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# Analysis of Factors Affecting Accessibility of Information Communication Technologies Among Cassava Farmers in Obubra Local Government Area Cross River State, Nigeria

***Udama, P. I., Edem, T.O and Anjorin, O. D.**
Department of Agricultural Economics and Extension,
University of Cross River State, Obubra Campus, Obubra, Nigeria.
*****Corresponding Author Email: Udamaphidel@unicross.edu.ng (Udama, P. U)

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**ABSTRACT:** *This study investigates the factors influencing the accessibility of ICT tools among cassava farmers in Obubra Local Government Area, Cross River State. Specifically, it describes the socio-economic factors of the cassava farmers, identifies the available ICT tools to cassava farmers, determines the accessibility of the available ICT among farmers, examines how cassava farmers perceive the adoption of ICT tools and identify the challenges faced by cassava farmers in adopting ICT tools in cassava production. Descriptive statistics and Chi-square tests were employed for data analysis. Results on socio-economic characteristics revealed a predominantly female (55.56%), literate (90%), and married (64.81%) group with an average age of 46, had an average of 27 years of cassava farming experience, engaged in small-scale farming (1.8 hectares), and had an average annual income of ₦484,000. Principal ICT tools included radio, mobile phones, television, computers, and the Internet. Mobile phones (94.44%), television (89.81%), and radio (77.78%) were reported as the most accessible tools. The rejection of the null hypothesis indicated farmers perceived ICT tool adoption as relevant. Challenges included high costs, inadequate knowledge, limited awareness, internet-related issues, power supply, low education levels, language barriers, and distrust of technology. Recommendations include targeted training, improved connectivity, and power supply.*

**KEYWORDS:** accessibility, information communication technologies, cassava farmers, Obubra, Cross River State, Nigeria

## INTRODUCTION

Cassava, a staple crop in Africa, has gained prominence due to its multi-uses and starch-rich roots. It has been transformed from a staple to a source of income and potential foreign exchange earner,

positively impacting Nigeria's economic fortune. Cassava can be processed into secondary products for industrial market value, such as chips, pellets, flour adhesives, alcohol, and starch, which are vital raw materials in the livestock feed, alcohol/ethanol, textile, confectionary, wood, food, and soft drinks industries (Olaniyi *et al.,* 2013; Aboajah *et al.,* 2018).

The use of Information and Communication Technologies (ICTs) in agriculture has been gaining popularity in Africa and Nigeria in particular. Over the last two decades, the world has witnessed an unprecedented growth in ICT applications (Babuga *et al.,* 2020). Conventional communication channels such as farm visits, personal letters, and contact farmers have been counterproductive, calling for the adoption of ICTs by researchers and extension workers to transmit relevant information efficiently. It has become necessary for all stakeholders to join hands in developing the ICT world in Nigeria since it has the potential to transform agriculture through agricultural extension in the country.

ICTs cover a wide range of equipment and services, including radio, television, mobile phones, short message services (SMS), world wide web (www), search engine, camera, video, e-mail, computer, contact data base and systems, CD-Rom, DVD, rural radio, and web publishing. Nenna (2016) opined that ICTs have great impact on productivity, product differentiation, competitive advantage, effective communication, and employment opportunities in productive sectors of the economy. Communicating information to rural cassava farmers on cassava farming inputs such as health and economic reasons, where and how to access improved cassava cuttings, the right method of planting improved cassava cuttings, how to secure agricultural loans, and access other available inputs is imperative.

However, the major task of ICTs in agricultural development is the transfer of improved technologies to end-users (farmers). There are still serious limitations in ICT application, particularly in rural areas, despite the world-wide ICT revolution. These limitations include low level of ICT readiness, poor ICT infrastructures, erratic and unstable power supply, limited and high cost of telephone services, limited access to computers and internet, lack of communication policy by government, high level of rural poverty, high level of illiteracy, policy inconsistency, and commercialization of radio stations among others.

Access refers to the ways and means by which individuals, communities, and institutions are exposed to the use of ICT. It takes into consideration elements such as affordability and availability of the technologies, the geographical location, and the access point at the times at which the technologies are available (Ekeanya, *et.al.,* 2017). Farmers in the rural area are to benefit from the use of ICT to order to improve cassava production. Olaniyi *et al.,* (2013) pointed out that there is a death of knowledge and information and new technologies in agriculture that is yet to be exploited, especially in most developing countries, including Nigeria. Access to such new information is a crucial requirement for sustainable agricultural development, especially in the cassava industry.

This study seeks to know the types and sources of ICT available to cassava farmers in Obubra LGA, Cross River State, Nigeria, and assess their ability and willingness to use ICT for their farming activities. The factors affecting the accessibility of ICT among Cassava farmers in Obubra LGA will help to improve the outcomes and impacts of ICT interventions aimed at improving agricultural information and knowledge management. Consequently, the specific objectives are to:

i. describe the socio-economic factors of the cassava farmers in Obubra LGA.
ii.
iii. identify the available ICT tools to cassava farmers in the area.
iv. determine the accessibility of the available ICT among farmers in the area.
v. examine how cassava farmers perceived the adoption of ICT tools in cassava production.
vi. identify the challenges faced by cassava farmers in adopting ICT tools in cassava production in the area.

The null hypothesis to be tested: $H_{0i}$: cassava farmers do not significantly access the available ICT tools for cassava production in the study area.

## METHODOLOGY

This study was carried out in Obubra Local Government Area in Cross River State. According to the local government news magazine (2022), Obubra has a population of 262,800 and occupies a land mass of 1086 km². Obubra lies between latitude 6.0820°N and longitude 8.3278° E. It is bounded by Yala and Ikom in the North, Yakurr and Akamkpa Local Government Area in the south and east, respectively, and Ebonyi state in the west (Mfam, 2002). Obubra LGA is made up of 11 council wards delineated into 5 clans: Adun, Okum, Osopong, Ofumbungha, Yala. The primary occupation of the people is farming. Cassava cultivation is one of the major occupations of the farmers throughout the year. They also rear animals like West African goats and native fowl.

### Sampling technique

A multi-staged selection technique was employed in the study. The first stage involved randomly selecting three (3) clans out of the 5 clans in Obubra Local Government Area, namely Adun, Okum, and Osopong. The second stage was to randomly select three (3) villages from each of the 3 clans, namely Adun (Ofodua, Ovonum, Ababene), Okum (Ochon, Apiapum, Iyamoyong), and Osopong (Obubra urban, Ogada 1, Ofumbungha 1). In the third stage, 10% of registered cassava farmers were selected as a sample frame from ADP Obubra, and finally, 112 respondents were selected from the 9 villages using a proportionality factor of 10%. The distribution of the questionnaires was based on the total number of clans and villages, as illustrated below:"

**Table 1: Selection of respondents for the study**

| Clans | Villages | Registered Cassava Farmers | Number of Respondent |
|---|---|---|---|
| Adun | Ofodua | 130 | 13 |
| | Ovonum | 80 | 08 |
| | Ababene | 200 | 20 |
| Okum | Ochon | 160 | 16 |
| | Apiapum | 80 | 08 |
| | Iyamoyong | 120 | 12 |
| **Osopong** | Ofumbungha 1 | 100 | 10 |
| | Obubra Urban | 150 | 15 |
| | Ogada 1 | 100 | 10 |
| Total = 3 | 9 | 1120 | 112 |

**Source: ADP Office, Obubra LGA.**

The data type that was used in the conduct of the study is the primary data. Primary data was obtained basically through the use of a structured questionnaire and personal interviews.

**Analytical techniques**

The collected data were used to analyze and fulfill the objectives of the study. Accordingly, descriptive statistics such as frequency distribution and percentages were employed to achieve objectives I, II, and III.

Chi-square analysis was used to achieve objective IV, expressed as;

$$X^2 = \frac{\sum^k (O - e)^2}{e}$$

For objective V, a Likert response system was employed. A three-point Likert-type scale was used, with response options ranging from “Most frequently used” = 3, “Frequently used” = 2, to “Rarely used” = 1. The values were then summed, resulting in a total of 6, which was divided by 3 to obtain a mean score of 2.00. Mean scores of 2.00 or above were classified as 'most frequently used,' scores of 1.50-1.99 as 'frequently used,' and mean scores of 1.00-1.49 as 'rarely used.

## RESULTS AND DISCUSSION

The results on the socio-economic characteristics of the respondents are presented in Table 2. The variables considered include gender, age, marital status, household size, educational level, farming experience, farm size, and average annual income from cassava production.

From the table 2, the variable of gender reveals that 55.56% of farmers were female, while 44.44% were male, indicating a higher participation of women in cassava cultivation. Males mostly engage in yam cultivation, while females predominantly participate in cassava production. Male household heads often assist their partners in labour-intensive tasks. This aligns with previous research by Ikuemonisan *et al.,* (2020) in Nigeria, who reported a higher involvement of females in small-scale cassava farming and gardening activities in Nigeria.

The age distribution on Table 2 reveals that that 49.3% of farmers were aged 40-49, with a mean age of 46. This implies that cassava farmers in the study area belong to an economically mature age group, enabling them to contribute effectively to the productive processes. Additionally, Kuye (2016) found that most cassava farmers in Southern Nigeria were young, mature individuals capable of actively participating in cassava production.

**Table 2: Socio-economic characteristics of cassava farmers**

| Variables | Frequency | Percentages | Mean |
|---|---|---|---|
| **Gender** | | | |
| Male | 48 | 44.44 | |
| Female | 60 | 55.56 | |
| **Age** | | | |
| 20 - 29 years | 8 | 7.41 | |
| 30 - 39 years | 19 | 17.59 | |
| 40 - 49 years | 50 | 46.30 | 46 |
| 50 - 59 years | 15 | 13.89 | |
| 60 years and above | 16 | 14.81 | |
| **Marital status** | | | |
| Single | 10 | 9.26 | |
| Married | 70 | 64.81 | |
| Widowed | 17 | 15.74 | |
| Divorced | 11 | 10.19 | |
| **Educational level** | | | |
| No Schooling | 11 | 10.19 | |
| Primary education | 23 | 21.30 | |
| Secondary education | 44 | 40.74 | |
| Tertiary education | 30 | 27.78 | |
| **Farming Experience** | | | |
| 1-10 years | 4 | 3.70 | |
| 11 - 20 years | 28 | 25.93 | |
| 21 - 30 years | 40 | 37.04 | 27 |
| 31 - 40 years | 16 | 14.81 | |
| 41 years and above | 20 | 18.52 | |
| **Household Size** | | | |
| 1-5 persons | 47 | 43.52 | |
| 6-10 persons | 44 | 40.74 | 7 |
| 11 persons and above | 17 | 15.74 | |
| **Farm size** | | | |

| | | | |
|---|---|---|---|
| 0.5-1.0 ha | 47 | 43.52 | |
| 1.1-2.0ha | 39 | 36.11 | 1.8 |
| 2.1-5.0ha | 14 | 12.96 | |
| > 5 ha | 8 | 7.41 | |
| **Annual farm income (Naira)** | | | |
| < 100,000 | 23 | 21.30 | |
| 101,000 - 500,000 | 38 | 35.19 | 484,259 |
| 501,000 – 1,000,000 | 28 | 25.93 | |
| > 1,000,000 | 19 | 17.59 | |

**Source: Field data, 2023.**

The variable of marital status indicates that most of the farmers (64.81%) were married, while only 9.26% were single. This suggests that married individuals among the respondents have access to and can effectively utilize the labor that comes with having a family. These findings align with the research of Aboajah *et al.,* (2018), which reported a high proportion of married cassava farmers in their study of cassava production in Abuja, Nigeria.

The educational levels of the respondents indicate that only 10.19% of the respondents had no formal education while 40.74% attended secondary school. Approximately 90% had some form of formal education, implying that they were literate and capable of reading and writing. The level of literacy suggests that they would be able to access basic information on loans, understand training provided by extension agents, and embrace innovative practices in cassava production, including the use of ICT tools. This observation aligns with the findings of Babuga *et al.,* (2020), who reported that most farmers were literate, with educational attainment up to the tertiary level.

On the farming experience as presented in Table 2, cassava farmers in the study area have an average of 27 years of farming experience. This finding suggests that the cassava farmers in the study area possess a high level of expertise and skill. This is consistent with Sanusi *et al.,*'s (2020) research on cassava production in Kwara State, which found that farmers have accumulated a wealth of experience and knowledge over time.

Household size has a mean value of 7 persons per household. most respondents (43.52%) have a family size of 1-5 persons, while 15.74% have households with over 11 people. This suggests that respondents can utilize the labour resources available within their households for their production activities. However, it also implies an increased cost in managing relatively larger households. These findings are in alignment with those of FAOSTAT (2022), reported an average household size of 8 persons per farming household.

The variable of farm size indicates that the average farm size of the respondents is 1.8 hectares. Notably, 43.52% of respondents cultivate land in the range of 0.5 to 1 hectare, while 7.41% manage farms exceeding 5 hectares in size. These findings are consistent with the observations made by

Kuye (2016), who reported that many cassava farmers in the South-south region of Nigeria are characterized as small-scale farmers.

The farm annual income of the respondents, as displayed in Table 2, indicates that 35.19% of respondents reported an annual farm income between ₦101,000 to ₦500,000. The average annual income from cassava production stood at ₦484,259, suggesting that the majority of the farmers are producing at subsistence level with low farm income per year."

## Available ICT tools to cassava farmers in the study area

**Table 3: Awareness of respondents to ICT tools in the study area**

| ICT Tools | Frequency | Percentage | Rank |
|---|---|---|---|
| Mobile Phone | 107 | 99.07 | 1st |
| Television | 102 | 94.44 | 2nd |
| Radio | 99 | 91.67 | 3rd |
| Internet | 87 | 80.56 | 4th |
| Computer | 75 | 69.44 | 5th |

**Source: Field data, 2023.**

The findings presented in Table 3 highlight the availability of various Information and Communication Technology (ICT) tools among cassava farmers in the study area. It reveals that mobile phones are the most accessible ICT tool among cassava farmers in the study area, with 99.07% reporting access. This highlights the widespread use and accessibility of these tools in rural agricultural communities. Mobile phones provide farmers with real-time communication, allowing them to stay connected, receive agricultural information, and engage in market transactions efficiently. This agrees with Nenna (2016), reported that mobile phones are more prevalent than any other innovative device available to cassava farmers.

Television is the second most available ICT tool, with 94.44% of respondents reporting access. Television broadcasts can offer educational programs, weather forecasts, and agricultural advice, making it a valuable source of information for farmers. This aligns with the finding of FAOSTAT (2022), which reported that farmers in West Africa had access to television as a tool for information dissemination.

Radio, with 91.67% availability, is another important ICT tool. Radios are affordable sources of information for rural communities, offering agricultural programs and updates on market conditions. The Internet, with 80.56% availability, provides a wealth of information, including weather forecasts, pest and disease management strategies, and best agricultural practices. This aligns with Babuga *et al.*, (2020), who reported that the internet was steadily becoming a rapid tool for information dissemination, especially among new-generation farmers.

Computers, with 69.44% availability, are less prevalent but offer access to more comprehensive agricultural information and online research. These tools can contribute to increased productivity, sustainable practices, and better income generation within the cassava farming community. The results suggest that most respondents in the study area are well-informed about the available ICT tools, which has become more accessible due to globalization (Babuga *et al.,* 2020).

## Level of accessibility of cassava farmers to ICT tools in the study area

**Table 4: Level of accessibility of respondents to ICT tools in the study area**

| ICT Tools | Frequency | Percentage |
|---|---|---|
| Mobile phone | 102 | 94.44 |
| Television | 97 | 89.81 |
| Radio | 84 | 77.78 |
| Internet | 45 | 41.67 |
| Computer | 34 | 31.48 |

**Source: Field data, 2023.**

The findings presented in Table 4 highlight the accessibility of various ICT tools to cassava farmers in the study area. It shows that mobile phones, television, and radio are the most accessible ICT tools for cassava farmers in the study area, followed by internet (41.67%) and computers (31.48%). However, access to the internet and computers is relatively limited, possibly due to infrastructure and connectivity challenges in rural areas. This highlights the digital divide in the area, where basic communication tools are prevalent but access to advanced technologies remains a challenge for some farmers. This aligns with the FAOSTAT (2022) report on ICT utilization and cassava production in Nigeria and West Africa.

## Perceived level of adoption of ICT tools by Cassava farmers

**Table 5: Perceived level of adoption of ICT tools by cassava farmers.**

| ICT Tools | (o) | (e) | (o-e) | $(o-e)^2$ | $(o-e)^2/e$ |
|---|---|---|---|---|---|
| Mobile Phone | 92 | 74.2 | 17.8 | 316.84 | 4.27 |
| Television | 98 | 74.2 | 23.8 | 566.44 | 7.63 |
| Radio | 96 | 74.2 | 21.8 | 475.24 | 6.40 |
| Internet | 85 | 74.2 | 10.8 | 116.64 | 1.57 |
| Computer | 76 | 74.2 | 1.8 | 3.24 | 0.04 |
| CHI-SQUARE ($X^2$) | 19.91 | | | | |
| Critical value (Df = (5-1)*(3-1) = 8) | | | | 15.51 | |

**Source: Field data, 2023.**

The chi-square analysis presented in Table 5 demonstrates a strong and statistically significant association between the perceived adoption of ICT tools and the responses provided by cassava

farmers in the study area. The chi-square value (19.91) was significantly higher than the critical value (15.51), indicating a highly significant relationship ($p<0.05$) between the variables. This suggests that farmers are selective in adopting ICT tools based on their specific preferences, requirements, or challenges in cassava farming. This suggests also that interventions should be tailored to the diverse needs and preferences of cassava farmers, leading to more effective technology dissemination strategies. This study agrees with that of Nenna (2016), who reported that the level of adoption of technological innovation varies by individuals and depends on the availability of information and accessibility to these innovations.

The null hypothesis which states that cassava farmers do not significantly access the available ICT tools in cassava production in the study area is rejected. Based on the results of the $X^2$-test as presented in Table 5, a significant relationship ($p<0.05$) exists between access to ICT components and adoption by cassava farmers in the study area.

**Challenges faced by casaba farmers in ICT tools adoption**.

**Table 6 Constraints to ICT tools adoption by farmers in the study area**

| Constraints | SA | A | D | SD | Mean | Remark |
|---|---|---|---|---|---|---|
| Inadequate knowledge or training on how to use the tools | 46 | 52 | 8 | 2 | 3.31 | Severe |
| High cost of tools and services | 49 | 37 | 12 | 10 | 3.16 | Severe |
| Inadequate Power supply | 32 | 62 | 4 | 10 | 3.07 | Severe |
| Fear or distrust of technology | 40 | 41 | 21 | 6 | 3.06 | Severe |
| Lack of awareness on the new and available ICT tools for agriculture | 39 | 44 | 15 | 10 | 3.04 | Severe |
| Lack or internet connection or internet enabled devices | 38 | 49 | 19 | 9 | 3.01 | Severe |
| Low level of education of the farmers | 36 | 38 | 24 | 10 | 2.93 | Somewhat Severe |
| Language barrier | 29 | 26 | 44 | 9 | 2.69 | Somewhat Severe |

**Source: Field data, 2023.**

The result in Table 6 present the constraints faced by farmers in the study area regarding the adoption of ICT tools. Inadequate knowledge and training on how to effectively use ICT tools is a substantial constraint with a mean value of 3.31. This implies that even if ICT tools are accessible, farmers may not be aware of their full potential or how to navigate them for agricultural purposes.

The high cost of tools and services had a mean value of 3.16. High costs can deter farmers from acquiring ICT devices and services. It encompasses not only the initial cost of purchasing devices like smartphones, computers, or internet connectivity but also the ongoing expenses associated with data plans and maintenance.

Inadequate power supply is another severe constraint with a mean value of 3.07. Reliable electricity is essential for charging devices and using ICT tools effectively. In areas with inconsistent or inadequate power supply, farmers may face challenges in keeping their devices operational. Alternative power sources, such as solar energy, could provide a solution in regions with unreliable electricity.

Fear or distrust of technology (mean value of 3.06) reflects a psychological barrier. Farmers may be hesitant to embrace technology due to fear or distrust. This fear can stem from concerns about the complexity of technology, perceived risks, or skepticism about its benefits. Building trust in ICT tools and addressing these concerns is essential to encourage adoption.

Lack of awareness about new and available ICT is a severe constraint with a mean value of 3.04. The level of awareness among farmers about the existence and utility of various ICT tools is crucial. If farmers are not aware of what tools are available and how these tools can improve their farming practices, they are unlikely to adopt them. Awareness campaigns and information dissemination are needed to address this constraint.

Access to the internet is a fundamental requirement for many ICT tools, especially those that rely on real-time data and information. The lack of internet connectivity (3.01) and compatible devices can limit the usefulness of these tools. Infrastructure development, such as expanding network coverage and subsidizing data costs, may be necessary to address this constraint.

Other constraints to ICT utilization by the respondents include the low level of education of the farmers (mean value of 2.93) and language barrier with a mean value of 2.69. Understanding and addressing these constraints can enhance the successful integration of ICT into agricultural practices, potentially leading to increased productivity and improved livelihoods for farmers in the study area. Ekanem and Ekerete (2016), in their study, reported similar findings and noted that due to economic factors in rural areas, most ICT tools are only available but not utilized or accessible to smallholder farmers.

## CONCLUSION AND RECOMMENDATION

The study concluded that mobile phones were the most prevalent and accessible among cassava farmers in the study area. This underscores the potential of mobile technology for disseminating agricultural information and services. The rejection of the null hypothesis confirmed that cassava farmers in the area perceived the adoption of ICT tools as relevant to their agricultural activities. Considering these findings, it is evident that promoting the use of ICT tools in cassava farming could yield substantial benefits, given the farmers' willingness to adopt such technologies.

Based on the conclusion drawn, the following recommendations are made:

i. Targeted training and extension programs should be developed and implemented to enhance farmers' knowledge and skills in effectively using ICT tools for cassava production.
ii. Internet connectivity and power supply should be improved to ensure that farmers can access online resources and utilize ICT tools without disruptions.
iii. Collaborations among government, NGO's, academic institutions, and private sector entities should be fostered to create a supportive ecosystem for ICT adoption in agriculture, offering training, technical support, and access to affordable technology.
iv. The possibility of providing incentives or subsidies for farmers who actively and effectively adopt ICT tools in their cassava production should be explored. These incentives could include preferential access to credit or inputs.
v. Cassava farmers should be encouraged to form or join cooperatives or associations, which can facilitate collective access to ICT resources, training, and support.

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