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Appraisal of Crop Farmers' Access to Agricultural Information for Enhanced Food Security in the COVID-19 Era in Nigeria

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Abstract: This study, "Appraisal of Crop Farmers' access to Agricultural Information for Enhanced Food Security in the COVID-19 era in Nigeria" investigated how crop farmers have access to agricultural information and the value of their exposure to such information on food security in the COVID-19 in Nigeria. Specifically, the objectives of the study were: to find out the kinds of agricultural information accessible for crop farmers; examine the kinds of crops that farmers access information on: ascertain the sources from which crop farmers access their agricultural information; determine the source of agricultural information more credible to crop farmers; investigate the extent to which crop farmers satisfy with the agricultural information accessible for them; and explore how the agricultural information accessed is used by farmers to enhance the production crops and food security in the COVID-19 era in Nigeria. Descriptive survey research design was adopted and the questionnaire was used as the research instrument for data collection. The population of the study comprised 2708690 registered crop farmers in Nigeria from which a sample size of 1067 was statistically drawn, using Qualtrics[XM] online sample size calculator. Multistage sampling involving stratified, purposive and proportionate techniques were used in sampling the respondents. Primary and secondary sources were used to collect the data while descriptive method was adopted for data analysis with Multivariate Frequency Distribution Tables and SPSS used as the statistical tools for data analysis in this study. Findings revealed that information on fertilizer application was accessed by crop farmers more followed by weed control, while there was a decline in the rate of information accessibility for loans application, pest control, seeds selection, agric marketing among others. The information accessible to crop farmers enabled them to engage more in timely fertilizer application and early control of weeds while there was poor application of other forms of agricultural information. The study concluded by stressing that access to adequate and useful agricultural information by crop farmers is essential for enhanced food production as inadequate access to such information will result to poor application of agricultural innovations capable of preventing the country from attaining food sufficiency and security. The study recommended amongst other considerations the prioritizing of agricultural information to increase farmers' access to agricultural information. Training of crop farmers through workshops and seminars with strict adherence to COVID-19 guidelines was also considered a milestone in the enhancement of food security.

Keywords: Appraisal, Crop Farmers' Access, Agricultural Information, Food Security, COVID-19 Era

INTRODUCTION

The relevance of information in all areas of human endeavours has been examined by different scholars (Olaniyi and Ogunkunle, 2018; Bankapur and Bhavanishankar, 2018; Idiake-Ochei, Onemolease & Erie, 2016; Demet, Nilay, Marco & Tunç, 2016; Awili, White & Kimotho, 2016; Odoemelam and Olojede, 2016; Kamba 2009; Moore 2007; Sharma and Fatima, 2004; UNDP, 2001, UN, 2001). One of the areas that information is required for necessary action is agriculture and food security. Improved knowledge in the production of agriculture and food security has been linked to access to timely and quality agricultural information (Saleh, Burabe, Mustapha & Nuhu, 2018; Ayalew, 2017; Anju and Satbir, 2017; Idiake-Ochei, Onemolease & Erie, 2016; Ukachi, 2015; Opara, 2008; Adomi, Ogbomo & Inoni, 2003; Chen, Liu and Yang, 2011; Rodman, 2006). The Food and Agricultural Organisation for instance argues that sustainable food security is based less on material inputs such as seeds and fertilizer; rather, it is based on investing in people involved in their use. Thus, a critical factor in meeting the challenge of ensuring food security is human resources development through knowledge building and information sharing (FAO, 1998 in Mulauzi and Zulu, 2012). This is because information and knowledge are powerful tools that enable farmers to put agricultural science and production inputs to best use in order to be food secure. Without information and knowledge, farmers cannot succeed in their agricultural efforts (Munyua, 2000 in Mulauzi and Zulu, 2012).

The areas by which crop farmers seek to access information that can improve food production security have equally been examined (Meitei and Devi, 2009 in Demet, Nilay, Marco and Tunç, 2016). Field acquisition, agricultural inputs (seeds, pesticides, agricultural equipment, weather conditions, harvest technology etc), agricultural technology, agricultural credit (e.g. terms of loans), agricultural marketing, and food technology are some agricultural information accessible to farmers (Olumuyiwa and Tajudeen, 2018; Sunil, Sangeetha & Shaik, 2018; Acheampong, Frimpong, Asante, 2017; Salau, Saingbe and Garba, 2014; Babu, Glendenning, Kumar, S. & Govindarajan, 2012; Meitei and Devi, 2009; Munyua, 2000). Availability of information and knowledge helps farmers to make meaningful decisions and solve problems effectively hence leading to sustainable agricultural production and food security (Kaniki, 1989 in Mulauzi and Zulu, 2012). Additionally, agricultural information and knowledge results in sustainable agriculture productivity and bumper harvests for consumption within and outside the producing country, leading to food security and foreign exchange vital for economic development of the country (Alemma, 1995 in Mulauzi and Zulu, 2012).

A number of sources exist through which access to information on agricultural production to enhance food security among crop farmers is made possible (Stringer, Robert & Pinchbeck, 2019), with fellow farmers, extension agents, radio, family members and friends, community libraries with adequate agricultural sources, visits to organic farms, researchers and Community-based Organizations (CBOs), mobile phones, possible attendance at seminars and regional meetings, audio-visual sources and serving as some of the many sources of agricultural information for farmers (Mapiye, Makombe & Dzama, 2020; Antidius, 2020; Brhane, Mammo & Negusse, 2017; Mbanda-Obura, Tabu & Obura, 2017; Adio, Abu, Yusufu & Nansoh, 2016; Bello and Obinne, 2012, Olajide, 2011; Ukachi, 2007). Shortage of infrastructure, lack of ICT and service fee, lack of interest and inadequate users' skill and knowledge among many others have been pointed as the challenges limiting farmers' access to the required agricultural information (Brhane, Mammo & Negusse, 2017; Acheampong, Frimpong, Asante, 2017).

Food security which refers to a state where "all people have access to safe, nutritious and affordable food that provides the foundation for active and healthy lives" (Fawole, Ilbasmis &

Ozkan, 2015, p. 5) is the basic necessity of life. However, this basic necessity of life is right now under threat more than ever before due to the outbreak of the COVID-19 pandemic (Schlein, 2020; Ehui, 2020; Community on World Food Security, 2020; United Nations, 2020; Aminou, Guillaume, Patricio & Matty, 2020). Community on World Food Security (2020) and United Nations (2020) reports, for instance, indicate that the impacts of COVID-19 on food supply and demand will directly and indirectly affect all four pillars of food security and nutrition (FSN): availability, access, utilization and stability with severe consequences for health and nutrition. According to the World Food Programme (2020, p. 1) projected that:

> The COVID-19 pandemic could almost double the number of people suffering acute hunger, pushing it to more than a quarter of a billion by the end of 2020. The number of people facing acute food insecurity stands to rise to 265 million in 2020, up by 130 million from the 135 million in 2019, as a result of the economic impact of COVID-19.

Access to information which is a critical area in improving knowledge which leads to the improvement in food security is also expected to be affected by the COVID-19 pandemic. However, previous reports that captured the impact of the COVID-19 on food security were not definite on how the pandemic affects crop farmers' access to agricultural information and the way it affects the production of food crops for enhanced food security in Nigeria. It is the intention of this empirical paper to therefore bridge this research gap.

Statement of the Problem

The outbreak of the COVID-19 pandemic has posed a serious threat to food security globally and Nigeria is not an exception in the share of the impact. There are already reports that acknowledged the direct and indirect impacts of the COVID-19 on all four pillars of food security and nutrition (FSN), which are: availability, access, utilization and stability with severe consequences for health and nutrition (Schlein, 2020; Ehui, 2020; Community on World Food Security, 2020; United Nations, 2020; Aminou, Guillaume, Patricio & Matty, 2020). However, from these reports, it seems to be a gap on how COVID-19 impacts food security with regards to crop farmers' access to agricultural information in Nigeria. How crop farmers access agricultural information and the value of such accessibility on improved knowledge for enhanced food security in the COVID-19 pandemic era in Nigeria is therefore, the problem this study investigates.

Objectives of the Study

The overall objective of this study is to appraise the way crop farmers access agricultural information for enhanced food security in the COVID-19 era in Nigeria. The specific objectives of this study, therefore, are:

i. To find out the kinds of agricultural information crop farmers access for enhanced food security in the COVID-19 era in Nigeria.

ii. To examine the kinds of crops farmers access information on for enhanced food security in the COVID-19 era in Nigeria.

iii. To ascertain the sources through which crop farmers access agricultural information from for enhanced food security in the COVID-19 era in Nigeria.

iv. To determine the source of agricultural information more credible for crop farmers in the era of COVID-19 in Nigeria.

v. To investigate the extent to which crop farmers are satisfied with the agricultural information accessible to them for enhanced food security in the COVID-19 era in Nigeria.

vi. To explore how the agricultural information accessed is used by farmers to improve crops production for enhanced food security in the COVID-19 era in Nigeria.

Research Questions

i. What kinds of agricultural information do the crop farmers access for enhanced food security in the COVID-19 era in Nigeria?
ii. What kinds of food crops do the crop farmers seek to access information for enhanced food security in the COVID-19 era in Nigeria?
iii. What sources do the crop farmers access agricultural information from for enhanced food security in the COVID-19 era in Nigeria?
iv. Which of the sources of agricultural information is more credible for crop farmers in the era of COVID-19 in Nigeria?
v. To what extent do the crop farmers satisfy with the kinds of agricultural information accessible to them for enhanced food security in the COVID-19 era in Nigeria?
vi. How do crop farmers utilize the agricultural information accessed to improve crops production for enhanced food security in the COVID-19 era in Nigeria?

LITERATURE REVIEW

Food security which is a state where "all people have access to safe, nutritious and affordable food that provides the foundation for active and healthy lives" (Fawole, Ilbasmiş & Ozkan, 2015, p. 5) is the basic necessity of life. However, the food sector now is under threat more than ever before due to the outbreak of the COVID-19 pandemic (Schlein, 2020; Ehui, 2020; Community on World Food Security, 2020; United Nations, 2020; Aminou, Guillaume, Patricio & Matty, 2020). Community on World Food Security (2020) and United Nations (2020) reports, for instance, indicate that the impacts of COVID-19 on food supply and demand will directly and indirectly affect all four pillars of food security and nutrition (FSN): availability, access, utilization and stability with severe consequences for health and nutrition. According to UN (2020) report:

> The COVID-19 crisis threatens the food security and nutrition of millions of people, many of whom were already suffering. ... The control and mitigation measures enforced worldwide, combined with the massive economic impacts of these necessary measures, are the proximate causes of this emergency. Conflict, natural disaster, and the arrival of pests and plagues on a transcontinental scale all preceded COVID-19 and serve as additional stresses in many contexts. But there are also deep structural problems in the way our food systems function, which we can no longer ignore.

The fact from the above excerpt is that the outbreak of the COVID-19 pandemic has posed a serious challenge in the food sector and much needed to be done to avert the severe ominous food crisis globally. Massive improvement in the production of agricultural food crops is a sure way of averting the impending crisis in the food sector and this cannot be done without farmers' access to information as Kursat, Huseyin, Vedat, Savas & Osman (2008, p. 2) affirmed:

> Agricultural information interacts with and influences agricultural productivity in a variety of ways. It can help inform decisions regarding land, labour, livestock, capital and management. Agricultural productivity can arguably be improved by relevant, reliable and useful information and knowledge.

Information brings about knowledge, and a knowledgeable community is also an informed community. This signifies that a community cannot develop without knowledge, and a community can only become knowledgeable if they recognize and use information as their tool for development (Omotayo, 2018; Kamba, 2009; Mchombu, 2006, Singh & Satija, 2006), as "appropriateness of information is a critical factor needed to stimulate the right knowledge and attitude of farmers towards sustainable transformation of agriculture" (Odoemelam and Alocha, 2015, p 98). Access to the right information by rural farmers can help them to acquire the skills, knowledge and confidence sufficient enough to participate fully in agricultural activities (Moore, 2007; Odini, 2005). Limited access to agricultural information is one of the key factors that have narrowed agricultural development in the developing countries. Failure of agricultural service providers to meet the information needs of farmers in relation to agricultural inputs, agricultural technology, extension education, agricultural credit and agricultural marketing in the recent past has been established (Abdu`Rahman, 2018).

Agricultural information accessible to farmers are in different ways, including information on pests and disease control, improved seeds/seedlings, crop and animal husbandry, farm credits, marketing information, fertilizer and agrochemicals, post-harvest technology, control of weeds, modern technology, climate and weather forecast, farm location, food safety and hygiene, among others (Lughlugh, 2020; Olaniyi and Ogunkunle, 2018; Baba, 2018; Abdu`Rahman, 2018; Adetimehin, Okunlola and Owolabi, 2018; Ifejika, 2016; Odoemelam and Olojede, 2016; Idiake-Ochei, Onemolease and Erie, 2016; Oyeniyi and Olofinsawe, 2015; Olajide, 2015; Saingbe and Garba, 2014; Ezeh, 2013; Ayubu, Malongo, Siza & Respickius, 2012). Salau, Saingbe and Garba (2014), in their study found that the respondents' information needs were numerous and diverse which included information on pests and disease control, improved seeds/seedlings, crop and animal husbandry, farm credits and marketing information among others. In the study by Lughlugh (2020), the findings were that fertilizer and agrochemicals, pest and diseases control, agricultural finance, improved seedling, post-harvest technology, control of weeds, modern technology application among others were some of the information needs of farmers for sustainable agricultural development in Benue State. Finding in the study conducted by Olaniyi and Ogunkunle (2018) revealed that farmers' agricultural and nutritional information needs included climate and weather forecast, location and availability of inputs, food safety and hygiene, markets where farm produce are exchanged for other farm produce and disease control. Olajide's (2015) study revealed that crop farmers had adequate access to information on land preparation, organic farming, harvesting of crops and adjudged information from the broadcast as appropriate for their enterprise.

The information accessed by farmers is useful in different ways, including improved

farmers' productivity, increased income and proper use of improved varieties crops (Ogunniyi and Ojebuyi, 2020; Lughlugh, 2020; Asa and Uwem, 2017; Odoi, 2017; Adegebo, 2016; Ifejika, 2016; Folitse, Osei, Dzandu & Obeng-Koranteng, 2016; Olajide, 2015; Banya, 2014; Oriakhi and Okoedo-Okojie, 2013). In their study Asa and Uwem (2017) revealed that Getting information from fellow farmers, marketing of produce, accessing inputs for farming, getting agricultural information from radio and the internet, and accessing extension services were the major agricultural uses of mobile phones by farmers in the study area. A study conducted by Folitse, Osei, Dzandu & Obeng-Koranteng (2016) revealed that farmers had gained knowledge in various improved practices as a result of the Royal FM agricultural programme and increase in knowledge has resulted in increased agricultural output and productivity leading to higher sustainable incomes. Olajide's (2015) study revealed that crop farmers utilised information accessed on land preparation, organic farming, harvesting of crops, integrated pest management techniques and site selection for crop production.

Different sources exist for farmers to access agricultural information (Statrasts, 2004; Riesenberg and Gor, 1999; Adhiguru, Birthal and Kumar, 2009; Ogboma, 2010; Babu, Glendenning, Asenso-Okyere & Govindarajan, 2011; Meitei and Devi, 2009; Mtega and Benard, 2013; Daudu, Chado & Igbashal, 2009; Ogboma, 2010; Similarly, Bozi and Ozcatalbas, 2010; Asa and Uwem, 2017; Ezeh, 2013; Ijiekhuamhen and Omosekejimi, 2016; Oluwatoyin, 2016; Suleiman, Ogakason & Faruk, 2018; Umunakwe, Nnadi, Chikaire and Nnadi, 2014; Olaniyi and Ogunkunle, 2018; Yohanna, Ndaghu & Barnabas, 2014; Ogunsola, Ogunsola, Alarape, Oloba and Osalusi, 2019; Pamphily, Harrison and Emily, 2017; Odoemelam and Alocha, 2015; Ha, Okigbo and Igboaka, 2008; Ekoja, 2003; Kleih, Okoboi and Janowski, 2004; Mwakaje, 2010; Kari, 2007; Weiss, Van Crowder and Bernard, 2000; AgREN, 2000; Kalusopa, 2005; Alimi, Olugbenga and Ayoola, 2017; Ifejika, 2016; Uzuegbu and Naga, 2016; Saleh, Burabe, Mustapha and Nuhu, 2018; Odoemelam and Alocha, 2015; Wulystan, 2018; Oriakhi and Okoedo-Okojie, 2013). The selection of an information source depends on a number of factors; including level of income, farm size, age, geographical location, level of education (Riesenberg and Gor, 1999). Using the Indian NSSO 2003 survey, Adhiguru, Birthal and Kumar (2009) found that small and marginal farmers accessed less information and from fewer sources than medium and large Scale farmers. Ogboma (2010), Babu, Glendenning, Asenso-Okyere & Govindarajan (2011), Meitei and Devi (2009), and Mtega and Benard (2013) have mentioned some information sources used by farmers in accessing their agricultural information including: newspapers, journals, bulletins, community leaders, and farmer groups.

Another study by Daudu, Chado & Igbashal (2009) revealed that farmers used agricultural extensions, posters, televisions, and radios as their source of information. Ogboma (2010) noted the sources of information used by rice farmers were personal experience, workshops and Seminars, training, friends and neighbours, Ministry of agriculture, magazines of agriculture, extension officers, local Government officers, non-Government organization, libraries of agriculture and posters. Bozi and Ozcatalbas (2010) and Yohanna, Ndaghu & Barnabas (2014) in their separate study revealed that family members, neighbour farmers, extension services, input providers and mass media were key sources of information for Turkish farmers. According to the study conducted by Asa and Uwem (2017), majority of the respondents (98.7%) had access to mobile phones in the study area and majority of them (90.5%) actually owned mobile phones. Meanwhile, Kursat, Huseyin, Vedat, Savas & Osman (2008, in their study concluded that lack of information support from the institutional sources resulted in the development of personal information sources to exchange information and diffuse

technology among the farmers themselves.

The challenges in accessing agricultural information by farmers have been revealed in previous studies (Tologbonse, Fashola & Obadiah, 2008; Adegebo, 2016; Ogar, Dika and Atanda, 2018; Ifejika, 2016; Toluwase and Apata, 2017; Byamugisha, Ikoja-Odongo, Nasinyama & Lwasa, 2008; Aina, 2004; Owolade and Kayode, 2012; Babu, Glendenning, Asenso-Okyere & Govindarajan, 2011; Mtega and Benard, 2013, Mbagwu, Benson and Onuoha, 2018; Awili, White and Kimotho, 2016; Thuo, 2018; Abdul-Aziz and Baba, 2017; Oladimeji, 2006). Tologbonse, Fashola & Obadiah (2008), in their study revealed that the challenges facing farmers in accessing agricultural information were outdated information, language barrier, lack of awareness on existence of different information sources, lack of funds to acquire information and poor format of information carriers. The study by Daudu (2009) pointed out some of the problems encountered by farmers in Nigeria in accessing agricultural information such as financial problems, inadequacy of facilities/professionals, incomplete or irrelevant information. Adegebo (2016) and Ifejika (2016) in their separate study revealed that irregular visits by extension agents, inadequate knowledge and skill, poor loan access, poor radio transmission signals and network services, and poor electricity supply were some of the constraints hindering their access to agricultural information. Ogar, Dika and Atanda (2018), in their study have identified wild spread of illiteracy, poverty, hunger, and disease, absence of basic infrastructure such as water, roads, schools, electricity and health services as having negative impact on agriculture and rural development.

Theoretical Framework

This study is anchored on the diffusion of innovations theory propounded by B. Ryan and N. Cross (1943); Everett Rogers (1960), showing how information spreads to the users and the way the information transmitted enables the user to become aware of an innovation and embraces it. Bittner (2003) in Anaeto, Onabajo and Osifeso (2008) opines that, in the innovation diffusion process, the media presents information that makes us aware of the existence of an item. From there, the person gets interested, constantly evaluates the item, takes a trial of the item and finally acquires it. This theory is relevant to the current study because it guides us to understanding how access to agricultural information through the relevant and appropriate channels of communication among crop farmers is essential in making them aware of the innovations in agriculture that can enhance the production of food crops sufficient enough to avert the impending food crisis due to the outbreak of the COVID-19 in Nigeria.

RESEARCH METHODOLOGY

Survey research design was adopted and the questionnaire was used as the research instrument for data collection in this study. Survey research was used because it enabled us to access a large amount of the quantitative data from the respondents. The population of the study comprised crop farmers across the six geo-political zones of Nigeria. Registered crop farmers from one state in each of the six geo-political zones of the country formed the population of the study as thus: (i) Oyo- 401384, (ii) Enugu- 288611, (iii) Edo- 227166, (iv) Kaduna- 798640, (v) Bauchi- 639170, and (vi) Plateau- 353719 (National Bureau of Statistics, 2012). Therefore, the population of the study comprised 2, 708, 690 registered crop farmers in Nigeria. The sample size of the study was 1067 which was determined using Qualtrics^{XM} online sample size calculator under the confidence level of 95% and 3% error margin (https://www.qualtrics.com/experience-management/research/determine-sample-size'). Stratified sampling technique was used to group the country into six zones based on the already existing

stratifications, after which purposive sampling technique was used to select one state from each of the strata. Purposive sampling technique was used because it enabled us to select one state from each geopolitical zone that was agrarian in nature and crop farmers were most affected by the COVID-19 pandemic as at the time of the study. Based on this, the states sampled in the study were (i) Oyo (South West), (ii) Enugu (South East), (iii) Edo (South South), (iv) Kaduna (North West), (v) Bauchi (North East), and (vi) Plateau (North Central). Respondents were sampled proportionate to the population size of each state using the formula thus:

$$\frac{S \times n}{N}$$

Where;

S = Size of State

n = Sample Size

N = Total Population

Bauchi $\frac{639170}{2708690} X \frac{1067}{1} = 252$

Kaduna $\frac{798640}{2708690} X \frac{1067}{1} = 315$

Plateau $\frac{353719}{2708690} X \frac{1067}{1} = 139$

Enugu $\frac{288611}{2708690} X \frac{1067}{1} = 114$

Oyo $\frac{401384}{2708690} X \frac{1067}{1} = 158$

Edo $\frac{227166}{2708690} X \frac{1067}{1} = 89$

Based on the proportionate sampling technique used, 252 respondents were sampled in Bauchi State, 315 in Kaduna, 139 in Plateau, 114 in Enugu State, 158 in Oyo, and 89 respondents in Edo State. The research instrument used in the study was the questionnaire which was administered on the respondents through face-to-face using the research assistants in the area who were trained how to carry out the exercise. Data in this study were collected through primary and secondary sources. Under primary sources, the questionnaire was used for data collection, while journal articles, books, Internet and materials were used as sources of the data under secondary sources of the data collection. The data collected were analysed using a descriptive method. Multivariate Frequency Distribution Tables and SPSS were used as statistical tools for data analysis under descriptive method.

RESULTS AND DISCUSSION

A total of 1032 representing (96.7%) out of the 1067 copies of the questionnaire administered on the respondents returned in good shape for analysis while 35 copies representing (3.3%) suffered mortality because some copies of the questionnaire were not returned while others were returned

but not suitable to be used for analysis because they were wrongly completed by the respondents. The breakdown of the number of the questionnaire returned and not returned according to the States sampled in the study is as follows: In Bauchi, 244 (97.8%) returned while 8 (3.2%) out of the 252 copies of the questionnaire administered on the respondents suffered mortality; in Kaduna, 306 (97.1%) copies were returned for analysis while 9 (2.9%) out of the 315 copies suffered mortality; in Plateau, 132 (95.0%) copies were returned while 7 (5.0%) suffered mortality; in Enugu, 111 (97.4%) copies returned while 3 (2.6%) suffered mortality; in Oyo, 153 (96.8%) copies returned while 5 (3.3%) suffered mortality; while in Edo State, 86 (96.6%) copies returned while 3 (3.4%) suffered mortality. Therefore, the 1032 representing 96.7% return rate out of the 1067 copies of the questionnaire administered on the respondents is significant enough and therefore formed the basis for analysis in this study while the mortality rate of 35 representing 3.3% is regarded insignificant to affect the data for this study. The analysis of this study is therefore based on the 96.7 percent rate of the questionnaire returned in the study which is 1032.

Table 1: Kinds of Agricultural Information Crop Farmers Access for Enhanced Food Security in the COVID-19 era in Nigeria

Variable	No. of Respondents												Total	
	Bauchi		Kaduna		Plateau		Enugu		Oyo		Edo			
Fertilizer application	65	26.6	81	26.5	35	26.5	32	28.8	37	24.2	25	29.1	**275**	**26.6**
Agriculture loans	15	6.1	25	8.2	9	6.8	7	6.3	16	10.5	9	10.5	**81**	**7.8**
Weed control	35	14.3	44	14.4	19	14.4	17	15.3	21	13.7	13	15.1	**149**	**14.4**
Pest control°	13	5.3	15	4.9	5	3.8	3	2.7	5	3.3	3	3.5	**44**	**4.3**
Seed selection	9	3.7	11	3.6	3	2.3	2	1.8	3	2.0	1	1.2	**29**	**2.8**
Agric marketing	21	8.6	23	7.5	13	9.8	12	10.8	15	9.8	5	5.8	**89**	**8.6**
Crop rotation practices	7	2.9	9	2.9	2	1.5	1	0.9	5	3.3	2	2.3	**26**	**2.5**
Land preparation	10	4.1	12	3.9	4	3.0	6	5.4	11	7.2	4	4.7	**47**	**4.6**
Disease control and treatment	15	6.1	17	5.6	6	4.5	4	3.6	6	3.9	3	3.5	**51**	**4.9**
Storage methods	21	8.6	31	10.1	13	9.8	9	8.1	14	9.2	9	10.5	**97**	**9.4**
Farm irrigation	11	4.5	10	3.3	5	3.8	3	2.7	4	2.6	1	1.2	**34**	**3.3**
Planting methods	9	3.7	11	3.6	7	5.3	4	3.6	3	2.0	3	3.5	**37**	**3.6**
Farm mechanization	13	5.3	17	5.6	11	8.3	11	9.9	13	8.5	8	9.3	**73**	**7.1**
Total	**244**	**100**	**306**	**100**	**132**	**100**	**111**	**100**	**153**	**100**	**86**	**100**	**1032**	**100**

Source: Field Survey, 2020.

Table one is concerned with the kinds of agricultural information crop farmers have access to for enhanced food security in the COVID-19 pandemic era in Nigeria. Data revealed that 26.6% out of the total number of respondents sampled said fertilizer application was one of agricultural information accessible to them with Edo crop farmers having the highest response rate, 7.8% out of the respondents were of the opinion that information on agricultural loan was accessible to them, 14.4% of the respondents said information on weed control was accessible to them, 4.3% of the respondents were of the opinion that pest control information was accessible to them, 2.8% of the respondents were of the opinion that information on seed selection was accessible to them, 8.6% of the respondents accessed information on agric marketing, 2.5% of the respondents accessed information on crop rotation practices, 4.6% of the respondents accessed information on land preparation, 4.9% of the respondents accessed information on disease control and treatment, 9.4% of the respondents accessed information on storage methods, 3.3% of the respondents accessed information on farm irrigation, 3.6% of the respondents have access to agricultural information on planting methods, while 7.1% of the respondents accessed information on farm mechanization.

The result above implies that crop farmers accessed different kinds of agricultural information in the era of the COVID-19 pandemic but information on fertilizer application was more accessible to them, followed by the one on weed control, while information on loans application, pest control, seed selection, agric marketing, crop rotation, land preparation, disease control and treatment, crop storage methods, farm irrigation, planting methods and farm mechanization were least accessed by them. This finding agrees with previous scholars which pointed out different agricultural information accessible to the respondents (Lughlugh, 2020; Olaniyi and Ogunkunle, 2018; Baba, 2018; Abdu`Rahman, 2018; Ifejika, 2016; Odoemelam and Olojede, 2016; Idiake-Ochei, Onemolease & Erie, 2016; Oyeniyi and Olofinsawe, 2015; Salau, Saingbe and Garba, 2014; Ezeh, 2013; Ayubu, Malongo, Siza & Respickius, 2012). Many of these studies indicated that farmers access information in fewer areas than they do in many other areas.

Table 2: Kinds of Food Crop Farmers Access Information on for Enhanced Food Security in the COVID-19 era in Nigeria

Variable	No. of Respondents												Total	
	Bauchi		Kaduna		Plateau		Enugu		Oyo		Edo			
Yam	16	6.6	25	8.2	11	8.3	13	11.7	27	17.6	18	20.9	110	10.7
Maize	32	13.1	90	29.4	26	19.7	21	18.9	29	19.0	21	24.4	219	21.2
Rice	34	13.9	21	6.9	22	16.7	14	12.6	19	12.4	15	17.4	125	12.1
Sorghum	27	11.1	28	9.2	5	3.8	2	1.8	2	1.3	1	1.2	65	6.3
Soybean	17	7.0	13	4.2	3	2.3	3	2.7	5	3.3	2	2.3	43	4.2
Potato	19	7.8	11	3.6	21	15.9	4	3.6	9	5.9	1	1.2	65	6.3
Cassava	15	6.1	19	6.2	4	3.0	29	26.1	21	13.7	16	18.6	104	10.1
Wheat	18	7.4	23	7.5	5	3.8	3	2.7	5	3.3	1	1.2	55	5.3
Beans	25	10.2	35	11.4	19	14.4	6	5.4	6	3.9	2	2.3	93	9.0
Guinea corn	14	5.7	19	6.2	6	4.5	5	4.5	7	4.6	1	1.2	52	5.0
Millet	16	6.6	9	2.9	3	2.3	3	2.7	18	11.8	1	1.2	50	4.8
Others	11	4.5	13	4.2	7	5.3	8	7.2	5	3.3	7	8.1	51	4.9
Total	**244**	**100**	**306**	**100**	**132**	**100**	**111**	**100**	**153**	**100**	**86**	**100**	**1032**	**100**

Source: Field Survey, 2020.

Table two is concerned with the kinds of food crops that farmers access information on in the COVID-19 era in Nigeria. Data revealed that 10.7% of the respondents accessed information on yam crop, 21.2% of the respondents accessed on maize crop, 12.2% of the respondents accessed on rice crop, 6.3% of the respondents accessed on sorghum crop, 4.2% of the respondents accessed information on soybean crop, 6.3% of the respondents accessed information on potato crop, 10.1% of the respondents accessed information on cassava crop, 5.3% of the respondents accessed information on wheat, 9.0% of the respondents accessed information on beans crop, 5.0% of the respondents accessed information on guinea corn crop, 4.8% of the respondents accessed information on millet, while 4.9% accessed information on other crops not mentioned here.

It implies therefore that information on maize crop was more accessible to crop farmers follow by rice, yam and cassava, while information on sorghum, soybean, potato, wheat, beans, guinea corn and millet were least accessible to crop farmers in the COVID-19 pandemic era in Nigeria. A study conducted by Adetimehin, Okunlola and Owolabi (2018) revealed that farmers in the study area have a variety of information on rice production including information on pests and diseases management practices, mechanical land preparation and planting, use of farm machines, improved storage methods and agricultural credit/loan. Olajide's (2015) study which was on food crops generally revealed that crop farmers had adequate access to information on land preparation, organic farming and harvesting of crops.

Table 3: Sources Crop Farmers access Agricultural Information from for Enhanced Food Security in the COVID-19 era in Nigeria

Variable	No. of Respondents												Total	
	Bauchi		Kaduna		Plateau		Enugu		Oyo		Edo			
Radio	30	12.3	41	13.4	16	12.1	14	12.6	19	12.4	11	12.8	131	12.7
Television	11	4.5	17	5.6	6	4.5	3	2.7	7	4.6	5	5.8	49	4.7
Newspaper	7	2.9	11	3.6	4	3.0	2	1.8	3	2.0	4	4.7	31	3.0
Magazine	3	1.2	6	2.0	2	1.5	1	0.9	2	1.3	1	1.2	15	1.5
Mobile phones	33	13.5	43	14.1	18	13.6	16	14.4	22	14.4	13	15.1	145	14.1
Social media platforms	21	8.6	23	7.5	11	8.3	7	6.3	9	5.9	5	5.8	76	7.4
Posters	6	2.5	9	2.9	3	2.3	1	0.9	2	1.3	2	2.3	23	2.2
Agriculture Extension Officers	4	1.6	7	2.3	2	1.5	1	0.9	3	2.0	1	1.2	18	1.7
Family members	52	21.3	59	19.3	29	22.0	29	26.1	39	25.5	18	20.9	226	21.9
Fellow farmers	41	16.8	47	15.4	22	16.7	21	18.9	28	18.3	16	18.6	175	17.0
Village leaders	13	5.3	14	4.6	5	3.8	3	2.7	4	2.6	2	2.3	41	4.0
Farmers' clubs/Associations	3	1.2	5	1.6	2	1.5	1	0.9	2	1.3	1	1.2	14	1.4
Churches/Mosques	19	7.8	21	6.9	11	8.3	9	8.1	11	7.2	5	5.8	76	7.4
Community libraries	1	0.4	3	1.0	1	0.8	3	2.7	2	1.3	2	2.3	12	1.2
Total	**244**	**100**	**306**	**100**	**132**	**100**	**111**	**100**	**153**	**100**	**86**	**100**	**1032**	**100**

Source: Field Survey, 2020.

Table three is concerned with how crop farmers access their information for enhanced food security in the COVID-19 era in Nigeria. Data available revealed that 12.7% of the respondents accessed agricultural information through the radio, 4.7% of the respondents accessed through television, 3.0% of the respondents accessed through the newspaper, 1.5% of the respondents accessed through the magazine, 14.1% of the respondents said they access agricultural information through their mobile phones, 7.4% of the respondents accessed their agricultural information to enhance food security through the social media, 2.2% of the respondents accessed agricultural information through posters, 1.7% of the respondents accessed their agricultural information through agriculture extension officers, 21.9% of the respondents accessed agricultural information through family members, 17.0% of the respondents accessed through follow farmers, 4.0% of the respondents accessed agricultural information through village leaders, 1.4% of the respondents accessed through farmers' clubs/associations, 7.4% of the respondents accessed through Churches/Mosques, while 1.2% of the respondents accessed through community libraries.

It means therefore that crop farmers access the agricultural information through different sources but the most accessible sources to them was family members followed by fellow farmers and mobile phones, while the radio, television, newspaper, magazine, mobile phones, social media platforms, posters, agriculture extension officers, village leaders, farmers' clubs/associations, Churches/Mosques, and community libraries the least accessible sources of agricultural information to crop farmers for enhanced food security in the era of COVID-19 in Nigeria. This finding is in tandem with the findings from different previous studies which revealed that farmers obtain agricultural information through different sources even though some sources are more accessible to farmers than others (Kursat, Huseyin, Vedat, Savas & Osman, 2008; Bozi and Ozcatalbas, 2010; Yohanna, Ndaghu & Barnabas, 2014; Ogunsola, Ogunsola, Alarape, Oloba & Osalusi (2019); Olaniyi and Ogunkunle (2018); Ha, Okigbo and Igboaka, 2008; Ekoja, 2003; Pamphily, Harrison and Emily, 2017; Odoemelam and Alocha, 2015; Kursat, Huseyin, Vedat, Savas & Osman, 2008). Kursat, Huseyin, Vedat, Savas & Osman (2008) in their study, for instance, concluded that lack of information support from the institutional sources resulted in the development of personal information sources to exchange information and diffuse technology among the farmers themselves.

Table 4: Source of Agricultural Information more Credible for Crop Farmers in the Era of COVID-19 in Nigeria

Variable	No. of Respondents												Total	
	Bauchi		Kaduna		Plateau		Enugu		Oyo		Edo			
Radio	45	18.4	63	20.6	29	22.0	29	26.1	37	24.2	18	20.9	221	21.4
Television	33	13.5	35	11.4	18	13.6	16	14.4	19	12.4	14	16.3	135	13.1
Newspaper	12	4.9	15	4.9	5	3.8	3	2.7	5	3.3	4	4.7	44	4.3
Magazine	9	3.7	5	1.6	2	1.5	1	0.9	3	2.0	2	2.3	22	2.1
Mobile phones	19	7.8	23	7.5	9	6.8	7	6.3	8	5.2	6	7.0	72	7.0
Social media platforms	7	2.9	11	3.6	7	5.3	5	4.5	7	4.6	4	4.7	41	4.0

Posters	5	2.0	7	2.3	3	2.3	1	0.9	3	2.0	1	1.2	20	1.9
Agriculture Extension Officers	35	14.3	47	15.4	24	18.2	24	21.6	30	19.6	16	18.6	176	17.1
Family members	23	9.4	26	8.5	9	6.8	6	5.4	8	5.2	5	5.8	77	7.5
Fellow farmers	11	4.5	17	5.6	5	3.8	3	2.7	5	3.3	3	3.5	44	4.3
Village leaders	15	6.1	18	5.9	7	5.3	5	4.5	6	3.9	4	4.7	55	5.3
Farmers' clubs/Associations	9	3.7	13	4.2	4	3.0	2	1.8	3	2.0	1	1.2	32	3.1
Churches/Mosques	19	7.8	23	7.5	9	6.8	8	7.2	16	10.5	7	8.1	82	7.9
Community libraries	2	0.8	3	1.0	1	0.8	1	0.9	3	2.0	1	1.2	11	1.1
Total	**244**	**100**	**306**	**100**	**132**	**100**	**111**	**100**	**153**	**100**	**86**	**100**	**1032**	**100**

Source: Field Survey, 2020.

Table four is concerned with the sources of agricultural information more credible for enhanced food security crop farmers in the COVID-19 era in Nigeria. Data revealed that 21.4% respondents said radio was more credible among the sources of agricultural information accessible to them, 13.1% respondents said television was more credible among the sources of agricultural information accessible to them, 2.1% of the respondents were of the opinion that magazine was more credible among the sources of agricultural information accessible to them, 7.0% of the respondents said more phones were more credible as sources of agricultural information to enhance food security, 4.0% of the respondents were of the opinion that social media platforms were more credible to them, 1.9% of the respondents said poster was more credible, 17.1% of the respondents said agriculture extension officers were sources more credible among the accessible sources, 7.5% of the respondents said family members were the sources more credible for them, 4.3% of the respondents were of the opinion that fellow farmers were the sources more credible for them, 5.3% of the respondents said village leaders were more credible as sources of agricultural information to enhance food security for them, 3.1% of the respondents said farmers' club/associations were the sources more credible for them, 7.9% of the respondents said Churches/Mosques were the sources more credible for them, while 1.1% of the respondents said community libraries was more credible for them to be used to enhance food security in the COVID-19 era in Nigeria.

This implies that crop farmers have various credible sources of agricultural information to enhance food security in the COVID-19 era in Nigeria, but radio is more credible for them followed by agriculture extension officers and television. This finding agrees with the one by Olajide (2015) which revealed that crop farmers had adequate access to information and adjudged information from the broadcast media as appropriate for crop production more than other sources. Oriakhi and Okoedo-Okojie (2013) revealed in their study that crop farmers preferred radio as the most used channel of agricultural information to other sources.

Table 5: The Extent Cop Farmers are satisfied with the Kinds of Agricultural Information Accessible to them for enhanced Food Security in the COVID-19 era in Nigeria

Variable	No. of Respondents												Total	
	Bauchi		Kaduna		Plateau		Enugu		Oyo		Edo			
To a great Extent	41	16.8	54	17.6	21	15.9	16	14.4	25	16.3	13	15.1	170	16.5
To a little extent	195	79.9	241	78.8	108	81.8	91	82.0	121	79.1	71	82.6	827	80.1
Difficult to say	8	3.3	11	3.6	3	2.3	4	3.6	7	4.6	2	2.3	35	3.4
Total	244	100	306	100	132	100	111	100	153	100	86	100	1032	100

Source: Field Survey, 2020.

Table five is on the extent to which crop farmers are satisfied with the kinds of agricultural information accessible to them to enhance food security in the COVID-19 era in Nigeria. Data revealed that 16.1% out of the respondents sampled in the study said they were satisfied with the extent to which agricultural information was accessible to them to a great extent, 80.1% of them were satisfied to a little extent, while 3.4% of them found it difficult to comment. It implies therefore that farmers have access to agricultural information but to a little extent. This finding reminds us about the observation by Moore (2007) and Odini (2005) that access to the right information by farmers can help them to acquire the skills, knowledge and confidence to participate fully in agricultural affairs, and according to Abdu`Rahman (2018), limited access to agricultural information is one of the key factors that have narrowed agricultural development in the developing countries.

Table 6: Ways Crop Farmers make use of the Agricultural Information to Improve Crops Production and enhance Food Security in the COVID-19 era in Nigeria

Variable	No. of Respondents												Total	
	Bauchi		Kaduna		Plateau		Enugu		Oyo		Edo			
Involve in timely fertilizer application	43	17.6	67	21.9	31	23.5	29	26.1	41	26.8	27	31.4	238	23.1
Apply for agricultural loans	15	6.1	17	5.6	11	8.3	11	9.9	13	8.5	9	10.5	76	7.4
Engage in early weed control	31	12.7	38	12.4	16	12.1	15	13.5	27	17.6	13	15.1	140	13.6
Engage in early pest control	17	7.0	19	6.2	7	5.3	5	4.5	8	5.2	5	5.8	61	5.9
Select appropriate seeds	19	7.8	21	6.9	8	6.1	6	5.4	5	3.3	3	3.5	62	6.0
Involve in agric marketing	23	9.4	25	8.2	11	8.3	7	6.3	6	3.9	4	4.7	76	7.4
Involve in the practice of crop rotation	13	5.3	15	4.9	5	3.8	3	2.7	5	3.3	2	2.3	43	4.2

Engage in early land preparation	16	6.6	18	5.9	8	6.1	5	4.5	6	3.9	1	1.2	54	5.2
Engage in early disease control and treatment	9	3.7	13	4.2	5	3.8	3	2.7	4	2.6	4	4.7	38	3.7
Involve in crop storage	21	8.6	24	7.8	10	7.6	14	12.6	21	13.7	8	9.3	98	9.5
Engage in farm irrigation	9	3.7	11	3.6	6	4.5	4	3.6	5	3.3	3	3.5	38	3.7
Engage in early planting	17	7.0	25	8.2	9	6.8	6	5.4	7	4.6	4	4.7	68	6.6
Involve in farm mechanization	11	4.5	13	4.2	5	3.8	3	2.7	5	3.3	3	3.5	40	3.9
Total	**244**	**100**	**306**	**100**	**132**	**100**	**111**	**100**	**153**	**100**	**86**	**100**	1032	**100**

Source: Field Survey, 2020.

Table six which is about the ways crop farmers utilize the agricultural information they accessed to improve crop production for enhanced food security in the COVID-19 era in Nigeria revealed that 23.1% of the respondents have made use of the agricultural information they accessible to involve in timely fertilizer application, 7.4% of them made use of the information accessible to apply for agricultural loans, 13.6% of the respondents have made use of the information accessible to engage in early control of weeds, 5.9% of the respondents have made use of the information accessible to engage in early pest control, 6.0% of the respondents made use of the information to select appropriate seeds, 7.4% of the respondents made use of the information to involve in agric marketing, 4.2% of them made use of the information to engage in the practice of crop rotation, 5.2% of the respondents made use of the information to engage in early land preparation, 3.7% of the respondents engaged in early disease control and treatment, 9.5% of the respondents engaged in crop storage, 3.7% of them engaged in farm irrigation, 6.6% of the respondents engaged in early planting, while 3.9% of them engaged in farm mechanization due to the information accessible to them.

This implies that agricultural information accessible to crop farmers is used in different ways to enhance food security in the COVID-19 era but most particularly in the area of timely fertilizer application and early control of weeds. However, there is still low usage of agricultural information by crop farmers in areas such as the loans application, pest control, seed selection, agric marketing, crop rotation practices, land preparation, disease control and treatment, crop storage, farm irrigation, planting, and farm mechanization. This finding agrees with the diffusion of innovations theory which reveals how information spreads to the users and the way the information transmitted enables the user to become aware of an innovation and embraces it (Ryan and Cross, 1943; Rogers, 1960 in Anaeto, Onabajo and Osifeso, 2008). Bittner (2003) in Anaeto, Onabajo and Osifeso (2008) hold that, in the innovation diffusion process, the media presents information that makes us aware of the existence of an item. From there, the person gets interested, constantly evaluates the item, takes a trial of the item and finally acquires it, which in this case is the agricultural information among crop farmers.

CONCLUSION

Information on fertilizer application was more accessible to crop farmers followed by weed control, while information on loans application, pest control, seed selection, agric marketing, crop rotation, land preparation, disease control and treatment, crop storage methods, farm irrigation, planting methods and farm mechanization were less accessible by them for enhanced food security in the era of COVID-19 in Nigeria. The crops these farmers accessed information on more predominantly were maize, followed by rice, yam and cassava, while information on sorghum, soybean, potato, wheat, beans, guinea corn and millet was least accessed by them for enhanced food security in the COVID-19 era in Nigeria.

The different kinds of information crop farmers accessed on different crops were predominantly through family members followed by fellow farmers and mobile phones, while the radio, television, newspaper, magazine, mobile phones, social media platforms, pósters, agriculture extension officers, village leaders, farmers' clubs/associations, Churches/Mosques, and community libraries were the least accessible sources of agricultural information to crop farmers for enhanced food security in the era of COVID-19 in Nigeria. However, radio was adjudged the most credible source of agricultural information followed by agriculture extension officers and television among the sources for enhanced food security in the era.

Crop farmers were satisfied with the agricultural information accessible to them but that satisfaction was to a little extent. The information accessible to crop farmers enabled them to engage in timely fertilizer application and early control of weeds more while their involvement in loans application, pest control, seed selection, agric marketing, crop rotation practices, land preparation, disease control and treatment, crop storage, farm irrigation, planting, and farm mechanization was low.

Further, access to adequate and useful agricultural information by crop farmers is essential for enhanced food production as inadequate access to such information will result to poor application of agricultural innovations capable of preventing a society from attaining food sufficiency and security level.

RECOMMENDATIONS

i. Crop farmers in Nigeria should increase their level of access to agricultural information through prioritizing every information beneficial for improving the production of agriculture, if the goal of overcoming the threat to food security due to the COVID-19 in the country is to be overcome.

ii. Sources of agricultural information adjudged more credible and professional agricultural by crop farmers such as the radio and agriculture extension officers should be made more available for them to access for more in depth knowledge about the innovations in agriculture for more adoption for enhanced food security in the COVID-19 pandemic.

iii. Farmers should be trained through workshops and seminars (though with strict adherence to COVID-19 guidelines) to enhance their capacity to be a more credible source of information for others to enhance food security in the COVID-19 era in Nigeria.

REFERENCES

Abdu`Rahmfan, B. S. (2018). Review on the Information Needs and Sources of Information for Agricultural Development in Developing Countries. *International Journal of Innovative Research and Development*, 7(12), 73-79, also available at www.ijird.com.

Abdul-Aziz, H. and Baba, D. (2017). An Appraisal of Farmers Internet Use for Sourcing Agricultural Information in NorthWestern Nigeria. *SHS Web of Conferences* 33. Retrieved on June 19, 2020 from http://creativecommons.org/licenses/by/4.0/.

Acheampong, D. L., Frimpong, N. B. Asante, D. M. (2017). Assessing the information seeking behaviour and utilization of rice farmers in the Ejisu-Juaben municipality of Ashanti Region of Ghana. *Business*, DOI:10.1186/s40066-017-0114-8

Adegboye, G. A., Oyinbo, O., Owolabi, J. O. & Hassan, O. S. (2013). Analysis of the Sources and Effect of Extension Information on Output of Women Maize Farmers in Soba Local Government Area of Kaduna State, Nigeria. *European Scientific Journal*, 9(9), 210-217.

Adegebo, A. A. (2016). Knowledge, Attitude and Use of Agricultural Information as Predictors of Increased Productivity among Small Scale Farmers in Southwestern, Nigeria. A Thesis in the Department of Adult Education in fulfillment of the requirements for the Degree of Doctor of Philosophy of the University of Ibadan.

Adetimehin, D. O., Okunlola, O. J. and Owolabi, E. K. (2018). Utilization of Agricultural Information and Knowledge for Improved Production by Rice Farmers in Ondo State, Nigeria. *Journal of Rural Social Sciences*, 33(1), 76-100.

Adhiguru, P., Birthal, P. S. & Kumar, B. G. (2009). Strengthen. pluralistic agricultural information delivery systems in India, Agricultural Economics Research Reviews, 22,71-79. Available at http://ageconsearch.umn.edu/bitstream/57382/2/5- PAdhiguru.pdf.

Adio, E.O; Abu, Y; Yusufu, S. K. and Nansoh, S. (2016). Use of Agricultural Information Sources and Services by Farmers for Improve Productivity in Kwara State. *Library Philosophy and Practice* (e-journal). 1456. Retrieved on June 18, 2020 from http://digitalcommons.unl.edu/libphilprac/1456.

Adomi, E.E., Ogbomo, M. O. and Inoni, M.O. (2003), Gender factor in crop farmers' access to agricultural information in rural areas of Delta State, Nigeria. *Library Review*, 52(8), 388-393.

AgREN (2000). Agricultural Knowledge and Information Systems in Kenya-implications for technology dissemination and development. *ODI, Agricultural Research and Extension Network Paper Number* 107, 20 Pages.

Ahmed, M. (2018). Accessibility and Utilization of Agricultural Information: The Role of Communication Media in the Delivery of Information to Farmers in Nigeria. *Information and Knowledge Management*, 8(10). Available at www.iiste.org.

Aina, L. O. (2004). Towards improving information access by semi and non literate groups in Africa: A need for empirical studies of their information seeking and retrieval patterns. In T. J. D. Bothma and A. Kaniki (eds). ProLISSA 2004: Proceedings of the 3rd Biennial DISSAnet Conference. Pretoria: Infuse, pp. 11–20.

Alemna, A. A. and Skouby K. E. (2000). An investigation into the Information Needs and Information- seeking behaviour of members of Ghana's legislature. *Library Management*, 21(5), 235-240.

Alimi, F. L., Olugbenga, O. A. and Ayoola, O. O. (2017). Elements of Rural Economics: Access to Agricultural Information among Rural Women Farmers in Abuja, Nigeria. *The Journal of Agricultural Sciences*, 12(2), 63-75.

Alunas, M. M. (2014). Assessment of the factors impacting agricultural extension training programs in Tanzania: A descriptive study. A thesis submitted to the graduate faculty in partial fulfillment of the requirements for the degree of Master of Science, Iowa State University.

Aminou, A., Guillaume, S., Patricio, M. and Matty, D. (2020). Policy options for mitigating impacts of COVID-19 on domestic rice value chains and food security in West Africa. Global Food Security, 26, https://doi.org/10.1016/j.gfs.2020.100405.

Anaeto, G. S., Onabajo, O. S., Osifeso, B. J. (2008). *Models and Theories of Communication*. Maryland: African Renaissance Books Incorporated.

Anju, D. and Satbir, S. (2017). Sources of Agricultural Information Accessed by Farmers in Haryana, India. *International Journal of Current Microbiology and Applied Sciences*, 6(12), 1559-1565.

Antidius, F. (2020). Information needs and sources on food and nutrition security among farmers in Chamwino District, Tanzania. *University of Dar es Salaam Library journal*. Retrieved n August 5, 2020 from *https://www.semanticscholar.org/paper/Information-needs-and-sources-on-food-and-nutrition-Fidelis/62b77a37b13f6538d34ad4e451af06b32b85e08b*

Anunobi, V. C., Ogbonna, A. U. & Osuchukwu, N. P. (2014). Information Needs of Rural Dwellers as a Measure of the Effectiveness of Library and Information Services Provision in Anambra State, Nigeria. *Journal of Applied Information Science and Technology*, 7(1), 35-45.

Asa, U. A. and Uwem, C. A. (2017). Utilization of Mobile Phones for Agricultural Purposes by Farmers in Itu Area, Nigeria. *European Scientific Journal*, 13(19), 395-402.

Awili, A. M., White, P. and Kimotho, S. (2016). Factors That Influence Effective Communication of Agricultural Information among Farmers-The Case of Farmers in South West Kisumu Ward, Kisumu County. *Journal of Developing Country Studies*, 1(1), 1-20.

Ayalew. A. W. (2017). The Effectiveness of Farmers Research Group Approach in Potato Technology Dissemination and Adoption Case Study of Western Part of Ethiopia. The Journal of Agricultural Extension, retrieved on August 5, 2020 from https://www.semanticscholar.org/paper/THE-EFFECTIVENESS-OF-FARMERS-RESEARCH-GROUP-IN-AND-Worku/5925b20490940c2e04475d624ce55cef153d1804

Ayubu, J. C., Malongo, R. S. M., Siza, D. T. & Respickius, C. (2012). Understanding Farmers Information Communication Strategies for Managing Climate Risks in Rural Semi-Arid Areas, Tanzania. *International Journal of Information and Communication Technology Research*, 2(11), 838-845.

Baba, S. A. (2018). Farmers' use of Global System for Mobile for Communication in the Fadama III Project in the Northern Senatorial Zone of Taraba State, Nigeria. *International Journal of Agriculture Innovations and Research*, 7(2), 144-149.

Babu, C. S., Glendenning, J. C., Kumar, S. & Govindarajan, T. (2012). Farmers' information needs and search behaviors: Case study in Tamil Nadu, India. *Agriculture & Food Security*, DOI:10.22004/AG.ECON.126226

Babu, S. C., Glendenning, C. J., Asenso-Okyere, K. & Govindarajan, S. K. (2011). Farmers' Information Needs and Search Behaviors: Case Study in Tamil Nadu, India, Report for International Food Policy Research Institute, Washington, DC.

Balkrishna, B. B. and Deshmukh, A. A. (2017). A Study on Role of Social Media in Agriculture Marketing and its Scope. *Global Journal of Management and Business Research: E Marketing*,7(1), 32-36.

Bankapur, V. M. and Bhavanishankar, N. B. (2018). Information Needs and Seeking Behaviour of Farmers in Bhutaramanahatti Village of Belagavi District in Karnataka State: A Study. *Journal of Emerging Technologies and Innovative Research* (JETIR), 5(7), 174-1477, also available at www.jetir.org.

Banmeke, T. O. A. and Ajayi, M. T. (2008). Farmers' Perception of the Agricultural Information Resource Centre at Ago-Are, Oyo State, Nigeria. *International Journal of Agricultural Economics & Rural Development*, 1(1), 22-29.

Banya, M. S. (2014). Dissemination of Agricultural Information to Rural Farmers: A Case Study of the Sustainable Land and Water Management Project in West Mamprusi. Dissertation in the University of Ghana, Legon for the Award of M. A. Communication Studies Degree. Retrieved June 19, 2020 from http://ugspace.ug.edu.gh.

Bello, M. and Obinne, C. P. O. (2012). Problems and Prospects of Agricultural Information Sources Utilization by Small Scale Farmers: A Case from Nasarawa State of Nigeria. *Journal of Communication*, 3(2), 91-98.

Bozi, I. and Ozcatalbas, O. (2010). Determining information sources used by crop producers: A case study of Gaziantep province in Turkey. *African Journal of Agricultural Research*, 5(10), 980-987.

Brhane, G., Mammo, Y. and Negusse, G. (2017). Sources of information and information seeking behavior of smallholder farmers of Tanqa Abergelle Wereda, central zone of Tigray, Ethiopia. Journal of *Agricultural Extension and Rural Development*, DOI:10.5897/JAERD2016.0850.

Byamugisha, H. M., Ikoja-Odongo, R., Nasinyama, G. W. & Lwasa, S. (2008). Information seeking and use among urban farmers in Kampala district, Uganda. Agricultural information and IT' proceedings of IAALD AFITA, 24 to 27August 2008, Tokyo University, Japan.

CGIAR (2020). Reducing COVID-19 Impact on Agriculture: Nigerian farmers to receive improved seeds. Retrieved on July 26, 2020 from : https://reliefweb.int/report/nigeria/reducing-covid-19-impact-agriculture-nigerian-farmers-receive-improved-seeds.

Charles, L. (2015). Effectiveness of Information Communication Technologies in Dissemination of Agricultural Information to Smallholder Farmers in Kilosa District, Tanzania. Thesis Submitted to the Directorate of Research and Graduate Training in Partial Fulfillment of the Requirements for the Award of a Master of Science in Agricultural Extension Education of Makerere University, Tanzania.

Chen, Z., Liu, C. & Yang, D. (2011). Information Poverty and Farmers' Information Right in China's Mountainous Rural Areas. Procedia Engineering. Retrieved on June 18, 2020, from www.sciencedirect.com/science/article/pii/S1877705811017371.

Cheunwattana, A. (1998). Information for rural development: A multiple-case study of library and information services to the rural communities in Thailand. Unpublished Doctoral Thesis, Indiana University, Indiana.

Community on World Food Security (2020) Impact of COVID-19 on Food Security and Nutrition (FSN), 1(24), Interim Issues Paper. Retrieved on August 11, 2020 from www.fao.org/cfs/cfs-hlpe.

Correa, A. F. (1995). Training of information providers for the rural context. In E. Johansson (ed) *Seminar on information provision to rural communities in Africa* (92–97). Sweden: Uppasala University Library.

Daudu, S. Chado, S.S. and Igbashal, A. A. (2009). Agricultural information sources utilized by farmers in Benue state, Nigeria. *Agriculture and Technology*, 5(1), 39-48. Available at http://patnsukjournal.net/Vol5No1/p5.pdf.

Demet, S., Nilay, C., Marco, S., and Tunç, M. (2016). A Comparative Study of Information-Seeking Behavior and Digital Information Needs of Farmers in Turkey and Sweden. International Journal of eBusiness and eGovernment Studies, 8(2), 18-33.

Diemer, N., Atuhaire, A., Fuhrimann, S. & Inauen, J. (2020). Smallholder farmers' information behavior differs for organic versus conventional pest management strategies: A qualitative study in Uganda. *Journal of Cleaner Production*, 257(1). Retrieved on August 1, 2020 from https://doi.org/10.1016/j.jclepro.2020.120465

Ehui, S. (2020). Protecting food security in Africa during COVID-19. Retrieved on August 11, 2020 from https://www.brookings.edu/blog/africa-in-focus/2020/05/14/protecting-food-security-in-africa-during-covid-19/

Ekoja, I. (2003). Farmer's access to agricultural information in Nigeria. *Bulletin of the American Society for Information Science and Technology*, 29(6), 21-23.

Ezeh, N. A. (2013). Access and application of information and communication technology (ICT) among farming households of south east Nigeria. *Agriculture and Biology Journal of North America*, 4(6), 605-616. Available Online: 2151-7525, doi:10.5251/abjna.2013.4.6.605.616, http://www.scihub.org/ABJNA.

Fahmida, H. (2015). Link Between Nutrition and Agriculture. The *Daily Star* News. Retrieved on June 18, 2020 from http://www.the dailystar.net/link-between-nutrition-and-agriculture.

Folitse, Y. B., Osei, K. S., Dzandu, P. L. & Obeng-Koranteng, G. (2016). Impact of Agricultural Radio Programmes on Livelihoods of Farmers: The Case of Royal FM in Brong-Ahafo Region, Ghana. *Journal of Sustainable Development in Africa*, 18(5), 100-114.

Ha, L., Okigbo, R. and Igboaka, P. (2008). Knowledge creation and dissemination in Sub-Saharan Africa. *Management Decision*, 46(3), 392-405.

Idiake-Ochei, O; Onemolease, E. A. and Erie, G. O. (2016). Information-Seeking Behaviour of Extension Personnel in Edo State, Nigeria. *Scholars Journal of Agriculture and Veterinary Sciences*, 3(4), 318-325.

Ifejika, P. I. (2016). 2Assessment of Fisherfolk Information Seeking Behaviour with Mobile Phone for Improve Extension and Advisory Services. *Journal of Agricultural Science*, 8(11), 170-178.

Ijiekhuamhen, O. P. and Omosekejimi, A. F. (2016). Rural Women and their Information Seeking Behavior. *Library Philosophy and Practice (e-journal)*, 4-6. Available at http://digitalcommons.unl.edu/libphilprac.

Isaya, L. E. (2015). Sources of Agricultural Information for Women Farmers in Hai and Kilosa Districts, Tanzania. Presented in Partial Fulfillment of the Requirements for the Degree Master of Science in the Graduate School of the Ohio State University.

Islam, M. S. and Ahmed, S. M. Z. (2012). The information needs and information-seeking behaviour of rural dwellers: A review of research. *International Federation of Library Associations and Institutions*, 38(2), 137–147.

Jeffcoat, C., Davis, A. F. & Hu, W. (2012). Willingness to pay for broadband access by Kentucky farmers. *Journal of Agricultural and Applied Economics*, 44(3), 323 -334.

Kalusopa, T. (2005). The challenges of utilizing Information Communication Technologies (ICTs) for the smallscale farmers in Zambia. *Library Hi Tech* 23, 414-424.

Kamba, M. A. (2009). Access to information: The dilemma for rural community development in Africa. Paper presented at 7th GLOBELICS Conference, October 6–8, Dakar, Senegal.

Kari, H. (2007). Availability and accessibility of ICT in the rural communities of Nigeria. *The Electronic Library*, 25(3), 363-372.

Kleih, U., Okoboi, G. and Janowski, M. (2004). Farmers and traders' sources of market information in Lira District. NARO Conference, 1-4 September 2004, Paper 57-5, 25 Pages. Retrieved on June 18, 2020, 2020 from http://www.dfid.gov.uk/r4d/PDF/Outputs/R8250s.pdf.

Kuria, W. C. (2014). Use of Social Media as a Source of Agricultural Information by SmallHolder Farmers: A Case Study of Lower Kabete, Kiambu County. A Research Project for the Award of the Degree of Master of Arts in Communication Studies, School of Journalism and Mass Communication, University of Nairobi.

Kursat, D., Huseyin, E., Vedat, C., Savas, A. & Osman, U. (2008). Agricultural information systems and communication networks: the case of dairy farmers in the Samsun province of Turkey. iRinformationresearch, *13(2). Retrieved on August 13, 2020 from* http://www.informationr.net/ir/13-2/paper343.html

Kusugh, T. (2017). *Mass Communication Research: Methods, Strategies and Procedure*. Makurdi: Obama Publishers.

Lisa Schlein, L. (2020). COVID-19 is Threatening Food Security in Nigeria. VOA. Retrieved on August 11, 2020 from https://www.voanews.com/africa/covid-19-threatening-food-security-nigeria.

Lughlugh, J. (2020). Information Needs and Information Seeking Behaviour of Farmers for Sustainable Agricultural Development in Benue State, Nigeria. *International Journal of Research and Innovation in Social Science (IJRISS)*, IV(V), 309-312.

Lwoga, E. T. (2010). Bridging the agricultural knowledge and information divide: the case of selected telecenters and rural radio in Tanzania. *The Electronic Journal on Information Systems in Developing Countries*, 43 (6), 1-14.

Lwoga, E. T. and Stilwell, C. (2011). Access and use of agricultural information and knowledge in Tanzania. *Library Review*, 60(5).

Mapiye, O., Makombe, G. & Dzama, K. (2020). Management information sources and communication strategies for commercially oriented smallholder beef cattle producers in Limpopo province, South Africa. *Outlook on Agriculture*, DOI:10.1177/0030727019860273

Mbagwu, C. F., Benson, O. V. and Onuoha, O. C. (2018). Challenges of meeting information needs of rural farmers through internet-based services: experiences from developing countries in Africa. Retrieved on June 18, 2020 from http://creativecommons.org/licenses/by/4.0.

Mbanda-Oburå, A. S., Tabu, M. I. & Obura, R. K. (2017). Determinants of Choice of Agricultural Information Sources and Pathways among Sorghum Farmers in Ndhiwa

Sub-County, Western Kenya. *The Journal of Agricultural Extension*. Retrieved on August 5, 2020 from https://www.semanticscholar.org/paper/DETERMINANTS-OF-CHOICE-OF-AGRICULTURAL-INFORMATION-Mbanda-Obura-Tabu/d2e8759e7bcf78d33a54d15989f404ab9fc967c5

Mchombu, K. J. (2006). Libraries, literacy and poverty reduction: a key to African Development. A research paper looking at libraries in Africa Commissioned by Book Aid International and sponsored by the Commonwealth Foundation.

Mehrad, J. and Tajer, P. (2016). Uses and gratification theory in connection with knowledge and information science: A proposed conceptual model. *International Journal of Information Science and Management*, 14(2), 1-14.

Meitei, L. S. and Devi, T. P. (2009). Farmers information needs in rural Manipur: An assessment. *Annals of Library and Information Studies*, 56, 35–40.

Meyers, C., Gracey, K., Irlbeck, E. & Akers, C. (2015). Exploring the Uses and Gratifications of Agricultural Blog Readers. Journal of Applied Communications, 99, (4), also available on https://doi.org/10.4148/1051-0834.1064.

Moore, N. (2007). Community information and technology centres: Focus on South-East Asia. Bangkok: UNESCO. Retrieved on June 18, 2020 from http://portal.unesco.org/ci/en/files/25659/ 11962595511telecentre_study_en.pdf/telecentre_study_ en.pdf.

Mtega, W. and Benard, R. (2013). The state of rural information and communication services in Tanzania: a meta-analysis. *International Journal of Information and Communication Technology Research*, 3(2), 64 – 73.

Mulauzi, F. and Zulu M. (2012). Information and Knowledge: A Panacea for Increased Food Security among Women in Chipata District: The Case of Luangeni. Social Policies and Social Development: OSSREA Zambia Chapter Academic Workshop Proceedings, University of Zambia Senate Chamber, Lusaka, Zambia, 15th October, 2012, pp.121-144.

Mwakaje, A. (2010). Information and Communication Technology for rural farmers market access in Tanzania. *Journal of Information Technology Impact*, 10(2), 111-128.

Mwangi, M. and Kariuki, S. (2015). Factors determining adoption of new agricultural technology by smallholder farmers in developing countries. *Journal of Economics and Sustainable Development*, 6(5), 208-216.

Nafiz, Z. S. (2016). The Information Practices of the Fishermen in the Bay of Bengal, Bangladesh. *Open Information Science*, 1, 21-40.

Obayori, B. J., Nchom, H. and Yusuf, L. O. (2020). Economics of Pandemic in Nigeria: The COVID-19 Experience. *British International Journal of Education and Social Sciences*, 7(4), 1-6.

Odini, S. (2005). Information seeking and communication behaviour of Kenya Railways Engineers. University of Dar es Salaam Journal 7(2).

Odoemelam, L. E. and Alocha, O. C. (2015). Understanding Farmers Information Network; Implication for Effective Extension Delivery in Akwa Ibom State. *International Journal of Scientific & Technology Research*, 4(1), 98-102.

Odoemelam, L. E. and Olojede, J. C. (2016). Analysis of Information Needs of Rural Youths on Garden Egg Production (*Solanum melongena*) in Abia State, Nigeria. *European Journal of Physical and Agricultural Sciences*, 4(3), 17-27.

Odoi, N. (2017). The information behaviour of Ugandan banana farmers in the context of participatory development communication. *Information Research*, 22(3). Retrieved on August 1, 2020 from http://www.informationr.net/ir/22-3/paper759.html

Ogar, E. C., Dika, I. S. and Atanda, A. L. (2018). Challenges and Prospects of Information Service Delivery to Rural People of Nigeria. *Research Journal of Library and Information Science*, 2(3), 14-28.

Ogboma, M. U. (2010). Access to agricultural information by fish farmers in the Niger delta region of Nigeria. *Journal of Library Philosophy and Practice*. Retrieved on June 18, 2020 from Available at ttp://www.faqs.org/periodicals/201009/2166597671.htm.

Ogunniyi, D. M. and Ojebuyi, B. R. (2020). Mobile Phone Use for Agribusiness by Farmers in Southwest Nigeria. *Journal of Agricultural Extension*, XX(X), 172-187. Available at http://dx.doi.org/10.4314/jae.v20i2.13.

Ogunsola, J.O., Ogunsola, A. J., Alarape, A. B., Oloba, O. G. and Osalusi, C. S. (2019). Effectiveness of broadcast Agricultural Programmes on Agricultural Development among Farmers in Akoko South West Local Government Area of Ondo state, Nigeria. *International Journal of Environment, Agriculture and Biotechnology (IJEAB)*, 4(5), 1392-1399. Available at https://dx.doi.org/10.22161/ijeab.45.16.

Oladimeji, I. O. (2006). Multilinguality of Farm Broadcast and Agricultural Information Access in Nigeria. Nordic Journal of African Studies, 15(2), 199-205.

Olajide B. R. (2015). Crop farmers' level of utilization of agricultural information from Agbe afokosoro radio farm broadcast in Ogun state, Nigeria. *International Journal of Agricultural Economics and Rural Development*, 7(1), 32-37.

Olajide, B. R. (2011). Assessment of Farmers' Access to Agricultural Information on Selected Food Crops in Iddo District of Oyo State, Nigeria. *Journal of Agricultural & Food Information*. Retrieved on August 5, 2020 from https://www.semanticscholar.org/paper/Assessment-of-Farmers.

Olaniyi, O. A. and Ogunkunle, T. (2018). Agricultural and Nutritional Information Needs of Arable Crop farmers in Ondo State Nigeria. *Journal of Agricultural Extension*, 22(3), 9-21. Also available at https://dx.doi.org/10.4314/jae.v22i3.2.

Olaniyi, O.A., Adebayo, O. O. and Akintola, S. (2011). Rural youth's perception and utilization of agricultural information in Oyo State, Nigeria. *J. Agric. Soc. Sci.*, 7, 117–123.

Olumuyiwa, A. O. and Tajudeen, O. (2018). Agricultural and nutritional information needs of arable crop farmers in Ondo State Nigeria. *The Journal of Agricultural Extension*. Retrieved on August 5, 2020 from https://www.semanticscholar.org/paper/Agricultural-and-nutritional-information-needs-of-Olaniyi-Ogunkunle/7a7fc37bb19d05b31fd07202e8469d0279a32f5e

Oluwatoyin, S. S. (2016). Analysis of Agricultural Communication for Improving Productivity among Rural Farmers in Odeda Local Government Area of Ogun State, Nigeria. A Dissertation Submitted to the School of Postgraduate Studies, Ahmadu Bello University, Zaria in Partial Fulfillment of the Requirements for the Award of Master of Science Degree in Mass Communication.

Omekwe, S., Omiekuma, P. and Obayori, B. J. (2020). The Effect of Coronavirus on Agriculture and Education in Nigeria. *Economics and Social Sciences Academic Journal*, 2(5), 31-38.

Omotayo, O. F. (2018). Information Behaviour of Nigerian Women Living in Rural Areas towards Socio Economic Empowerment-What do Women Want, What Should Women

Want? *JORIND*, 16(1). Also available at www.transcampus.org/journal; www.ajol.info/journals/jorind.

Opara, U. N. (2008). Agricultural information sources used by farmers in Imo State, Nigeria. *Information Development*, 24(4), 289-295.

Oriakhi, H. and Okoedo-Okojie, D. U. (2013). Arable Crop Farmers Preference for Agricultural Information Sources and Adoption of Technology in Edo State, Nigeria. *Journal of Agriculture and Veterinary Science*, 3(1), 31-35. Also available at www.iosrjournals.org.

Owolade, E. O. and Kayode, A. (2012). Information-Seeking Behavior and Utilization among Snail Farmers in Oyo State, Nigeria: Implications for Sustainable Animal Production. doi: 10.5191/jiaee.2012.19304, 19(3).

Oyeniyi,A. D. and Olofinsawe, A. A. (2015). Access and use of Agricultural Information Resources by Rural Women of Akure North and South Local Government areas of Ondo State Nigeria. *International Journal of Academic Library and Information Science*, 3(4), 132-138.

Padam, B. P., Mukti, R. P., Aasish, G., Samiksha, P., Chiran, K. T., Nisha, B. and Shila, B. (2020). COVID-19 and its Global Impact on Food and Agriculture. *Journal of Biology and Today's World*, 9(5), 1-4.

Pamphily, M., Harrison, B. and Emily, B. (2017). The means of access to agricultural information among farmers in Samia Sub-County, Kenya. *International Journal of Advanced Scientific Research*, 2(5), 12-18. Also available at www.allscientificjournal.com.

Riesenberg, L. E and Gor, C. O. (1999). Farmers' Preferences for Methods of receiving information on new or innovative farming practices. Graduate Student University of Idaho 5th April 2007. http://pubs.aged.tamu.edu/jae/pdf/vol30/30-03-07.pdf.

Salau, E. S., Saingbe, N. and Garba, M. (2014). Agricultural Information Needs of Small Holder Farmers in Central Agricultural Zone of Nasarawa State. retrieved on August 5, 2020 from https://www.semanticscholar.org/paper/Agricultural-Information-Needs-of-Small-Holder-in-Salau-Saingbe/c500adc11afb91185b51002b8c886e929fdde67d

Saleh, R. A., Burabe, I. B., Mustapha, S. B. and Nuhu, H. S. (2018). Utilization of Mass Media in Agricultural Extension Service Delivery in Nigeria: A Review. *International Journal of Scientific Studies*, 6(1), 43-52.

Sani, L. (2014). The generation and dissemination of agricultural information to Farmers in Nigeria: a review. *Journal of Agriculture and Veterinary Science*, 7(2), 102-111.

Sasakawa Africa Association (2020). Assessment of the Impact of COVID-19 on Food Systems in Africa and Recommended Mitigation Measures: Summary Findings. Sasakawa Africa Association, April-May, 2020.

Schmidhuber, J., Pound, J. and Qiao, B. (2020). COVID-19: Channels of transmission to food and agriculture. Food and Agricultural Organisation of the United Nations.

Shrama, A. K. and Fatima, N. (2004). Information-seeking behaviour and sharing pattern among the rural people of Gwalior district of Madhya Pradesh. In A. Chatterjee et al. (eds) *Information support for rural development*. Kolkata: IASLIC, 217–222.

Siatri, R. (1999). Evolution of user studies. *Libri*, 49, 132-141.

Singh K. P. and Satija M. P. (2006). A review of Research on Information Seeking Behaviour of Agricultural Scientists: International Perspectives. *DESIDOC Bulletin of Information Technology*, 26(2). P30.

Starasts, A. M. (2004). Battling the Knowledge factor: A Study of Farmers' Information Seeking Learning and Knowledge Process with an online environment in Queensland. Unpublished Ph.D Thesis.

Stienon, J., Bruinsma, W. and Neuman, F. (2017). How ICT can make a difference in agricultural livelihoods. Retrieved on June 18, 2020, from www.bibalex.org/Search4Dev/files/287913/118796.pdf.

Stringer, A. P., Robert, C. and Pinchbeck, G. L. (2019). Associations between sources of information and animal health knowledge of rural farmers in central Ethiopia. *The Journal of Agricultural Extension*, DOI:10.33687/IJAE.007.02.2857

Suleiman, M. M., Ogakason, R. O. & Faruk N. B. (2018). Influence of Social Media in Promoting Farmers' Participation in Agriculture. *Nigerian Journal of Agricultural Extension*, 19(1), 56-62.

Sunil, K., Sangeetha, V. and Shaik, N. M. (2018). Stakeholders' Information needs, Information Searching and Sharing Behaviour about Rice related Information through Rice Knowledge Management Portal. *International Journal of Current Microbiology and Applied Sciences*, 7(1) DOI:10.20546/ijcmas.2018.701.357

Tadesse, D. (2008). Access and Utilization of Agricultural Information by Resettler Farming Households: The Case of Metema Woreda, North Gondar, Ethiopia. A Thesis in The School of Graduate Studies, Department of Rural Development and Agricultural Extension, Haramaya University for The Degree of Master of Science in Agriculture (Rural Development And Agricultural Extension).

Thuo, W. M. (2018). Access and Use of Dairy Agricultural Information by Small Scale young Farmers in Murang'a County, Kenya. A Research Project Submitted in Partial/Fulfillment of the Degree of Master of Library and Information Science of Kenyatta University, Kenya.

Tologbonse, D., Fashola, O. & Obadiah, M (2008). Policy Issues in Meeting Rice Farmers Agricultural Information needs in Niger state. *Journal of agriculture extension*, 12(2). Also available at ajol.info/index.php/jae/article/view/47053/33437.

Toluwase S. O. W. and Apata O. M. (2017). Use of ICTs as a Source of Information for Improving Agricultural Productivity in South-West, Nigeria. *International Journal of Agricultural Economics*, 2(3), 50-54. doi: 10.11648/j.ijae.20170203.11.

Ugwoke, B. U. (2013). Promoting Nigerian Agriculture through Library and Information Services. *International Journal of Information Management*, 33, 564-566. Also available at www.sciencedirect.com/science/article/pii/S0268401213000352.

Ukachi, N. B. (2007). Information needs, Sources and Information Seeking Behaviour of Rural Women in Badagry, Lagos, Nigeria. *Information Trends*, 4 & 5.

Ukachi, N. B. (2015). Exploration of information literacy skills status and impacts on the quality of life of artisans in Lagos, Nigeria. *New Library World*, 116(9/10), 578-587. Available at http://dx.doi.org/10.1108/NLW-01-2015-0006.

Ukachi, N. B. and Ayiah, E. M. (2017). Exploration of Appropriate Media for Satisfying the Information Needs of Future Community of African Farmers. Library Philosophy and Practice (e-journal), 1513. Available at http://digitalcommons.unl.edu/libphilprac/1513.

Umunakwe, P. C., Nnadi, F. N., Chikaire, J. and Nnadi, C. D. (2014). Information Needs for Climate Change Adaptation among Rural Farmers in Owerri West Local Area of Imo State, Nigeria. *Agrotechnol*, 3, 118. doi:10.4172/2168-9881.1000118.

United Nations (2020). Policy Brief: The Impact of COVID-19 on Food Security and Nutrition. Retrieved on August 11, 2020 from http://www.fao.org/documents/card/en/c/ca8657en

Uzuegbu, P. C. and Naga, M. M. (2016). Information Communication to Rural Cassava Farmers in Nigeria: A Pilot Study. *Journal of Applied Information Science and Technology*, 9(2), 120-132.

Verdier-Chouchane, A. and Karagueuzian, C. (2016). Moving towards a green productive agriculture in Africa: the role of ICTs. *Africa Economic Brief*, 7(7), 1-12.

Weiss, A., Van Crowder, L. and Bernard, M. (2000). Communicating agrometeorological information to farming communities. *Agriculture and Forest Meteorology*, 103, 185-196.

World Bank (2006) World development indicators. Washington, DC: World Bank. Retrieved on June 18, 2020 from http://data.worldbank.org/sites/default/files/wdi06.pdf.

World Farmers' Organisation (2020). COVID-19 Pandemic Outbreak: Overview of the Impact on the Agricultural Sector. A Technical Assessment of the Undergoing Situation. Retrieved on July 27, 2020 from www.wfo-oma.org/covid-19-agri-information-hub.

World Food Programme (2020). Update on the impact of Covid-19 on food and nutrition security in West and Central Africa. WFP Regional Bureau Dakar, Research, Assessments and Monitoring, Emergency Preparedness, Nutrition and Supply Chain Units, April, 17 2020.

World Food Programme (April 21, 2020). COVID-19 will double number of people facing food crises unless swift action is taken. Retrieved on August 19, 2020 from https://www.wfp.org/news/covid-19-will-double-number-people-facing-food-crises-unless-swift-action-taken.

Wulystan, M. P. (2018). The usage of radio and television as agricultural knowledge sources: The case of farmers in Morogoro region of Tanzania. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 14(3), 252-266.

Yaseen, M., Xu, S.W., Yu, W. & Hassan, S. (2016). Farmers' Access to Agricultural Information Sources: Evidence from Rural Pakistan. *Journal of Agricultural Chemistry and Environment*, 5, 12-19.

Yohanna, I., Ndaghu, A. A. & Barnabas, B. P. (2014). Sources of Information on Climate Change among Arable Crop Farmers in Adamawa State, Nigeria. *Journal of Agriculture and Veterinary Science*, 7(8), 32-36. Also available at www.iosrjournals.org.

Zijp, W. (1994). *Improving the transfer and use of agricultural information: A guide to information technology*. Washington, DC: World Bank.