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Agricultural Information: A Catalyst for Productivity and Economic Development

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Agricultural information is an important aspect of agricultural practices. It is a bridge that links farmers to access information from customers, receive market update, acquisition of fertilizers and pesticide information, weather forecast for productivity etc. The paper focuses on agricultural information, productivities as it leads to economic development. The study population are registered farmers in Ogun state Nigeria. The proportionate stratified random sampling technique was used in the study. The study sample size totals 387 farmers and 363 copies of questionnaires were retrieved. Regression analysis was used to analyze the hypothesis in order to describe the variables in the study. The findings revealed that agricultural information significantly influenced productivity and economic development ($\beta = .282$, $t = 4.191$, $R^2 = .064$, $p < .05$). The paper concluded that the use of information gadget by farmers for agricultural information should be encouraged. Effort should be made by the agricultural agencies to establish relationship with telecommunication companies in other to enhance productivity.

1. Introduction

Information has been identified as one of the resources required for the improvement of agricultural production. Farmers planting on their farms are now faced with challenges of weather, temperature, soil moisture, and fertilization as well as pests and diseases which affect the growth of their farm products. It can be argued these challenges are due to inadequate access to agricultural information. It has been observed by scholars that information plays an important role in any business organisation, as it is needed in all spheres of human endeavor. Information is also necessary to facilitate decision-making and an essential component of organisational life which engender progress, and are widely recognised for both national and personal development (Ada, & Ghaffarzadeh, 2015).

Agricultural information is necessary for the overall development of a nation. Although the use of information technology can assist farmers in acquiring timely information on agriculture activities such as pricing, transportation, updates on weather forecast, credit facilities, and extension services among others, this is not always the case as some farmers may not be using information technology for the purpose of acquiring agricultural information. This may result to poor farm yield, lack of access to credit facilities, poor knowledge of preservation techniques, inadequate market and transport information, among others.

Farmers faced difficulty in acquiring agricultural information on the new modern technology to improve their farm productions compared to their conventional sources of information. According to Obidike (2011) when rural farmers lack access to knowledge and information that would help them achieve maximum agricultural yield, they are not only grope in the dark, but are driven to the urban centres in search of formal employment, as the only option for survival. To further explain the disadvantages of lack of access to agricultural information, farmers in some parts of the country are sidelined when it comes to producing agricultural product probably due to non-availability and lack of access to timely and up-to-date information that could enable them to achieve optimal yield from their farms.

In view of this, the modern day technology provides farmers with reliable information on areas like seedlings, methods of cultivation and fertilizer application, pest and weed control/eradication, and also livestock production and disease control. In addition, studies have indicated that access to timely and quality information have a significant role to play in the transformation process of any agrarian economy. The lack of access to timely information that would help farmers reach optimal agricultural harvest, would result for them only

continue to grope in the dark. Studies further reveal how agricultural information could have impact in rural areas and that farmers would benefit from global information, if information centres, are situated in rural areas, complete with all information and communication gadgets (Yusuf, Shuaib, & Nofiu, 2020).

Furthermore, Mittal and Mehar (2013), maintained that despite the increasing demand for relevant and timely agricultural information in rural areas, there remains a digital divide that has prevented the percolation of benefits to the poor. Information technology can act as a remedy because of its wide reach and low cost of delivering information, it also has the advantage of greater flexibility, since it can enable information dissemination through both voice and text messages. Information technologies are being used for agricultural information to achieve productivity, reduce cost, and better price realization. It is in view of this that the study seeks to examine the effect of agricultural information on productivity and economic development in our society and most especially in the rural areas.

2. Method

The theory relevant to this study is Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM)

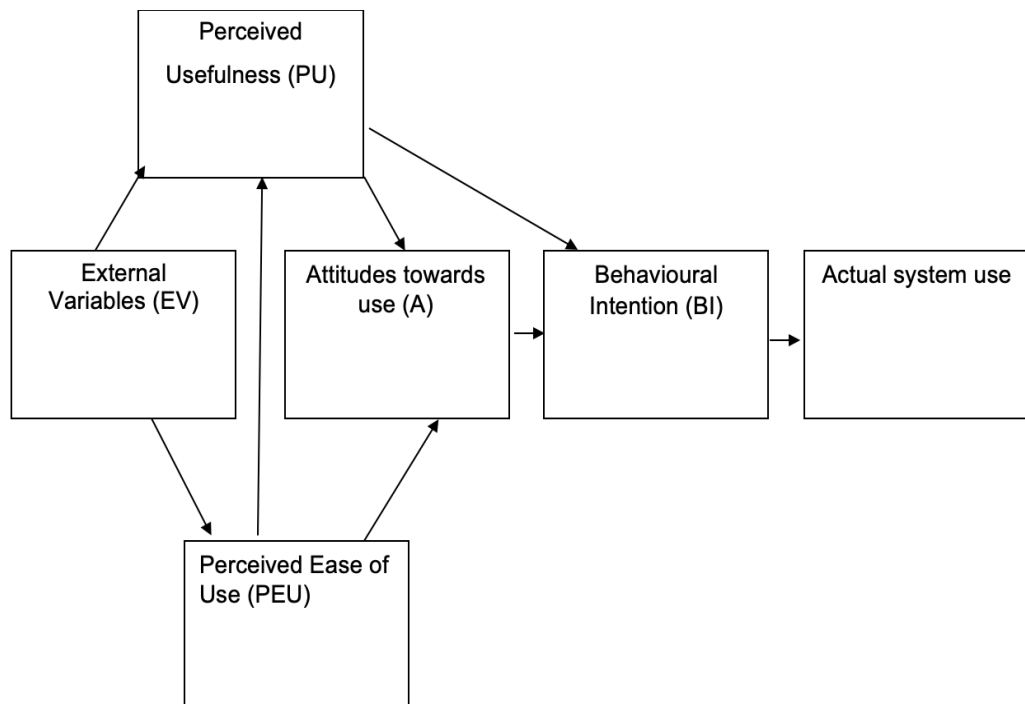


Fig 1: The Research Model of Technology Acceptance Model (TAM) (Adapted from Davis 1989)

The Technology Acceptance Model (TAM) was constructed by Davis in 1989. The diagram initially developed for new end-user of information systems for organizations, is one of the most influential models in the study of technology use. It explains the factors influencing the behaviour of an individual regarding accepting and using new technology. Davis further explains the diagram as follows: Perceived usefulness (PU) is the key determinant of acceptance, meaning the user's subjective probability that using a specific application system will increase his or her job performance and productivity within an organizational context. Perceived ease of use (PEU), is the degree to which the user expects the target system to be free of effort. Together, PU and PEU determine the attitude (A) of a person towards using the system. Finally with the influence of PU and Attitude, Behavioural Intention (BI) influences the actual use of the system. The theory is instrumental for this study considering it acceptance toward the use of ICT for agricultural information. It will enhance performance, competence and productivity as well as economic development. The theory will also facilitate farmers' adoption of new technology, especially mobile phones, for acquiring different kinds of agricultural information.

The study used a descriptive survey research design to collect data from a representative sample of the population under study. The study population are registered farmers in Ogun state Nigeria. The proportionate stratified random sampling technique was used in the study. The study sample size totals 387 farmers and 363 copies of questionnaires were retrieved. Regression analysis was used to analyze the hypothesis in order to describe the variables in the study. Data was collected using a questionnaire, collated, and subjected to comprehensive data analysis using the Statistical Package for the Social Science (SPSS) software.

3. Result and Discussion

Table 1: Demographic Information of Respondents

Characteristics	Categories	Frequency	Percentage
Age Range	20-30	52	14.3
	31-40	62	17.1
	41-50	103	28.4
	51 -60	88	24.2
	61 Above	58	16.0
	Total	363	100.0
Gender	Male	231	63.6
	Female	132	36.4
	Total	363	100.0
Marital status	Single	43	22.0

Educational Qualification	Married	287	44.0
	Widow	33	33.9
	Total	363	100.0
	Fist living	89	24.5
	SSCE	125	34.4
	BSc	79	21.8
	MSc	6	1.7
	PhD	3	.8
	None	61	16.8
	Total	363	100.0

The result gives detail of the demographic information of the respondents, which include Age, Gender, Marital status, and Educational qualification. The age distribution of the respondents ranged from 20 and above, and 41-50 (103, 28.4%) being the age group with the highest number of respondents while 20-30 (52, 14.3%) being the group with the least number of respondents. It implies that more of the respondents were adult and more responsible.

Finding revealed that male was with the highest number of respondents (231, 63.6%) while female were (132, 36.4%). Result further shows that majority (287, 44.0%) of the respondents were married and SSCE (125, 34.4%) was their highest qualification while PhD being the least qualification with (3, .8%).

Testing of Research Hypothesis

The following research hypothesis was tested at $\alpha = 0.05$ level of significance

Agricultural information does not significantly influence productivity and economic development among farmers in Nigeria.

Table 2: Agricultural information, productivity and economic development in Nigeria

Model	Unstandardised Coefficients		Standardised Coefficients Beta	T	Sig.
	B	Std. Error			
(Constant)	87.8 40	6.386		14.723	.000
Agricultural Information	.419	.062	.282	4.191	.000
R = .282^a; R² = .064; Adjusted R² = .62; F = 32.383; P = 0.000					
a. Dependent Variable: Productivity and economic development					

The table reveals that agricultural information ($\beta = .282, p < .05$) significantly influenced productivity and economic development among farmers in Nigeria. Therefore, the null hypothesis was rejected. 6% of the variation in the dependent variable (Productivity) was accounted for by the independent variable. This is in accordance with the United Republic of Tanzania (URT) (2010), on agricultural information and productivity. They asserts that in the agricultural sector, like in many other sectors, information is becoming a major input whereas knowledge and information plays a fundamental role for farmers to respond to opportunities that could progress their agricultural productivity. However, Information on the price factors such as prices of inputs and output, and non-price factors like information about availability of inputs, quality of seeds, modern techniques, etc. would play the primary role in improving farm productivity (Mittal &Tripathi, 2009). It has also been documented that information technology usage facilitates more competent production, aid in the distribution, marketing of products and services, and also helps to gain an understanding of international markets (Hooper, Kew, Herrington, 2010).

Discussion of Findings

These findings are in line with the study of Aker (2011) who examined the role of ICT in supporting access to information about agricultural technologies and extension services. She further explained that a number of challenges are associated with the use of ICT in agricultural extension, such as the need for literacy skills and technological knowledge, the limits of mobiles to display complex information, and technical difficulties in developing voice-based systems. Similarly, a study conducted by Frempong et al., (2007) in Ghana shows that the extent of SMS usage by farmers are lesser due to higher rate of illiteracy. By implication it was evident from the findings that farmers in Nigeria need to improve on their literacy skills and technological knowledge.

The findings reveal the level of relationships between the study's independent variable that is agricultural information and the dependent variable: productivity and economic development as expressed in the study's research hypothesis. Findings from the study reveal that agricultural information significantly influenced productivity and economic development. This is in agreement with the finding of Lionberger (1955) who found a close association between contacts with farm information and the level of farmers' productivity. Another study by Wilson & Gallup (1958) also found that responses regarding the use of farm information were related to such factors as income, status of farmers and tenure. This indicates high improvement in farmers' accessibility and utilization of information on agriculture.

Challenges Encountered through the use of Agricultural Information for Productivity and Economic Development

The main challenge generally faced by farmers, especially in the rural community, is illiteracy. Studies by Frempong et al., (2007) reported that the extent of SMS usage by farmers is lesser due to higher rate of illiteracy. They gave an example of the Drum Net study which revealed that only 9% of the respondents know how to send an SMS for business purposes while the corresponding figure in Ghana was 21%. Surveys of information Technology users in rural areas of India, Kenya, Mozambique, Sri Lanka and Tanzania found that ICT were hardly used for knowledge gathering and agricultural information was mainly obtained through face-to-face contacts (Ratnadiwakara, et al 2008). This could be due to lack of electricity to charge their batteries. This position has given room for low per capita income in many African countries especially in the rural areas (Akinola, 2017). A study in India concluded that differences in the use of ICT for information search may be explained by the profitability of agriculture in the region; thus, farmers more actively sought information in areas where agriculture was profitable, while farmers' in less profitable areas were reluctant to seek and try out new know-how (Kameswari 2011).

Farmers were forced to accept prices of middlemen due to the perishable nature of the produce, limited storage facilities and lack of alternative markets as a result of inadequate access to agricultural information (Kameswari 2011). Moreover, farmers were often dependent on buyers as a source of loans and information (Molony 2008).

Cullen (2002) and Rao (2003) identified the barriers to using ICTs in the rural areas as comprising:

- i. Physical access:** This involves the lack of a robust telecommunications infrastructure with sufficient reliable bandwidth for internet connections. Rural communities suffer from geographic isolation, low bandwidth, unreliable connections, and interference from agricultural equipment such as electric fences.
- ii. Lack of awareness of the benefits of ICTs:** Despite the growing numbers of people who own a computer and have internet access, most people in developing countries have little opportunity to connect to the internet and therefore are unaware of the socio-economic benefits and stimulus that ICTs can bring to their lives. Because of the absence of demonstration projects in some countries, very limited information is available to access ICTs and to advocate for the impact of ICTs on development.
- iii. Lack of ICT skills:** There are low levels of computing and technology skills. Manual workers and the unemployed are exposed less to such opportunities. Cost, restricting access to equipment; low educational achievement; culture, age or gender based exclusion from

literacy and computer skills counteracts against the dissemination of such skills in disadvantaged communities.

iv. Attitudinal barriers like cultural and behavioral attitudes towards technology:

Computers are for intelligent people and are difficult to use, they belong to the middle class. This has contributed to the lack of access to ICTs in the rural community due to the technicality that computer technological devices entail.

v. Language barriers in using the Internet: These prevent people from familiarizing themselves with the benefits of Internet-based information resources, which invariably require an ability to understand international languages, especially English. As a result, most people in developing countries cannot read and understand most of the internet content. Another factor is the high illiteracy rate among rural people.

vi. Lack of local language information products or content: This is lack of suitable information tailored to the need and assimilation capacities of rural people in developing countries. In order to better adjust their investment decisions, rural people need updated information on market prices, new agricultural technologies and methods to raise the quality of their products, adapt to changing climatic conditions or demands of agricultural markets.

vii. Non-availability of governmental information online: Most developing countries do not have pro-poor ICT policies and plans to re-orientate relevant government institutes as electronic service providers to boost rural development.

viii. Lack of motivation to use information over the internet: Despite connectivity, people will not use ICTs unless they are motivated to do so. The prevailing modality of internet access requires a certain level of competence from the user that many individuals in developing countries do not have.

Lack of access facilities: Access facilities include computers and connectivity in rural areas. The cost of computers is still beyond the purchasing power of the majority of individuals in developing countries. The internet is often far too expensive to be accessible to ordinary citizens and most public service institutions. It is often available only in urban centres, where most Internet Service Providers (ISPs) have their market. These and many more are challenges faced by farmers from accessing agricultural information.

4. Conclusion

The outcome of this paper has made this research an additional source of material to the body of literature in the area of agriculture, mobile communication and economic development. The study will make important contributions to knowledge in various ways. Firstly, ministry of

agriculture, extension officers and in particular farmers would benefit from this research by improving their communications for better access to vital information on agriculture and other information needs. It also provides a road map that will assist the government through ministry of agriculture and communication agencies to establish policies that will promote agriculture, technology and productivity among farmers. In particular, the study has established the fact that the use of technology helps farmers to determine the market value of their products. The study concluded that agricultural information has improve farmers' information seeking behavior and increase productivity as well as improve economy of nations.

However, the study recommends the following: They are:

1. More trainings, seminars and workshops should be organized by agricultural extension officers and other agencies involved to educate the farmers on the importance and use of mobile phones to enhance their agricultural business.
2. Telecommunication companies should improve on their network coverage, most especially, the rural communities.
3. Telecommunication companies in conjunction with the government agencies should provide a low tariff plan for farmers. This would enable them to adequately utilize their mobile phones for agricultural information.
4. The community leaders should liaise with the government for alternative power supply within the community in case there is constant epileptic power supply.
5. Ministry of Agriculture and Forestry and other agricultural agencies should support the awareness and encourage farmers towards the use of mobile phones in their business dealings.

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