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Related Softwares for Improved Agricultural
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Iseyin Local Government Area of Oyo State**

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Awareness Level of Farmers on Agricultural Related Softwares for Improved Agricultural Production: Panacea for Food Insecurity in Iseyin Local Government Area of Oyo State



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Abstract

Purpose: The study in its main objective assessed the awareness level of farmers on agricultural related softwares for improved agricultural production in Iseyin Local Government Area, Oyo State, Nigeria. Specifically, the study examined the socio-economic characteristics of respondents; evaluated the level of awareness on agricultural softwares in the study area; investigated the extent of factors influencing usage of agricultural related softwares; assessed the severity of various challenges to usage of agricultural related softwares. The research hypothesis examined significant relationship between the socio-economic characteristics of the respondents and their level of awareness of farmers on agricultural related softwares available to the respondents.

Materials and Methods: A well-structured interview schedule was used to collect primary data. A total of 75 respondents were selected. Both descriptive statistics and inferential statistical analysis were employed in data analysis.

Findings: The study revealed that male (64.0%) population is more than population of female (36.0%) in the study area. Results further revealed that aside automated poultry machine, weather forecasting tools was the most aware agricultural softwares in the study area. The study also deduced that factors influencing usage of agricultural softwares was access to technology with highest

frequency of 97.3%. Limited digital infrastructure, regulatory and policy issues, reliability and connectivity issues and awareness and perception was ranked 1st in the challenges facing the respondents to usage agricultural related softwares. Chi-square analysis revealed a significant relationship between socio-economic characteristics of sex ($x^2 = 5.88$, $p = 0.015$), religion ($x^2 = 26.16$, $p = 0.000002$), marital status ($x^2 = 184.94$, $p = 0.00001$), secondary occupation ($x^2 = 45.02$, $p = 0.001$), year of farming experience ($x^2 = 6.72$, $p = 0.035$) and aspect of farming enterprise ($x^2 = 174.54$, $p = 0.001$) meanwhile, educational status do not to have a significant relationship on the awareness level of farmers on agricultural related softwares.

Implications to Theory, Practice and Policy: The study recommended improved awareness of less-known agricultural softwares like precision agronomy and data management tools through targeted educational campaigns and demonstrations that highlight their benefits to farmers, addressing regulatory and policy barriers will be crucial, along with promoting digital literacy programs to increase farmers understanding and perceived benefits of using agricultural related softwares.

Keywords: Awareness, Farmers, Agricultural Related Software, Food Security, Improved Agricultural Production

1.0 INTRODUCTION

The agricultural sector is foundational to global economy providing essential sustenance and raw materials. Traditionally, agriculture has been labor-intensive and heavily dependent on natural conditions however technological advancements have revolutionized various sectors including agriculture enhancing efficiency productivity and sustainability (Adeyemo⁴⁵² et al 2024) Agricultural softwares are significant components of agricultural technology agric-tech encompasses applications that optimize multiple facets of farming from crop management to market access these tools are critical in meeting the growing global demand for food which are expected to increase by 70% by 2050. (FAO 2019).

The adoption of agricultural softwares signify a shift towards sophistication in farming practices. precision agriculture enabled by these technologies allows efficient resource use minimizing waste and maximizing yield variable rate technology. A report by the World Bank (2017) titled "Digital Dividends in Agriculture" examines the role of digital technologies in transforming agricultural value chains and empowering small holder farmers. The report emphasizes the importance of building digital infrastructure promoting digital literacy and fostering public-private partnerships to drive innovation and adoption of agricultural softwares. Meanwhile, Qureshi, et al., (2016) provide insights into the factors influencing farmers' adoption of agricultural technologies including softwares applications. The research identifies key factors such as perceived usefulness, ease of use, access to support services and socio-economic characteristics of farmers. Understanding these factors is essential for designing effective interventions to promote technology adoption and enhance agricultural productivity.

Initiatives such as the ICT for agriculture program implemented by the Food and Agriculture Organization (FAO) of the united nation offer practical examples of how ICT solutions can address specific challenges faced by farmers in accessing information markets and advisory services. By showcasing successful case studies and best practices, these initiatives provide valuable lessons for policymakers, practitioners and technology developers seeking to promote the uptake of agricultural softwares.

This study aims to assess the current awareness levels of farmers regarding agricultural softwares, evaluate its impact on productivity and identify barriers to adoption ultimately contributing to the broader effort of ensuring global food security and sustainable agricultural development. By integrating insights from these sources into the research framework it is possible to build a robust theoretical foundation and contextual understanding of the dynamics shaping technology adoption in agriculture this interdisciplinary approach not only enriches the research findings but also informs the development of targeted strategies and policy recommendations aimed at accelerating the adoption of agricultural softwares among farmers in Iseyin Local Government Area.

Statement of the Problem

Despite the potential benefits associated with the use of agricultural-related softwares in improving agricultural production there is limited information regarding the awareness level of farmers in Iseyin Local Government Area, Oyo State on these technologies. This study seeks to address this gap by assessing the extent to which farmers in the study area are aware of agricultural-related softwares and the factors that influence their adoption to enhance agricultural productivity in a quest to guarantee food security. Iseyin having a high concentration of farmers being one of the major food basket regions in the country deserves to be a study area on issues bothering on agricultural-related softwares the gap in knowledge prompts the need for a study to evaluate the extent of farmers awareness of such softwares and the factors influencing their adoption in essence the problem statement underscores the

importance of understanding farmers knowledge on agricultural softwares in order to develop strategies that promote its adoption and maximize its potential benefits in the region. This research therefore designed to achieve the following objectives:

- i. To examine the socio-economic characteristics of the respondents in Iseyin Local Government Area.
- ii. To evaluate the level of awareness of respondents about available agricultural related softwares.
- iii. To examine various factors influencing adoption and usage of agricultural related softwares for improved agricultural productivity.
- iv. To assess the severity of various challenges to usage of agricultural related softwares

Research Hypothesis

Null hypothesis (H₀): There is no significant relationship between socio-economic characteristics of respondents and factors influencing adoption and usage of agricultural softwares tools among farmers in Iseyin Local Government Area of Oyo state.

2.0 MATERIALS AND METHODS

The study was carried out in Iseyin Local Government Area of Oyo State with farmers from the area as respondents. A multistage sampling technique was used for selection of the respondents. The first stage was purposive selection of 25% of cells in the local government based on high prevalence of agric-related softwares.

The 25% selected cells include; Isalu II, Ekunle II, Faramola, Isalu II cell has the following village (Agbede Idi Emi, Ibilekan, Okiri). Ekunle II cell has the following village (Sirafu, Abaa) Faramora cell has the following village (Gbangbala, Gbokoyi)/

The second stage was simple random sampling techniques to select from the list of farmers in the selected cells. Furthermore, 25% of the total population of the farmer in each of selected wards was considered for the study. Consequently, 40 respondents were chosen in Isalu II, 15 respondents were chosen in Ekunle II, 20 respondents were chosen in Faramora. Therefore a total number of 75 respondents were sampled for the study.

Table 1: Sample frame for the study

Local Government	Cells in Iseyin Local Government	25% Selected cells	Villages under the 25% Selected cells	Registered Farmers in selected cells	No of Respondents (25% from each cells)
Iseyin	Ado-awaye Ijemba/Oke-Ola/Oke-Oja Koso I Koso II Ladogan oke eyin, Ekunle I Ekunle II Faramola Okeho-Ayetoro Oja-Oba Oke-Afin	Isalu II	Agbede Idi Emi, Ibilekan, Okiri,	160	40
		Ekunle II	Sirafu, Abaa	60	15
		Faramola	Gbangbala, Gbokoyi	80	20
					75 Respondents

3.0 FINDINGS

Socio-economic Characteristics of Respondents

The result in Table 2 describes the socio-economic characteristics of the respondents and it reveals the mean age of the respondents as 42years which depicts a relatively youthful distribution that may enhance the propensity for adoption of technological innovations. The results also revealed majority (64.0%) of the respondents to be male with Islamic faith (56.0%). Greater number (82.0%) are married with larger chunk of the respondents being moderately educated keeping and moderate household of five individuals on the average. Also, results indicated that majority (81.3%) are into crop cultivation with an average of ten years experience as against animal husbandry (10.7%) and agro-processing (8.0%). Result further revealed a moderate digital literacy level among respondent laying credence to tendency of respondents' probable readiness to take on available opportunity for sophistication in their agricultural productions.

Table 2: Distribution of Respondents According to Socio-Economic Characteristics

Socio – Economic Characteristic	Frequency	Percentage	Mean
Age			
≤ 30	8	10.6	42years
31 – 40	29	38.7	
41 – 60	34	45.2	
≥ 61	4	5.2	
Sex			
Male	48	64.0	
Female	27	36.0	
Religion			
Christian	27	36.0	
Islam	42	56.0	
Traditional	6	8.0	
Marital status			
Single	6	8.0	
Married	62	82.7	
Divorced	7	8.3	
Education status			
No formal education	17	22.7	
Primary education	12	16.0	
Secondary education	25	33.3	
Tertiary education	21	28.0	
Household size			
≤ 5	47	62.8	
6 – 10	23	30.7	5 individuals
11 and above	5	6.7	
Years of farming experience			
≤ 10	33	43.9	
11 – 20	27	35.9	10years
>20	15	19.9	
Area of faming enterprise			
Crop Cultivation	61	81.3	
Animal Husbandry	8	10.7	
Agro-processing	6	8.0	
Secondary occupation			
Civil service	8	10.7	
Trading	66	88.0	
Agro-processing	1	1.3	
Level of digital literacy			
High	5	6.7	
Moderate	34	45.3	
Low	36	48.0	

Source: Field Survey, 2024

Respondents According to Awareness of Agricultural Softwares in the Study Area

According to results on Table 3, the level of respondents’ awareness of various agricultural related softwares revealed that genetic modification software with weighted mean score 0.68 ranked the software with most awareness among the respondents, this is followed by weather forecasting tool with weighted mean score 0.37, next in rank is geographic information system

and surveillance tool with weighted mean score 0.17. The study further identified meteorological devices, soil testing tools, automated irrigation remote sensing tools and automated poultry device in that order.

Table 3: Distribution of Respondents According to Awareness of Agricultural Softwares in the Study Area

Agricultural Related Softwares	Highly aware F (%)	Moderately Aware F (%)	Not aware F (%)	Weighted Mean Score	Rank
Genetic modification devices	12 (16.0)	27 (36.0)	36 (48.0)	0.68	1 st
Precision agronomy and data management tools	0 (0.0)	4 (5.3)	71(94.7)	0.05	8 th
Pest and diseases detection softwares	0 (0.0)	5 (6.7)	70 (93.3)	0.06	7 th
Remote sensing and satellite imagery tools	0 (0.0)	5 (6.7)	70 (93.3)	0.06	7 th
Meteorological devices	0 (0.0)	12 (16.0)	63 (84.0)	0.16	4 th
Soil testing and analysis tools	0 (0.0)	9 (12.0)	66 (88.0)	0.12	5 th
Weather forecasting tools	1 (1.3)	26 (34.7)	48 (64.0)	0.37	2 nd
GIS/surveillance softwares	0 (0.0)	13 (17.3)	62 (82.7)	0.17	3 rd
Automated irrigation devices	1 (1.3)	5 (6.7)	69 (92.0)	0.09	6 th
Automated poultry feed machine	0 (0.0)	2 (2.7)	73 (97.3)	0.02	9 th

Source: Field Survey, 2024

Figures in parentheses are percentages

Extents of Factors Influencing the Usage of Agricultural Softwares for Improved Agricultural Productivity by the Respondents

Results in Table 4 reveals the factors that influence usage of various agricultural related softwares for an improved agricultural productivity and it was revealed that access to software with weighted mean score 1.94 ranked first, this is followed by availability of training and technical support on the usage of software with weighted mean score of 1.92, next is safety and risk factors on the usage of software with weighted mean score of 1.90. Other factors in descending order are: trust and reliability of software (1.89), cost and affordability (1.88), feedback by previous users of the software (1.88), user interface and ease of usage (1.85), awareness and knowledge about the software (1.84) and least considered factor being perceived benefit from usage of software.

Table 4: Distribution of Respondents According to the Extents of Factors Influencing the Usage of Agricultural Softwares by the Respondents for Improved Agricultural Productivity

Factors	High extent F (%)	Moderate extent F (%)	Not a factor F (%)	Weighted Mean Score	Rank
Awareness and knowledge about softwares.	65 (86.7)	8 (10.7)	2 (2.7)	1.84	7 th
Perceived benefit	56 (74.7)	16 (21.3)	3 (4.0)	1.71	8 th
Risk perception	70 (93.3)	1 (1.3)	4 (5.3)	1.88	5 th
User interface and ease of usage	68 (90.7)	3 (4.0)	4 (5.3)	1.85	6 th
Trust and reliability of tools	69 (92.0)	4 (5.3)	2 (2.7)	1.89	4 th
Safety and risk factors on the softwares	69 (92.0)	5 (6.7)	1 (1.3)	1.90	3 rd
Cost and affordability of the softwares	67 (89.3)	7 (9.3)	1 (1.3)	1.88	5 th
Feedback from previous users	68 (90.7)	5 (6.7)	2 (2.7)	1.88	5 th
Training and support compatibility	70 (93.3)	4 (5.3)	1 (1.3)	1.92	2 nd
Access to technology	73 (97.3)	0 (0.0)	2 (2.7)	1.94	1 st

Source: Field Survey, 2024

Severity of Various Challenges to Usage of Agricultural Softwares in the Study Area

The study further assessed the severity of various challenges to usage of agricultural related softwares for improved agricultural productivity and was revealed that limited digital infrastructure, awareness and perception of software, reliability and connectivity and regulatory policy issues on software with weighted mean scores of 2.0 ranked as the most severe set of challenges to usage of software, other challenges in descending order are data privacy and security of software (1.98), complexity in user interface (1.96). ease of maintenance of software (1.93), Limited awareness and shortage of extension officers (1.90), language barrier (1.84), cultural and social factors and the least challenge being discouragement from usage of software by fellow users.

Table 5: Distribution of Respondents by Severity of Various Challenges to Usage of Agricultural Softwares in the Study Area

Challenges	Severe challenge F (%)	Mild challenge F (%)	Not a challenge F (%)	Weighted Mean Score	Rank
Limited awareness about softwares	70 (93.3)	5 (6.7)	0 (0.0)	1.93	4 th
High cost of softwares and procurement	64 (84.0)	12 (16.0)	0 (0.0)	1.84	6 th
Discouragement by fellow farmers	49 (65.3)	5 (6.7)	21 (28.0)	1.37	8 th
Technical know-how in handling of softwares	73 (97.3)	1 (1.3)	1 (1.3)	1.96	3 rd
Complexity in user interface	72 (96.0)	3 (4.0)	0 (0.0)	1.96	3 rd
Limited digital infrastructure	75 (100.0)	0 (0.0)	0 (0.0)	2.00	1 st
Ease of maintenance	70 (93.3)	3 (4.0)	2 (2.7)	1.90	5 th
Limited extension service	7 (94.7)	3 (4.0)	1 (1.3)	1.93	4 th
Cultural and social factors	65 (86.7)	5 (6.7)	5 (6.7)	1.80	7 th
Language Barriers	63 (84.0)	12 (16.0)	0 (0.0)	1.84	6 th
Regulatory and policy issues	75 (100.0)	0 (0.0)	0 (0.0)	2.00	1 st
Data privacy and security	74 (98.7)	1 (1.3)	0 (0.0)	1.98	2 nd
Reliability and connectivity issues	75 (100.0)	0 (0.0)	0 (0.0)	2.00	1 st
Awareness and perception	75 (100.0)	0 (0.0)	0 ((0.0)	2.00	1 st

Source: Field Survey, 2024

Figures in parentheses are percentages

Test of Hypothesis

H₀: The null hypothesis for the study stated that there is no significant relationship between the socio-economic characteristics of the respondents and the awareness level of farmers on agricultural related softwares for improved agricultural production in Iseyin Local Government.

However, result of the analysis revealed that there is significant relationship between socio-economic characteristics of sex ($x^2 = 5.88$, $p = 0.015$), religion ($x^2 = 26.16$, $p = 0.000002$), marital status ($x^2 = 184.94$, $p = 0.00001$), secondary occupation ($x^2 = 45.02$, $p = 0.001$), and aspect of farming enterprise ($x^2 = 174.54$, $p = 0.001$) and the awareness level of farmers on agricultural related softwares in Iseyin local government. Therefore the null hypothesis was rejected. Meanwhile, educational status do not have a significant impact on the awareness level of farmers on agricultural related softwares in the setting of the study and then the null hypothesis was accepted.

This implies that sex, religion, educational status, secondary occupation, years of farming experience, area of farming enterprises contribute a lot on the awareness level of farmers about agricultural related softwares in Iseyin local government.

H_A: The alternative hypothesis therefore stated that there is significant relationship between the socio-economics characteristics of the respondents and the awareness level of farmers on agricultural related softwares for improved agricultural production in Iseyin local government.

Table 6: Chi-square showing Relationship between Socio-economic Characteristics of the Respondents and Awareness Level of Farmers on Agricultural related Softwares Available to the Respondents

Variables	X ²	P value	Df	Remark
Sex	5.88	0.015	1	S
Religion	26.16	0.000002	2	S
Marital status	184.94	0.00001	4	S
Education status	4.94	0.176	3	NS
Secondary occupation	45.02	0.001	3	S
Aspect of farming enterprise	174.54	0.001	4	S

Source: Computed data, 2024

4.0 CONCLUSION AND RECOMMENDATION

The study considered adoption of agricultural related software as sophistication obligatory to an improved agricultural productivity to tame the tide of food insecurity in the study area. Various agricultural related softwares available for usage within the study area were identified and their awareness level examined. Also, factors influencing the usage of the software were assessed

Arising from the findings of the study, the study recommend the following:

1. Concerted efforts should be committed to enhancement of access to software technologies by massively investing in rural digital infrastructure, providing affordable technological gadgets, uninterrupted power supply and ensuring reliable internet connectivity so as to curb the challenge of poor internet connectivity and facilitate seamless access to usage of agricultural related softwares.
2. There should be a deliberate aggressive awareness campaign of less known agricultural softwares like precision agronomy and data management tools through targeted educational campaigns and demonstration that highlight their benefits to farmers to stimulate the interest of farmers in their adoption and usage to guarantee an improved digital literacy among the respondents.
3. Also , there exist the need to strengthening partnerships among government parastatals, technology providers and agricultural organizations so as to help address infrastructure challenges and ensure that farmers can effectively use these digital tools to improve productivity

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