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Utilization of Information Communication Technologies for Agricultural Marketing and Constraints among Youths in Oyo State, Nigeria

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Abstract*— This study investigated the utilization of Information Communication Technologies (ICTs) for agricultural marketing among Youths in Oyo State, Nigeria. It examined respondents' socio-economic characteristics, awareness, utilization, and perceptions of ICTs, sources of agricultural marketing information, and constraints to effective ICT usage. Using a simple random sampling technique, data were collected from 84 respondents through structured questionnaires and analyzed using descriptive and inferential statistics. The results revealed that most respondents (66.7%) were aged 40–49, predominantly male (58.3%), married (79.8%), and educated up to secondary level (73.8%). Over half (56%) earned annual incomes between ₦300,000–₦499,000, with marketing experience ranging from 10–12 years (57.1%). Mobile phones (94.1%) were the most utilized ICT tool, internet (23.8%) and social media (19%) were less frequently used. The study highlighted followed by radio (76.2%) and television (53.6%). However, moderate awareness (71.5%) and utilization (51.2%) levels of ICTs for agricultural marketing. Constraints included irregular power supply (95.2%), poor network service (92.9%), high data costs, and technical challenges. Chi-square and correlation analyses indicated significant relationships between ICT utilization and factors like education, produce type, buyers, age, household size, income, and perception. The study therefore recommends prioritizing rural electrification, reducing data costs, employing more extension agents, and promoting adult education to enhance ICT utilization for agricultural marketing.

***Keywords*— Utilization, Agricultural Marketing, Youth Farmers, Technology Awareness, Market Access**

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I. INTRODUCTION

In Nigeria, Youths account for a significant proportion of the population, comprising about 70% of the total population, according to the National Bureau of Statistics [1] . The population of Nigeria is estimated to be 239 million by the end of 2025 and 440 million by 2050 [2]. The unemployment rate among Nigerian youth remains alarmingly high, reaching approximately 42.5% in 2023 [3]. As defined in Nigeria's National Youth Policy [4], youths include individuals aged 18 to 35 years. The agricultural

sector is a crucial tool in economic development and food security in Nigeria. However, the ageing labour force negatively affects the total factor productivity in agriculture by inhibiting technological progress [5]. The future of food security and sustainable agriculture relies on the involvement of young people [6]. Despite their potential to contribute significantly to economic development, Nigerian youths face numerous challenges in agriculture, including limited access to information that improves productive resources [7]. These barriers often discourage youths' participation in agriculture, leading many to migrate to urban areas for better-paying jobs. This rural-urban migration has contributed to a rise in social issues, including unemployment, crime, and substance abuse [8].

In recent years, there has been an increased emphasis on the role of youth in driving agricultural transformation in Nigeria, aligning with global efforts to empower youth as catalysts for economic growth [9]. The Nigerian government has introduced various strategies and initiatives to address youth challenges and encourage their participation in agriculture. Key programs include the Youth Employment in Agriculture Programme (YEAP), N-Power Agro, and the Nigerian Youth Investment Fund (NYIF), aimed at reducing youth unemployment and improving economic prospects. There is limited evidence of how funds from these programs are allocated to farming activities, although it has been observed that despite the access to such funds, many youths still face structural and systemic barriers which hinder their engagement in agricultural ventures [10]. Despite the creation of these programs, the policy has not adequately addressed the specific concerns relevant to youths in Agriculture [7]. To bridge the heterogeneity among the youth, it is advisable to promote targeted policies that focus on youth-oriented agricultural development and foster their long-term participation [11].

Information and Communication Technologies (ICTs) are crucial for economic transformation, particularly in agriculture [12]. In agriculture, ICTs facilitate market information dissemination, improve supply chain management, and enhance decision-making among farmers [13]. The emergence of digital agriculture has drawn young people to the sector, providing them with opportunities to generate income, and tackle issues such as accessing markets and value addition [14].

In Nigeria, agriculture is largely dominated by smallholders who rely on traditional farming methods, resulting in low productivity and inefficient market systems [15]. Other critical disadvantages of traditional farming methods are limited access to credit and resources, significant post-harvest losses and underutilization of land [16], [17]. The sector faces critical challenges, including a lack of value chain integration, minimal youth participation, and limited adoption of modern technologies, all of which contribute to enduring poverty and high unemployment rates. In addition, more post-harvest losses are recorded, and bargaining power is reduced when there is restricted access to markets and information.

Several researchers have exhibited a favorable perception of using information communication technology tools for agricultural marketing. [14] investigated the use of such tools, particularly social media in marketing agricultural products in South-South Nigeria. A study by [18] explored how mobile phones facilitate agricultural marketing, especially in rural areas. The study concluded that mobile phones reduce market inefficiencies by improving price transparency and access to market information in Niger. [19] analyzed the role of social media in empowering youth farmers, focusing on how platforms like Facebook and WhatsApp enhance agricultural marketing in Pakistan. [20] investigated using ICT tools such as mobile phones and radio to improve agricultural marketing among Youth in Abia State, Nigeria. [21] explored the potential of enhancing agricultural information and services dissemination to smallholder farmers through ICTs and highlighted gaps in their development and deployment in sub-Saharan Africa. Five existing mobile applications used to disseminate agricultural information and services to smallholder farmers were identified.

ICTs have the potential to bridge these gaps by providing timely market data, eliminating intermediaries, and improving farmers' negotiation power [22]. However, barriers such as inadequate infrastructure, poor ICT literacy, inconsistent power supply, and high data costs impede ICT adoption in rural areas [23]. Addressing these issues requires a holistic approach to integrating ICT into agricultural marketing strategies. Therefore, this study investigated the awareness of ICTs used for marketing agricultural produce among the youth; the level of utilization of ICTs for agricultural marketing in the study area and the constraint to effective utilization of information and communication technology for agricultural marketing among the youth.

A. Hypothesis of the Study

H01: There is no significant relationship between respondents' socioeconomic characteristics and utilization of information and communication technology for agricultural marketing among youth.

B. Theoretical Framework

This study adopted the use of the Technology Acceptance Model (TAM) developed by Davis (1989). It explains how users accept and use a technology based on two key determinants. This theory was specifically chosen in the development of the research instrument because it helps to understand how youths adopt ICTs for agricultural marketing. When applied to the utilization of ICTs for agricultural marketing among youths, it offers valuable insights into factors influencing their adoption of ICT tools and platforms. The theory suggests that an individual adopts a technology to the degree he believes that it would enhance his job performance (Perceived usefulness) and to the degree that using a technology will be free of effort (Perceived ease of use). Relevant to this study, youths are likely to adopt ICTs like mobile apps, social media and market places if they perceive these tools to increase market

access, provide real-time price information and enhance income by connecting directly with buyers. Also, user-friendly ICT platforms with intuitive interfaces, localized language options, and minimal technical requirements are more appealing to youth.

If youths perceive ICTs as enhancing their access to broader markets (Perceived usefulness) and find tools like mobile payment systems easy to use (Perceived Ease of Use), their intention to adopt these technologies increases. A study by [24] found that young farmers in Kenya adopted digital platforms like Facebook and Twitter because they simplified product marketing and customer engagement. ICTs enable youths to access agricultural knowledge (e.g., best practices, and market trends). If these tools are intuitive and provide significant value, youths are more inclined to use them. [25] demonstrated that mobile phones enhanced agricultural knowledge sharing among Nigerian youths, highlighting both perceived usefulness and perceived ease of use. ICTs reduce marketing costs by eliminating intermediaries and allowing direct interaction with buyers. According to [26], Tanzanian youths adopted mobile platforms for agricultural transactions due to cost-effectiveness and ease of use. This has hitherto greatly aided in designing and implementing ICT tools that cater to youths' needs, thereby enhancing their market participation and economic outcomes. Also, the use of mobile phones has gained ground in Ghana for the delivery of agricultural-related information [27]. Moreover, it has equally aided in encapsulating the severity of constraints faced by youths in rural areas who may struggle with limited ICT infrastructure.

II. METHODOLOGY

A. Description of Study Area

The study was carried out in the Akinyele local government area of Oyo state in Nigeria, with coordinates between latitudes 70 29' and 70 400 of the equator and longitudes 30 45' and 40 40' of the prime meridian. Akinyele local government area was created in 1976 and it is one of the local governments constituting the Ibadan metropolis. It is bounded in the east by the Lagelu Local Government Area, by the Afijio Local Government Area in the North, by the Ibadan North Local Government Area in the South, and in the West by the Ido Local Government Area. It occupies a land area of 464.82km^2 with an estimated population of 297,600 people. The prestigious International Institute of Tropical Agriculture (IITA) and the Nigerian Institute of Social and Economic Research (NISER) are based in Akinyele Local Government.

B. Sampling Technique

The population of this study consisted of the youth farmers in Akinyele Local Government Area of Oyo State. A three-stage sampling technique was employed to select the sample for the study. In the first stage, the Akindele local government was purposefully chosen because the youth are involved in agricultural production there. In the second stage, out of the 12 wards and 30 villages, seven (7) wards and (3) villages from the selected ward were randomly sampled, amounting to a total of twenty-one (21) villages. In the third stage, 4 registered farmers were selected from each village, which will amount to a total of eighty-four (84) respondents. Questionnaires were to gather data because most farmers have low levels of education. The study consisted of two variables namely, independent and dependent variables. Utilization of ICT in marketing agricultural produce among youth is the dependent variable, and it will be assessed by the youth in Agriculture. Level of awareness of respondents to information communication technology for agricultural marketing. The various ICTs were listed and the level of awareness will be measured on a 3-point rating scale of high, moderate, and low. Frequency of utilization of information communication technology for agricultural marketing. The various ICTs were listed and the frequency level was measured on a 5-point rating scale of always, sometimes, occasionally, rarely, and never. The constraints to the effective utilization of information and communication technology for agricultural marketing were measured by listing the possible constraints to the utilization of ICTs. This was measured on a 3-point rating scale of major constraint, minor constraint, and not a constraint. The data for this study were analyzed using both descriptive and inferential statistical analytical tools. The descriptive statistical tools used include frequency, count, percentages, and mean, while the inferential statistical tools used in testing the stated hypotheses are Chi-square and Pearson's Product Moment Correlation analysis.

III. RESULTS AND DISCUSSION

Level of awareness of the utilization of ICTs for marketing agricultural produce

Table 1 shows that the majority (71.5%) of the respondents indicated that their level of awareness of the utilization of ICTs for marketing agricultural produce is moderate while 21.4% of the respondents indicated that their level of awareness of utilization of ICTs for marketing agricultural produce is high and 7.1% of the respondents indicated that their level of awareness of utilization of ICTs for marketing agricultural produce is low. This implies that the respondents have some level of awareness of the utilization of ICTs for marketing agricultural produce. This finding is supported by [28], who reported that youth farmers are aware of the use of ICTs in agricultural marketing.

TABLE 1: CATEGORIZATION OF RESPONDENTS BY LEVEL OF ICTS AWARENESS

Level of awareness of ICTs	Frequency	Percentage
High	18	21.4
Moderate	60	71.5
Low	6	7.1
Total	84	100

Source: Field Survey, 2022

Frequency of Utilization of ICT for Agricultural Marketing

Table 2 shows that 94.1% of the respondents indicated always the utilization of mobile phones while 76.2% indicated always to radio and 53.6% for television. Also, 23.8% indicated the Internet, and 19% indicated social media. On the other side, 32.1% indicated social media sometimes, 31% indicated internet sometimes, 27.4% indicated television and 9.5% radio. 19% indicated social media occasionally, 15.5% indicated internet occasionally, 8.3% indicated television occasionally and 6% indicated radio occasionally. 10.7% indicated internet and social media rarely, 7.1% indicated radio rarely and 3.6% indicated television. 19% indicated never for internet and social media, 7.1% indicated never for television, 6% indicated never for mobile phone and 1.2% indicated never for radio. The findings indicated that the majority of the respondents make use of ICTs for the marketing of agricultural produce but at different frequencies.

TABLE 2: DISTRIBUTION OF RESPONDENTS BY FREQUENCY OF UTILIZATION OF ICTS

ICT Types	Always	Sometimes	Occasional	Rarely	Never
Radio	64	8	5	6	1
Television	45	23	7	3	6
Mobile Phone	79	-	-	-	5
Internet	20	26	13	9	16
Social media	16	27	16	9	16

Source: Field Survey, 2022

Categorization of respondents by frequency of utilization of ICTs for marketing of agricultural produce

The result in Table 3 shows that 51.2% of the respondents have a moderate level of ICT utilization for marketing of agricultural produce, 34.5% have a high level of ICTs utilization was high and 14.3% of respondents have a low level of ICTs utilization. The findings indicated that the majority (100%) of the respondents make use of ICTs for marketing agricultural produce but at different levels. This also supports the report of [28] that the majority of the respondents utilized ICTs moderately.

TABLE 3: CATEGORIZATION OF RESPONDENTS BY LEVEL OF UTILIZATION OF ICTS

Level of utilization	Frequency	Percentage
High	29	34.5
Moderate	43	51.2
Low	12	14.3
Total	84	100

Source: Field Survey, 2022

Constraints to effective utilization of information and communication technology for agricultural marketing

Table 4 shows that 95.2% of the respondents indicated irregular power supply and lack of technical know-how are the constraint types, while 92.9% indicated poor network service and high cost of data. The findings indicate that the listed constraint types were experienced in the study area. This also supports the findings of [29] who reported that cost is a major restraint in the utilization of ICTs in agriculture.

TABLE 4: DISTRIBUTION OF RESPONDENTS BY CONSTRAINT TYPES

Constraint types	Frequency	Percentage
Irregular power supply	80	95.2
Poor network service	78	92.9
Lack of technical know-how	80	95.2
High cost of data	78	92.9

Source: Field Survey, 2022

Constraint severity

Table 5 shows that 53.6% of the respondents indicated a very severe level of constraint type while 32.1% indicated severe. Also, 9.5% indicated the most severe and 4.8% indicated no response. This implies that the majority of constraints are severe in the study area.

TABLE 5: DISTRIBUTION OF RESPONDENT BY CONSTRAINT SEVERITY

Constraint severity	Frequency	Percentage
Very severe	45	53.6
Severe	27	32.1
Most severe	8	9.5
No response	4	4.8
Total	84	100

Source: Field Survey, 2022

Level of severity

Table 6 shows that 59.5% of the respondents indicated a high level of severity on the use of information and communication technology for agricultural marketing. In comparison, 28.6% indicated a moderate level of severity on the use of information and communication technology for agricultural marketing. Also, 7.1% indicated low severity on the use of information and communication technology for agrarian marketing and 4.8% had no response on the level of severity on the use of information and communication technology for agricultural marketing.

TABLE 6: DISTRIBUTION OF BY LEVEL OF CONSTRAINT SEVERITY

Level of severity	Frequency	Percentage
High	50	59.5
Moderate	24	28.6
Low	6	7.1
No response	4	4.8
Total	84	100

Source: Field Survey, 2022

Hypotheses testing

H01: There is no significant relationship between respondents' socioeconomic characteristics and use of information and communication technology

Table 7 shows that age (r=*-0.521), household size (r=0.585), years spent schooling (r=0.598), annual income (r=**0.138) and marketing experience (r=0.174) have a significant relationship on utilization of ICT for agricultural marketing. This indicates that the above-mentioned socioeconomic characteristics have a positive effect on the utilization of ICT for agricultural marketing among youth hence an increase or change in one or all the variables will bring about an increase in the level of income or profit of the marketers. This also supports the report of [30] which says from the results, age, marital status, transport cost, distance to the market, land size, number of agricultural value chain stages (a youth participates in) and access to extension services significantly influence the intensity of ICT use in agricultural value chains. Age has an inverse relationship to the extent of use of ICT tools, implying that younger farmers are more receptive to new ideas and innovations compared to older ones. They are more likely to use ICT tools to seek information on production, marketing, access to extension, and transportation services. Therefore, the initial hypothesis which says that there is no significant relationship between respondents' socioeconomic characteristics and utilization of information and communication technology for agricultural marketing among youth is hereby rejected and the alternate hypothesis which says that there is a significant relationship between respondents' socioeconomic characteristics and utilization of information and communication technology for agricultural marketing among youth is hereby accepted.

TABLE 7: CORRELATION ANALYSIS OF RELATIONSHIP BETWEEN RESPONDENTS' SOCIOECONOMIC CHARACTERISTICS AND UTILIZATION OF INFORMATION AND COMMUNICATION TECHNOLOGY FOR AGRICULTURAL MARKETING AMONG YOUTH

Socioeconomic characteristics	Correlation coefficient	Decision
Age	*-0.521	S
Household	0.585	S
Years of schooling	0.598	S
Annual income	**0.138	S
Marketing experience	0.174	S

*correlation at 5% level of significance, ** correlation at 1% level of significance

IV. CONCLUSION OF THE FINDINGS

This study examined the awareness, frequency of utilizing ICTs among youth and assess the constraints that limit their access and use of ICTs in marketing agricultural products

Data were collected using structured questionnaire. The analysis revealed that respondents have some awareness of the utilization of ICTs for marketing agricultural produce but with variation in their frequencies which may be due to the respondent level of ICTs utilization and the different types of ICTs available in the study area including radio, television, mobile phone, internet, and social media while constraint identified were irregular power supply, lack of technical know-how, poor network service and high cost of data. Age, household size, years spent schooling, annual income and marketing experience influenced the use of ICT for agricultural marketing. Based on the findings of the study, it is recommended that there is a need to make electrification a priority for the government and other stakeholders as this will enhance the adequate distribution of information through the use of mobile phones, the internet and social media. The telecommunication industries should see to the reduction of the cost of data so that agricultural marketers can be able to afford it. The government should employ more extension agents to bridge the existing gaps in the extension agents-agricultural marketers' ratio.

Plain Language Summary

This study explored how young farmers in Akinyele, Oyo State, Nigeria, use technology like mobile phones, radio, and the internet for selling their farm products. Most farmers were middle-aged, married, and educated, with mobile phones being the most commonly used tool. However, internet and social media use was limited. Poor electricity, high data costs, and lack of technical skills made using technology difficult. Factors like education, age, income, and type of produce affected technology usage. The study recommends improving electricity, reducing internet costs, hiring more agricultural advisors, and offering adult education. These changes could help farmers use technology more effectively to boost their sales and income.

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Data Availability Statement

The data that has been used is confidential.

Authors Contribution

The authors contributed to the preparation of the methodology, collecting and analyzing the data. All authors contributed to the conceptualization, design, writing and editing of the article, read, reread and approved the final paper and agreed to the published version of the manuscript.

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