Bauchi State to the northeast. According to the 2006 National Population Census, Plateau State had a population of 3,206,531 people. With an annual growth rate of 3.2%, the projected population of Plateau State in 2024 is about 5.88 million people. The state is endowed with fertile soils, favorable climate, and varied vegetation that support the cultivation of arable crops such as maize, rice, Irish potatoes, vegetables, and tree crops. Livestock farming, including poultry, sheep, goats, and cattle, is also common. Administratively, agricultural extension delivery in Plateau State is under the Plateau Agricultural Development Programme (PADP), which divides the state into three agricultural zones for ease of operation. This study focused specifically on the Northern Agricultural Zone, which covers LGAs such as Jos North, Jos South, Jos East, Bassa, Barkin Ladi, and Riyom. The zone is characterized by relatively

high literacy levels, vibrant agricultural activities, and wider access to ICT facilities compared to some other zones, making it a suitable area for the study on ICT and social media utilization by extension personnel.

Sampling Technique and Sample Size: The population for this study comprised all the Village Extension Agents (VEAs) of the Plateau Agricultural Development Program (PADP) operating within the Northern Agricultural Zone of Plateau State. To ensure that the sampling frame was clearly defined, a preliminary survey was conducted in collaboration with the PADP zonal office. This exercise helped to identify the exact number and distribution of VEAs across the six Local Government Areas (LGAs) that make up the Northern Agricultural Zone, namely: Jos North, Jos South, Jos East, Bassa, Barkin Ladi, and Riyom. In addition, the assistance of serving VEAs in each LGA was sought to verify the lists obtained, thereby guaranteeing the accuracy and reliability of the sample frame used for the study. A two-stage sampling technique was employed. In the first stage, Plateau North Agricultural Zone was purposively selected because of its high concentration of agricultural activities and the significant role of extension delivery in the area. In the second stage, all the VEAs enumerated in the sample frame were included in the study. Specifically, the distribution was as follows: 14 VEAs from Jos North, 15 from Jos South, 17 from Jos East, 15 from Bassa, 18 from Barkin Ladi, and 13 from Riyom. This brought the total number of VEAs in the zone to 92, which constituted the final sample size for the study. The decision to use the entire population of VEAs in the zone (100% sampling) was informed by their relatively small number, which made complete enumeration feasible and allowed the study to avoid sampling errors that might have arisen from selecting only a subset.

Method of Data Analysis: Both descriptive and inferential statistical tools were employed in analyzing the data The general functional form is:

$Y = f(X_1, X_2, X_3, \ldots, Xn) + e$

The linear form is stated as:

$$Yi = \beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\beta_4 X_4+\beta_5 X_5+\beta_6 X_6+\beta_7 X_7+\beta_8 X_8+\beta_9 X_9+ei$$

Where;

Yi = Utilization Index (dependent variable)

X_1= Age (years)

X_2 = Gender (male = 1, female = 0)

X_3 = Marital status (married = 1, otherwise = 0)

X_4 = Educational level (years of formal education)

X_5 = Years of extension experience

X_6 = Household size (number of persons)

X_7 = Monthly income (₦)

X_8 = Membership of professional associations (yes = 1, no = 0)

collected, in line with the specific objectives of the study. Descriptive statistics such as frequency counts, percentages and means were used to summarize the socio-economic characteristics of the respondents (objective 1) and the constraints to ICT and social media use by the VAEs (objective 5). Utilization index was used to ascertain the level of utilization of ICT and social media by VEAs (objective 4) while multiple regression was used to determine the factors influencing the use of ICTs and social media by VEAs (Objective 4).

Utilization Index: Respondents were asked to indicate whether they made use of a list of ICT tools and social media platforms (such as phone calls, SMS, WhatsApp, Facebook, YouTube, email, radio, television, twitter and Zoom/Google Meet) in their extension activities. Each ICT/social media tool was scored 1 if used and 0 if not used. The total number of tools used by each respondent was then expressed as a percentage of the total number of tools listed, giving a utilization index that ranged from 0% (no tool used) to 100% (all tools used). The utilization index was analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation to show the general pattern of ICT and social media utilization among VEAs. The index also allowed for classification of respondents into low, medium, and high utilization categories, which further highlighted differences in usage levels across the study area.

Multiple regression: Multiple regression analysis was employed to identify the socio-economic and institutional factors influencing the utilization of ICT and social media by VEAs. The utilization index (expressed as a percentage) served as the dependent variable, while the explanatory variables included age, gender, marital status, educational level, years of extension experience, monthly income, access to ICT training, access to internet facilities, and membership of professional associations.

β_0 = Constant term

$\beta_1 \ldots \beta_9$ = Regression coefficients

ei = error term

Results and Discussion: Socio-economic Characteristics of Farmers: The socio-economic characteristics of VEAs in the study area are presented in Table 1. The results show that a majority (53.0%) of the respondents were between the ages of 41–50 years, while 38.0% were above 50 years, and only 9.0% were within the age range of 31–40 years. The mean age was 48.4 years, indicating that most of the extension agents were in their middle to late adulthood. This suggests that the VEAs were relatively experienced but possibly older, which may affect their flexibility and adaptability in the use of modern ICT tools and social media platforms. Similar findings were reported by Vihi, Tor, Jesse, Dalla, Onuwa, & Haroun (2021). They noted that older extension workers dominate the system, raising concerns about the uptake of emerging digital technologies in extension delivery. Gender distribution revealed that the majority (84.0%) of the VEAs were male, while only 16.0% were female. This result underscores the gender imbalance in agricultural extension delivery, consistent with the observation of Vihi *et al*, (2021) who adduced the dominance of male VEAs to the traditional consideration in favor of the male child in almost every facet of the society. Thus, most extension agencies see the male VEAs as utility and valuable workers who can go the extra mile without cultural inhibition. This possibly favors their employment

In terms of marital status, an overwhelming 97.0% of VEAs were married, while only 3.0% were single. This shows that most respondents were socially responsible adults with family obligations, which could either strengthen their commitment to stable employment or limit their mobility and adaptability to extension demands. This finding collaborates the work of Yakubu, Abubakar, Atala and Muhammed (2013) who in their study on use of information and communication technologies among extension agents in Kano state, Nigeria reported that the entire (100%) agricultural extension agents in the area were married implying that most of them are responsible and would be committed to their duties providing reliable and useful information to farmers in the course of their extension service delivery. Regarding educational attainment, all (100%) of the respondents had tertiary education, showing that the VEAs were well-educated and professionally qualified. This is a positive indicator for effective extension delivery, as higher education levels are associated with better skills in communication, knowledge transfer, and ICT adoption. The educational level of any extension agent determines the quality of his skill, his cognitive abilities, technical competence and shows how well and appropriate technological innovation can be transferred to farmers. Education has been identified as a catalyst in agriculture and other productive activities because it broadens the mental horizon, influences the totality of the mind and predisposes individuals to new ideas (Ndaghu, 2011). Adequate education therefore could enhance agricultural extension agents' understanding of use of ICTs and sources of information on improved innovation for agricultural practices. Household size distribution indicates that 75.0% of the respondents had between 1–5 members in their household, 23.0% had 6–10, and only 2.0% had more than 10, with a mean household size of 4. This suggests that most VEAs maintained relatively small households, which could positively affect their economic stability and ability to invest in ICT facilities. Work experience showed that 57.0% of VEAs had over 20 years of experience, 30.0% had 11–20 years, and only 13.0% had 1–10 years, with a mean of 19.8 years. This implies that most VEAs were highly experienced, which could positively influence their technical competence, though their long service may also be associated with lower adaptability to new ICT innovations compared to younger agents. This observation aligns with Fadipe, Ilori, Adewunmi, & Oladele (2024) who also confirmed reasonable years of experience of VEAs as a catalyst in effective dissemination of different agricultural innovations and ICT usage On monthly income, the majority (39.0%) earned between ₦201,000–₦250,000, while 24.0% earned between ₦151,000–₦200,000, and 21.0% earned ₦251,000–₦300,000. Only 3.0% earned between ₦50,000–₦100,000, and 6.5% earned above ₦300,000. The mean income was ₦218,962, which is relatively high compared to rural farmer income levels. This suggests that VEAs were moderately well-remunerated, which could enhance their ability to afford ICT tools and internet subscriptions necessary for extension work. However, variation in income levels may still influence the extent of ICT utilization.

Level of Utilization of ICT and Social media Platforms by VEAs: The result presented in Table 2 shows that phone calls (99%) were the most utilized ICT tool among Village Extension Agents (VEAs). This finding underscores the central role of the mobile phone in extension communication, as it remains affordable, reliable, and accessible in most rural communities. The near-universal use of phone calls suggests that VEAs rely heavily on this medium for one-on-one advisory services, quick feedback, and coordination with farmers. This result corroborates earlier studies such as Enwelu, Enwereuzor, Asadu, Nwalieji & Ugwuoke (2017) who also reported that the major ICT used by extension workers in Anambra state was mobile phones. Similarly, short message service (SMS) was widely used by the respondents (74%). The high level of SMS utilization is expected, as it provides a cost-effective, low-bandwidth means of sending timely information such as weather forecasts, pest alerts, or reminders to farmers without requiring internet connectivity. This aligns with the findings of Olaniyi, Akintonde, and Fadeyi (2019), who reported that SMS was among the most commonly adopted ICT tools by extension agents because of its simplicity and affordability. Among social media platforms, WhatsApp (50%) emerged as the most commonly utilized. The platform is increasingly popular because it allows real-time sharing of text, audio, images, and videos, while also enabling the creation of interactive groups for farmers and extension workers. WhatsApp has proven particularly effective for

building networks, facilitating farmer-to-farmer learning, and overcoming literacy barriers through the use of voice notes. This result is consistent with the observations of Ibe *et al*. (2023) that WhatsApp is one of the key social media platforms utilized by agricultural practitioners in information transmission.

On the other hand, only 23% of VEAs reported using Facebook, while radio (16%) and television (3%) were minimally used. Contrary to this finding, Fadipe *et al* (2024) reveal that WhatsApp is one of the major social media platforms used for extension service delivery in Ogun State. Although radio remains a critical source of agricultural information for rural farmers, its low usage by VEAs in this study could be attributed to the fact that broadcasting usually requires organizational arrangements, airtime, and sponsorship, which are beyond the direct control of individual agents. Nevertheless, radio programs can still be integrated with phone and WhatsApp follow-ups to maximize outreach.

Interestingly, platforms such as YouTube, email, Twitter, and Zoom/Google Meet recorded no usage at all. This suggests that VEAs operate in environments where internet access is poor, data costs are high, and digital literacy remains low, limiting the adoption of advanced ICT platforms. Okeke, Nwalieji, & Uzuegbunam (2025) highlighted similar constraints, noting that poor internet connectivity, irregular power supply, and inadequate institutional support remain major barriers to ICT adoption in agricultural extension. Overall, the findings suggest that VEAs predominantly rely on ICT tools that are cheap, accessible, and require minimal internet connectivity (phone calls, SMS, WhatsApp). In contrast, platforms that demand higher internet bandwidth and greater digital proficiency are not widely adopted. This indicates that while progress has been made in the integration of ICT into extension service delivery, significant infrastructural and capacity gaps must be addressed to enhance the use of more advanced digital platforms.

Factors Influencing ICT and Social Media Use among the VEAs : The regression analysis of factors influencing ICT and social media use among Village Extension Agents (VEAs) is presented in Table 4. The model had an R^2 value of 51.96%, which indicates that approximately 52% of the variation in ICT and social media use by VEAs was explained by the independent variables included in the model. The F-statistic (767.886) was statistically significant at 1% level, suggesting that the model as a whole is a good fit for the data. The regression result show that out of the eight predictors included in the model, four variables were statistically significant in influencing ICT and social media use among Village Extension Agents (VEAs). These were age, education, monthly income, and household size. The coefficient of age (–0.581) was negative and statistically significant at 1% level (p = 0.001). This result implies that older VEAs are less likely to use ICT and social media platforms compared to younger ones. In other words, the likelihood of ICT utilization decreases as age increases. This finding is consistent with earlier research by Vihi *et al.* (2021), which found that younger extension workers adopt ICT tools more readily because they are more digitally literate and adaptable to technological innovations. Education had a positive coefficient (0.944) and was statistically significant at the 1% level (p = 0.000). This means that higher levels of education significantly increase the probability of ICT and social media utilization among VEAs. Educated agents are more likely to be familiar with ICT tools, confident in their usage, and better positioned to integrate them into extension work. This corroborates the finding of Subhrajyoti, Yanglem, Lithan, Sabita, Pradhan and Pal (2019), that higher educational status significantly influenced the adoption of new technologies. Katengeza *et al*. (2011) showed that the use of mobile phone is positively affected by literacy. Monthly income (0.432) was positive and statistically significant at the 5% level (p = 0.041). This suggests that higher monthly income enhances the likelihood of using ICT and social media. Higher-income agents are better able to afford smartphones, internet subscriptions, and other related costs of ICT usage, thus making them more active users of digital platforms. This finding agrees with Vihi *et al*. (2021), who emphasized the role of financial capacity in enabling ICT adoption. Household size (–0.024) had a negative coefficient and was statistically significant at the 10% level (p = 0.083). This indicates that larger household sizes reduce the likelihood of ICT and social media use among VEAs, possibly because agents with larger families have more financial responsibilities, leaving fewer resources available for ICT-related expenses.

Constraints to Use of ICT and Social Media Platforms among Farmers : Table 4 presents the major constraints faced by Village Extension Agents (VEAs) in the use of ICT and social media platforms. The results indicate that limited institutional support (66.0%) ranked as the most severe challenge. This suggests that extension personnel often lack organizational backing in terms of ICT infrastructure, training, and policy support that could encourage full utilization of digital tools. Without such institutional support, the use of ICT remains at the personal effort of VEAs rather than being integrated into extension systems. Similar findings were reported by Oladele (2015), who emphasized that institutional bottlenecks remain a critical barrier to ICT adoption among extension agents in sub-Saharan Africa. The second-ranked constraint was poor network connectivity and internet access (64.0%), reflecting the infrastructural challenges common in rural areas where VEAs operate. Many rural communities still lack stable broadband access, making real-time communication and online learning difficult. This aligns with the report by Vihi *et al.* (2021), which noted that rural extension delivery in Nigeria is hampered by unreliable network coverage, thereby limiting ICT use in agricultural communication. Limited awareness of available platforms (56.0%) was ranked third. This indicates that even when ICT infrastructure exists, VEAs may not be fully aware of the variety of social media tools or specialized agricultural ICT platforms (such as e-extension portals) that could enhance their efficiency. A study by Yusuf, Salau, and Gana (2015) highlighted similar gaps, noting that many extension workers use only basic tools (calls, SMS, WhatsApp) and are unaware of broader ICT opportunities in extension delivery. The issue of erratic power supply (54.0%), ranked fourth,

further compounds these challenges. Constant electricity outages prevent continuous access to digital devices and the internet, making ICT-based extension unreliable. This is consistent with the findings of Arokoyo (2013), who stressed that inadequate rural electrification remains a bottleneck to ICT-driven agricultural extension. Interestingly, high cost of ICT devices and internet data (43.0%) and low digital literacy among VEAs and farmers (42.0%) ranked fifth and sixth, respectively. This suggests that while affordability and skills remain challenges, they are not as critical as institutional and infrastructural factors. However, in the long run, the high cost of smartphones, laptops, and recurring internet subscriptions can discourage continuous use. Similarly, inadequate ICT skills among VEAs and farmers hinder effective utilization of platforms beyond basic messaging applications. Studies by Agwu, Uche-Mba, and Akinnagbe (2008) support this finding, showing that the level of ICT literacy significantly influences adoption and use among extension workers. The least reported constraint was farmers' limited ICT access and literacy (34.4%). Although lower compared to other constraints, this is still significant because extension is a two-way communication process. If farmers lack access or skills to engage with ICT platforms, then the effectiveness of VEAs' digital initiatives is limited. Supporting the above findings, Asadu *et al.* (2013) observed that illiteracy among farmers, limited power supply, high cost of modern communication techniques, complexity of use, limited network services, lack of access to modern communication techniques and lack of skill among the extension agents constitute serious constraints to the use of ICT facilities by VEAs in Niger State. Asadu *et al.* (2013) opined that these constraints are more serious in rural areas. The use of GSM (phone), computer and television is common but it is also constrained by limited network coverage, poor connectivity and poor power supply.

Conclusion: The findings of this study show that Village Extension Agents in the Northern Agricultural Zone of Plateau State rely heavily on basic ICT tools such as phone calls, SMS, and WhatsApp for extension service delivery, while more advanced tools such as Zoom, Twitter, and email were rarely utilized. The utilization of ICT and social media was significantly influenced by age, education, monthly income, and household size. These factors highlight the importance of socioeconomic characteristics in shaping the adoption of ICT innovations. However, inadequate institutional support, poor internet connectivity, and low awareness of ICT platforms remain critical challenges limiting effective use. Thus, strengthening the ICT capacity of VEAs is crucial for improving agricultural extension services in the region.

Recommendations : Base on the findings of this study, it was recommended that regular training programs should be organized to enhance VEAs' digital literacy and expose them to the wide range of ICT tools and social media platforms available for extension work. Government and development partners should invest in ICT infrastructure such as internet connectivity and rural electrification to address major barriers like poor network access and erratic power supply. Extension organizations should integrate ICT use into their policies and provide incentives, devices, and allowances (e.g., data support) to encourage VEAs' adoption of digital tools. Efforts should be made to sensitize VEAs about emerging digital platforms and e-extension portals to enhance their efficiency in information dissemination. Support for female agents: Given the gender imbalance, more deliberate efforts should be made to recruit and empower female VEAs, ensuring gender-inclusive extension delivery.

Table 1: Socio-economic Characteristics of VEAs (n = 92)

Variable	Frequency	Percentage	Mean
Age			
31-40	8	9.0	
41-50	49	53.0	
>50	35	38.0	48.4
Gender			
Male	77	84.0	
Female	15	16.0	
Marital status			
Married	89	97.0	
Single	3	3.0	
Educational status			
Primary	0	0.0	
Secondary	0	0.0	
Tertiary	92	100.0	

Household size			
1-5	69	75.0	
6-10	21	23.0	
>10	2	2.0	4
Work experience			
1-10	12	13.0	
11-20	28	30.0	
>20	52	57.0	19.8
Monthly income (Naira)			
50,000- 100,000	3	3.0	
101,000-150,000	6	6.5	
151,000-200,000	22	24.0	
201,000-250,000	36	39.0	
251,000-300,000	19	21.0	
>300,000	6	6.5	218,962

Source: Field survey, 2025

Table 2: Level of Utilization of ICT and Social media Platforms by VEAs

ICT/ Social media Access	Frequency	Percentage
Phone calls	91	99.0
SMS	68	74.0
WhatsApp	46	50.0
Facebook	21	23.0
YouTube	0	0.0
Email	0	0.0
Radio	15	16.0
Television	3	3.0
Twitter	0	0.0
Zoom/Google Meet	0	0.0

Source: Field survey, 2025

Table 4: Factors Influencing ICT and Social Media Use among the VEAs

Variable	Coefficient	Std. Error	T-ratio	P-value	
Constant	1.071	0.689	1.55	0.120	
Age (X_1)	-0.581	0.168	-3.46	0.001***	
Gender (X_2)	-0.149	0.181	-0.82	0.411	
Marital status (X_3)	-0.850	0.711	-1.19	0.232	
Education (X_4)	0.944	0.213	4.43	0.000***	

Ext experience (X_5)	0.100	0.290	0.34	0.730
Monthly income (X_6)	0.432	0211	205	0.041**
Household size (X_7)	-0.024	0.014	-1.75	0.083*
Member of association (X_8)	-0.777	0.674	-1.15	0.249
R Square	= 51.96			
F statistics	= 767.886***			
Observations	= 92			

***, ** and *= Significant at 1%, 5% and 10%

Table 4: Constraints to Use of ICT and Social media by VEAs

Constraints		*Frequency	Percentage	Rank
Poor network connectivity and internet access	69	64.0	2nd	
High cost of ICT devices and internet data	78	43.0	5th	
Low digital literacy among VEAs and farmers	76	42.0	6th	
Limited awareness of available platforms	101	56.0	3rd	
Limited institutional support	119	66.0	1st	
Erratic power supply	97	54.0	4th	
Farmers limited ICT access and literacy	62	34.4	7th	

***Multiple responses**

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