Extension Agents' Perception of Suitability of Selected e-Agriculture Information Documents in Kwara State, Nigeria
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Abstract
Determining the perception of suitability of selected e-agriculture information document by Extension agents in Kwara State, Nigeria was the main focus of this study. Primary data were collected using a structured questionnaire among 128 extension agents. Frequency, percentage, mean and chi-square were used to analyze data. The result showed that, men (87.5%) dominated extension work in Kwara State, the agents' mean age was 44.8 years and they have the required educational qualifications with a mean household size of 6 people, they were aware of some of the e-agriculture information except legal. The extension agents agreed that 64.7% of the e-agriculture document information from Access Agriculture were suitable for end users. Among others, the non-availability of desired technology ($\bar{x}$=1.08) was the severest of the constraints of the e-agriculture information document. Age, annual income and educational qualification had a significant relationship with awareness of e-agriculture information documents. The study concluded that extension agents were aware all items presented on e-agriculture but deficient in legal aspect, respondents perceived some of the e-agriculture information as suitable while some were not. There is a need for the provision of desired information technology facilities to mobilize extension agents to update farmers on the availability of the e-agriculture information documents

Introduction
Agriculture has been recognized as the basis of economic growth, development and poverty extirpation in the developing countries. According to World Bank (2023), Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity, and feed a projected 9.7 billion people by 2050. It can be deduced from the above statements that for agriculture to play its economical roles effectively and sufficiently, farmers must be in touch with the latest information and communication tools thereby enhancing production and profitability.

The Nigerian government have been making frank efforts to ameliorate agriculture through the engagement of various agricultural research institutes, specialized universities and agricultural development projects dispersed across the country. This entails the breeding of improved species of crops and animals, improved

management of crops and animals and mechanization of most aspects of agricultural production.

Castaneda, et al., (2018), submitted that most of the extreme poor – about 80 percent – live in rural areas. They enormously depend on agriculture or related activities for a livelihood. Access to agriculture information and communication tools is vital for agricultural development as the world is increasingly becoming ICT dependent. According to Oyelami et al. (2022) ICT infrastructure is considered crucial to performance and overall development of many sectors in sub-Saharan Africa (SSA). This can as well affect the stability of market prices for agricultural products. Therefore, prices indicate favourable occasions to producers, consumers, and traders. This is to know when excess demand is creating more profitable opportunities to sell or when excess supply leads to cheaper deals. Information Technology has greatly influenced the future development of "financial sectors" and the various methods of carrying out businesses in different countries of the world. Electronic agriculture is an approach to promoting agricultural information and development of agricultural modernization which mainly include rural electronics, electronic farmers and agricultural electronics.

The Extension agents in Agricultural Development Program (ADP) has been continuously and specifically charged with the responsibilities of agricultural information dissemination, innovation facilitation and discharge to farmers countrywide. This has led to diverse advances to the practices of public extension ranging from Training and Visit to the Research-Extension-Farmers-Input-Linkage-System, Farmers Field School, Community-Based Demand-Driven and University-Based Agricultural Extension System, to incite innovations from the farmers and encourage usage. Public extension leaders have acknowledged the reliant of economic and social roles of NGO and private sector extension models in agricultural and rural development projects. This includes decentralization, cost-recovery, outsourcing and involvement of other key stakeholders (Sennuga et. al., 2020).

According to Maulu et. al., (2021), extension is a casual educational function that relates to any organization circulating information and advice to incite learning, which generally tends to be linked to agriculture, fisheries and aquaculture, and rural development. It is supposed and directed at helping farmers to help themselves by ascertaining their problems; inducing innovations; discovering opportunities; providing advisory services; delivering and promoting latest agricultural technologies and support to the farmers. The States' Agricultural Development Programs (ADPs) has been saddled for a long time with the coordination and delivery of the extension delivery system until 2013 when the Federal Department of Agricultural Extension (FDAE) was established. The department was created to ensure that both public and private extension and externally funded projects are compatible for incorporating agricu ltural development in the country. Agricultural extension agents serve as a link between the researchers and the farmers. Davis et al. (2019) reveals that the ratio of extension agents to farmers is between 1:5,000 and 1: 10,000. This showed that there is a great number of farmers compared to agricultural extension agents in Nigeria, restricting farmers' seamless access to technical information.

Nevertheless, production of food could not successfully meet up with the demand for food by the teeming population due to lack of enabling environment from poor budgetary allocations to agriculture at State and Federal level, logistical challenges in the planning and implementation of extension systems; in-human resource development and management succession; sustainability amidst inaccurate weather forecasts; farmers' access to agricultural inputs, credit facilities/services and validated up-to-date information on existing technologies.

The Federal government's Agricultural Transformation Agenda still has a long way to go in meeting up with the policy that created it. Despite the goal of the government to achieve ICT-based agricultural extension systems to accelerate agricultural development, insignificant attention has been paid to the use of ICT by agricultural extension agents representing the connection between research centers and the farmers.

In lieu of this, Access Agriculture, a non-governmental organization as part of her effort in achieving ICT-based agricultural extension system constantly produces agricultural training videos in local languages that can be easily understood by the farmers to boost agricultural production. However, it is important for the extension agents to determine the suitability of the content of these videos for the end users (farmers). There has been little or no information as touching determining the suitability of Access agriculture's E-Agriculture Information Document by Extension Agents in Kwara State, hence this study.

The objectives of the study are to; examine the socio-economic characteristics of the respondents; examine the awareness of e-agriculture information document by extension agents; determine the suitability of e-agricultural document in the study area; and identify the constraints of e-Agriculture information document by extension agents in Kwara State.

Hypothesis of the study

Ho: there is no significant relationship between some selected socio - economic characteristics and awareness of e-Agriculture information document by extension agents in Kwara State.

Methodology

The study was carried out in Kwara State ADP. The state is positioned between latitudes 7 45'N and 9 30'N and longitude 2 30'E and 6 25'E. The terrain is mainly plain to slightly gentle rolling lands. More so, it has an estimated figure of 203,833 farm families with the majority living in the rural area.

The population for this study comprised all (128) extension workers of Kwara State ADP in all the four zones tagged A, B, C and D. The 128 extension agents in the study area were entirely used for this study. A structured questionnaire was developed, pretested and validated. Socio-economic characteristics was measured using Frequency count, percentages and mean, awareness of e-agriculture was measured using percentage, suitability of e-agriculture documents was measured using frequency and percentage, constraints of e-agriculture was measured using mean, while Chi Square was used to test the stated hypothesis.

Results and Discussions

Extension Agents' awareness of e-agriculture information

The respondents were aware of six (6) out of seven (7) items listed in the e-Agriculture information as provided by Figure 1. All the respondents were not aware of legal information of the e-agriculture information while 91.7% were aware of technical/Scientific, commercial (67.5%), pest and diseases control (65.8%), crop production and protection (75.8%), fertilizer availability and application (58.3%), and livestock production information (66.7%), respectively. This implies that Extension agents in the study area had the needed information that can assist farmers in the area of productivity using ICT. This corroborates the study carried out by Sa'adu et. al. (2022) that showed that all the extension agents in North East, Nigeria demonstrated high level of ICT awareness. Also Nwabugwu et. al. (2019) ascertained

that public extension personnel in Anambra State were aware of one form of e-resources or the other.
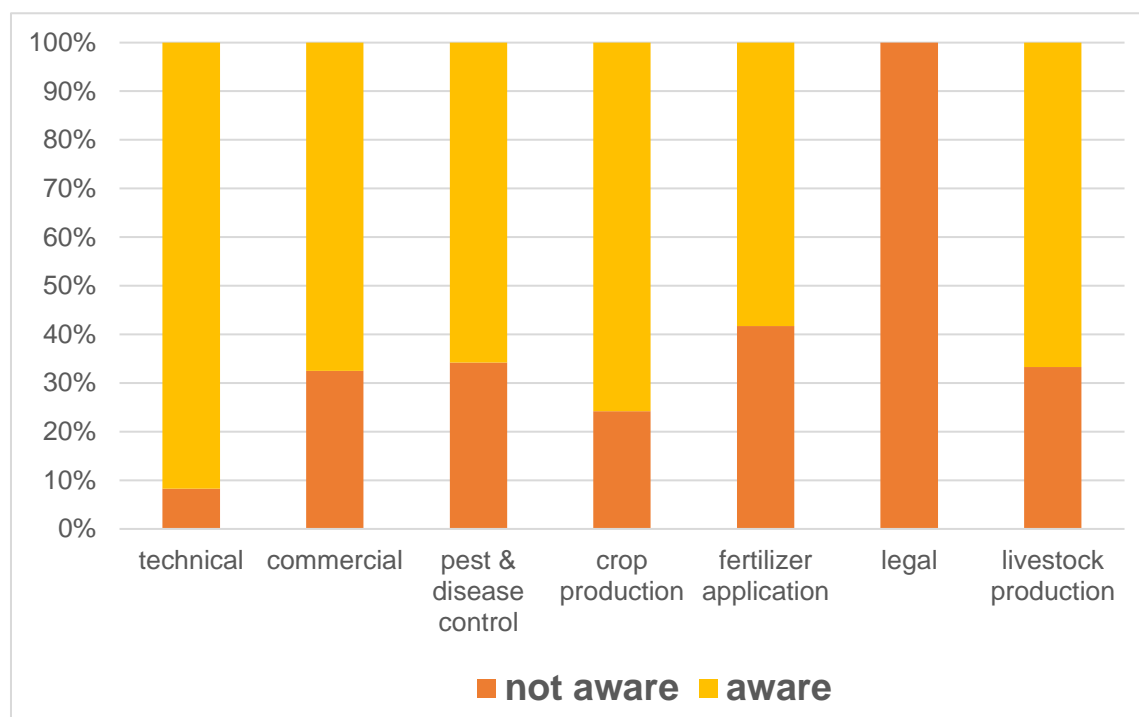
Figure 1: Awareness of e-agriculture information
Source: Field survey, 2021

Suitability of e-agriculture information document by extension agents
Table 2 revealed that out of the 17 statements presented as an e-agriculture document for farmers, only 11 were perceived suitable by the respondents. Statements such as: Provide information on the right time for planting, appropriate spacing and other measure to improve yield had 91.7%, Provide information on Research and development in farming 59.2%, Improve marketing and quality management of farmer's business 66.7% while the 6 statements perceived not suitable were; useful data and collection of information from web portals for farmers (83.3%); online subscription to various commodity sellers for better marketing exposure and pricing (83.3%); improve the facility of online trading and e-commerce for extension agents (65.8%); and training of farmers from distance learning mode education (75.0%). This may be due to some challenges such as poor ICT infrastructural development, high cost of access/interconnectivity to internet, facing the use of ICT in Nigeria. This corroborates the finding of Hussaini, et. al. (2021) that ICT programmes in Nigeria are not sustainable and utilization of E-agriculture are low among small-scale farmers.

Table 2: Suitability of e-agriculture information document to the study area by extension agents

Statements	Suitable (%)
Provide information on the right time for planting, appropriate spacing and other measure to improve yield.	91.7
Provide information on Research and development in farming.	59.2

Reduce the insufficiency of customers to the rural farmers.	42.5
Improve marketing and quality management of farmer's business	66.7
Improve agricultural administration and extension activities.	91.7
Provide precise information on herbicide tolerance.	58.3
Provide information on control use of pesticide and fertilizer supplements.	
Improved networking and communication of extension agents	58.3
Improve the facility of online trading and e-commerce for farmers	34.2
Reduction of agricultural risks and enhanced incomes being aware and updated through media.	66.7
Promotion of farming technologies using interactive multimedia	50.0
Bridging the gap between farmers and markets by internet linkage	41.7
Training of farmers from distance learning mode education	25.0
Online subscription to various commodity sellers for better Marketing exposure and pricing	16.7
Better and spontaneous agricultural practices	40.8
Useful data and collection of information from web portals for farmers	16.7
Timely information on weather forecasts and calamities	91.7

Source: Field survey, 2021.

Constraints to e-agriculture information document by extension agents in Kwara State

Results in Table 3 revealed that availability of desired technology ($\bar{x}$=1.08) is the severest of the constraints to e-agriculture information documents, followed by non-, high cost of access/interconnectivity ($\bar{x}$=1.09), Poor ICT infrastructural development ($\bar{x}$ = 1.17) weak extension activities at village level ($\bar{x}$=1.24) and lack of conviction of the new technology ($\bar{x}$=1.41) were seen to pose severe constraints to e-agriculture information document, while others were perceived as not severe constraints by the extension agents. This finding is in line with Nwabugwu, et. al. (2019) that constraints to utilization of e-resources among Public Extension Personnel in Anambra State, Nigeria are; poor internet access, high cost of internet, combined with complexity of usage
.

Table 3: Constraints of e-agriculture information document by extension agents in Kwara State.

Constraints	Mean	Standard Deviation
Non-availability of desired technology	1.08	0.41
High cost of access/interconnectivity	1.09	0.46
Poor ICT infrastructural development	1.17	0.44
Weak extension activities at village level	1.24	0.44
Lack of conviction of the new technology	1.41	0.44
Insufficient training programme	1.92	0.42
Insufficient/Inadequate knowledge of ICTs	1.92	0.43
Inadequate capital	1.93	0.42
Poor documentation, storage and retrieval techniques	1.93	0.44
Complexity of new practices	1.94	0.43
Insufficient information	2.42	0.41
Poor inspection	2.65	0.45
Grand mean	**1.72**	

Source: Field survey, 2021.

Association between Socio-economic characteristics and awareness of e-agriculture information document by extension agents in Kwara State

Table 4 shows that there was a significant association between selected socio-economic characteristics of respondents such as age (χ^2 = 0.049, p ≤ 0.05), annual income (χ^2 = 12.812, p ≤ 0.05) and educational qualification (χ^2 = 17.315, p ≤ 0.05) and awareness of e-agriculture information document. The implication of this is that, the respondents' age had a significant relationship with awareness of e-agriculture information document. It can be deduced that since the extension agents had a mean age of 48 years, they can easily flow with the technology development in their environment with the vibrancy it deserved. Annual income was also significant, thus means that an individual can venture to acquire more knowledge such as purchasing desired technology equipment, access internet for connectivity, when there is wherewithal (finance) to do such. The more technological literate an individual is, the more he/she tends to explore the internet. This can explain why the educational qualification of the respondents had a relationship with awareness of e-agriculture information document in the study area. This implies that awareness is vital to e-agricultural documents. Umar et al., (2019) noted that poor knowledge or exposure of farmers to suitable agricultural information and networks of communication of this information is one of the key reasons for the low yield reported by many Nigerian farmers as well as the success in the duties of agricultural extension agents.

Table 4: Socioeconomic characteristics and awareness of e-agriculture information document by extension agents in Kwara state

Variables Decision	χ^2	Degree of Freedom	p-value	
Age*	0.049	2	.003	S
Household size	15.789	5	.062	NS
Annual income*	12.812	4	.000	S
Educational Qualification*	17.315	6	.002	S

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*P ≤ 0.05
Source: Field survey 2021

Conclusion and Recommendations

Extension agents in Kwara State were aware of e-Agriculture information document, but handicapped in the area of legal information. and more than average of the e-agriculture information documents were perceived suitable for use in the study area. Some of the constraints of e-agriculture were non-availability of desired technology and high cost of access/interconnectivity. However, there is need for the extension agents to replicate the knowledge they have on e-agriculture to farmers on accessing these documents to better their lots. Stakeholders in agricultural sectors (government and non-governmental actors) should encourage extension agents through provision of needed ICT facilities. More NGOs should be encouraged to produce e-agriculture information documents that will improve farmers' productivity and reduce poverty in the nation. Finally, Government should endeavour to increase salaries to encourage extension agents to be more proactive in their area of specialization as what they are earning now is not enough.

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