

INFORMATION SOURCING PATTERNS OF RURAL FARMERS FOR AGRICULTURAL PRODUCTION IN NIGERIA'S COVID-19 ERA

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ABSTRACT

The outbreak of COVID-19 has posed a serious challenge to the global community with every country and sector having a fair share of the impact on its economic activities. Agriculture, which is the mainstream of the economy of many countries, including Nigeria, is one of the sectors that are affected by this pandemic. This study therefore, investigated how the outbreak of COVID-19 has impacted on the information sourcing patterns of rural farmers in Nigeria. Survey research design was adopted with the questionnaire used as the research instrument for data collection. Data collected were analysed through descriptive method with multivariate frequency distribution tables and SPSS used as the statistical tools for data analysis. Findings revealed that the outbreak of COVID-19 pandemic did not stop farmers from seeking agricultural information even though their preference for information in areas such as fertilizer application and weed control was higher compared to areas like agriculture loans, pest control and seed selection among others. Rural farmers in Nigeria were more exposed to the informal sources of agricultural information such as family members and fellow farmers compared to the formal and professional sources such as extension workers and the mass media. Among the sources of agricultural information available, the most credible one to rural farmers, however, was not related to the sources most available to them as radio was regarded as the source more credible and trustworthy to them as against family members and fellow farmers which happened to be the sources more available to the rural farmers in this period. Finding also revealed that the demand for information among rural farmers was not significantly related to the level at which such demands were met as sources of the agricultural information available to rural farmers were able to satisfy their information needs but to a little extent. Finding finally revealed that rural farmers faced the major challenge of poor radio/television signals, while lack of ownership of the radio/television set, COVID-19 lockdown protocol, lack of ICT infrastructure and illiteracy were the additional challenges that rural farmers faced in seeking for agricultural information in the era. The conclusion of this study was that the outbreak of COVID-19 does not make agricultural information less important to rural farmers in Nigeria but certain factors limit the sources available from satisfying their agricultural information needs. The study recommended that rural farmers' agricultural information seeking behaviour in areas like agriculture loans, pest control and seed selection among others should be enhanced as it is by doing so that they can acquire adequate knowledge enough to fully develop the sector. Rural farmers should be trained in different areas of agricultural activities to make them more trustworthy by their folks since they are the closest sources to farmers in the rural areas.

Keywords: *Information Sourcing Patterns, Rural Farmers, Agricultural Production, COVID-19 Era*

INTRODUCTION

Information is an important commodity used in the realization of any objective set by an individual or group. Information equips one with the knowledge needed to overcome challenges and take the appropriate step at the right time. A community cannot develop without knowledge, and a community can only become knowledgeable if they recognize and use information as their tool for development (Olaniyi and Ogunkunle, 2018; Bankapur and Bhavanishankar, 2018; Idiake-Ochei, Onemolease & Erie, 2016; Demet, Nilay, Marco & Tunç, 2016; Awili, White & Kimotho, 2016; Kamba 2009; Moore 2007; Sharma and Fatima, 2004). Information is sourced and used for different reasons as some use it for health, occupation and income generation, self-governance, agriculture, education, religion, recreation, current affairs, advancement in knowledge, while others for politics. To all these people, information seeking is a fundamental human process closely related to learning and problem solving. It can be noted that “The decisions concerning which communication channels and information systems will be used, as well as in which way and how they constitute the information seeking behaviour of a user” (Siatiri, 1999, p. 135). Individual tasks for knowledge advancement, creativity and future documentation are factors that constitute the search for information (Awili, White and Kimotho, 2016; Islam and Ahmed, 2012).

Agriculture which is the leading sector of the economy in most developing countries is one of the areas that information is constantly sought and used. In Nigeria, the importance of Agriculture to the economy cannot be over emphasized despite the growth of industries, oil and commerce, it had continued to be the principal economic activity carried out by most Nigerians (Lughlugh, 2020; Stienen, Bruinsma & Neuman, 2017; Mwangi and Kariuki, 2015; Lwoga, 2010) and it is crucial to meet the information needs of farmers for the development of the sector (Demet, Nilay, Marco and Tunç, 2016). The strategic importance of increasing access to knowledge and information is emphasized in the Human Development Report (UNDP, 2001), World Summit for Sustainable Development Plan of Action (UN, 2001) and the Revised World Bank Rural Development Strategy (Odoemelam and Olojede, 2016). To interact with the other factors of production, agricultural information is an essential factor. The farmers decision-making is facilitated towards improved agricultural production, processing, trading and marketing through an effective and efficient release system of essential information and technology services (Anju and Satbir, 2017; Ukachi, 2015; Chen, Liu and Yang, 2011; Rodman, 2006). Success in enhancing agricultural production, providing income and job opportunities and ensuring that the agricultural sub-sector performs its manifest function in furtherance of rural and overall national development, depends largely on the communication system adopted to implement various agricultural programmes (Saleh, Burabe, Mustapha & Nuhu, 2018; Idiake-Ochei, Onemolease & Erie, 2016; Opara, 2008; Adomi, Ogbomo & Inoni, 2003). In fact, there is a positive relationship between the increased flow of knowledge and information and agricultural development (Fawole, 2008 in Anju and Satbir, 2017).

Information needs of rural farmers may range from field acquisition, agricultural inputs (seeds, pesticides, agricultural equipment, weather conditions, harvest technology etc), agricultural technology, agricultural credit (eg. terms of loans), to agricultural marketing, and food technology (Meitei and Devi, 2009 in Demet, Nilay, Marco and Tunç, 2016). Farmers get their information through a number of sources. For instance, in a research conducted in different rural

areas of Philippines, it was found that the most common information source of farmers about new seed varieties was other farmers (Demet, Nilay, Marco and Tunç, 2016; Bello and Obinne, 2012). The most common sources where farmers get related and necessary information that they require are publications (magazines, books etc.), other farmers, family members and friends, community libraries with adequate agricultural sources, visits to organic farms, possible attendance at seminars and regional meetings, and audio-visual sources for farmers with lower literacy level (Padel, 2001 in Demet, Nilay, Marco and Tunç, 2016). Others include: radio, television, trade associations, age groups, extension workers, friends, relatives, posters, handbills, pamphlets and mobile phones (Olajide, 2011; Adio, Abu, Yusufu & Nansoh, 2016; Bello and Obinne, 2012, Ukachi (2007).

Farmers need to be connected to the communication channels through which appropriate information is flowing (Ukachi and Ayiah, 2017). However, some studies that investigated agricultural information used by farmers still found that the majority of these information sources are grossly underutilized by the farmers (Bello and Obinne, 2012; Ugwoke, 2013). Mashroofa and Senevirathne (2014) in Ukachi and Ayiah (2017) stated that farmers need information to identify the cost, storage, usage, varieties of newly introduced seeds, pesticides, and weather in order to get maximum yields and best production. To be able to satisfy these needs, information must be provided to farmers in a format most appealing and comprehensive to them (Mashroofa and Senevirathne, 2014 in Ukachi and Ayiah, 2017).

The outbreak of a novel disease called CoronaVirus Disease 2019 popularly known as COVID-19 which was discovered in the year 2019 in Wuhan, China has posed a serious challenge to all nations of the world. Every economic activity is affected by the outbreak of this pandemic and the agriculture sector is not an exception. There is already existing evidence on the impact of the COVID-19 on agriculture and food security across the globe, including Nigeria (World Farmers' Organisation, 2020; Sasakawa Africa Association, 2020; Padam et al., 2020; World Food Programme, 2020; Schmidhuber, Pound and Qiao, 2020; Obayori, Nchom and Yusuf, 2020; CGIAR, 2020; Omekwe, Omiekuma and Obayori, 2020). For instance, Padam et al (2020) have examined the COVID-19 and its global impact on food and agriculture and found that the pandemic protocols and provisions interferes with the supply chain of the market with impaired production and distribution, accompanied with lack of labor and supply of inputs. This, according to them, vastly affects the livestock, poultry, fishery as well as dairy production. The planting of spring crops like maize, sunflower, spring wheat, barley, canola and open field vegetable can't be operated amidst pandemic. Omekwe, Omiekuma and Obayori (2020), in their study on the effect of Coronavirus on agriculture and education in Nigeria found that Covid-19 has adverse effects on the agriculture and education sectors of the Nigerian economy. Amongst such effects include insufficient food supply, poor agricultural production and poor labour supply. The Economic Community of West African States (ECOWAS) estimated that COVID-19 pandemic risks food insecurity and nutrition of 50 million people between June and August 2020. The pandemic adds to other threats including climate change and recurrent drought, fall armyworm (FAW) and locust infestations in West Africa (CGIAR (2020). Investigating how the information sourcing patterns of rural farmers is affected due to the COVID-19 pandemic remains crucial, hence, the need for this empirical inquiry.

Statement of the Problem

A lot of studies in different places have shown the relevance information on the production and development of agriculture (Olaniyi and Ogunkunle, 2018; Bankapur and Bhavanishankar, 2018; Idiake-Ochei, Onemolease & Erie, 2016; Demet, Nilay, Marco & Tunç, 2016; Awili, White & Kimotho, 2016; Kamba 2009; Moore 2007; Sharma and Fatima, 2004). Access to the right information among farmers significantly leads to sustainable agricultural development (Lughugh, 2020). There are different sources that farmers therefore, derive their agricultural information from in fulfillment of their different agricultural needs. The outbreak of COVID-19 has posed a serious challenge to different sectors of the economy globally. Agriculture is one sector affected by the outbreak of this pandemic and there are speculations of more dangers ahead if pragmatic steps are not taken towards mitigating the impact. Although, some studies are already available on the impacts of COVID-19 on the agriculture sector (World Farmers' Organisation, 2020; Sasakawa Africa Association, 2020; Padam et al., 2020; World Food Programme, 2020; Schmidhuber, Pound and Qiao, 2020; Obayori, Nchom and Yusuf, 2020; CGIAR, 2020; Omekwe, Omiekuma and Obayori, 2020), there seems to be lack of specific empirical studies on how COVID-19 impacts the information sourcing patterns of rural farmers in Nigeria. It is as a result of this gap that this study seeks to investigate how the information sourcing patterns of rural farmers is affected due to the COVID-19 pandemic in Nigeria.

Objectives of the Study

The overall objective of this study is to examine the patterns of information sourcing among farmers in the era of COVID-19 in Nigeria. Specifically, the objectives of this study include:

- i. To find out the agricultural information needs of rural farmers in the era of COVID-19 in Nigeria.
- ii. To examine the sources of agricultural information available to rural farmers in the COVID-19 era in Nigeria.
- iii. To determine the agricultural information sources most credible for rural farmers in the era of COVID-19 in Nigeria.
- iv. To investigate the extent to which the sources of agricultural information available meet the farmers' information needs in the era of COVID-19 in Nigeria.
- v. To ascertain the challenges (if any) farmers face in sourcing for agricultural information in the COVID-19 era in Nigeria.

Research Questions

- i. What are the specific agricultural information farmers seek in the era of COVID-19 in Nigeria?
- ii. What sources of agricultural information are available to rural farmers in the COVID-19 era in Nigeria?
- iii. Which of the agricultural information sources is most credible for rural farmers in the era of COVID-19 in Nigeria?

- iv. To what extent do the sources of agricultural information available meet the farmers' information needs in the era of COVID-19 in Nigeria?
- v. What challenges (if any) do farmers face in sourcing for agricultural information in the COVID-19 era in Nigeria?

LITERATURE REVIEW

Information is conceived as an important resource that contributes immensely to the development initiative of every nation of the world. Every person needs information for decision making. Ideally, information brings about knowledge, and a knowledgeable community is also an informed community. This signifies that a community can not 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). In fact, Stanley (1990) in Mulauzi and Zulu (2012) posited that information is one of the basic needs after air, water, food, and shelter and for any activity to have a realistic chance of successful execution; it depends largely on the availability and access to accurate and reliable information. It is important therefore, that farmers require the right information 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 to participate fully in agricultural affairs (Moore, 2007; Odi, 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).

A number of studies conducted by different scholars (Lughlugh, 2020; Ifejika, 2016; Olaniyi and Ogunkunle, 2018; Ezeh, 2013; Odoemelam and Olojede, 2016; Baba, 2018; Oyeniyi and Olofinsawe, 2015; Idiake-Ochei, Onemolease and Erie, 2016; Abdu`Rahman, 2018) across the globe have shown that agricultural information needs of farmers are in different ways. For instance, in the study by Lughlugh (2020), the findings were that fertilizer and agrochemicals, pest and diseases control, agricultural finance, improved seedlings, post-harvest technology, control of weeds, modern technology application among others were some of the information needs of farmers for sustainable agricultural development in the study area. The Kinds of information sought with mobile phones according to the study conducted by Ifejika (2016) cut across economic, social and health issues in fish market, social gathering, fish catch/gear, health, weather and security related matters. 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. Ezeh's (2013) study revealed that information on physical farm measurement, how to estimate farm output, new varieties of seeds and seedlings, best planting techniques and use of fertilizer were the major areas extension agents applied ICTs in facilitating agricultural activities.

Similarly, in their study, Odoemelam and Olojede (2016) found that the youth needed information on density/plant, nursery management, site selection and fertilizer application; while FADAMA III information needs of farmers according to the study by Baba (2018) included that adoption of environmental friendly practices, operation and maintenance of infrastructure such as agricultural production assets, fishery equipment, agro-processing equipment and community social assets, operation and maintenance of irrigation facilities, preparation of local development plans following participatory and socially inclusive processes, techniques for participatory planning and conflict management, awareness raising strategy and capacity building for environmental screening, review and reinforcement respectively. The study by Oyeniya and Olofinsawe (2015) showed the information needs of farmers in order of magnitude included pest control, preservation of farm produce, and animal treatment. Idiako-Ochei, Onemolease & Erie's (2016) study showed that the information type largely sought by farmers included animal production technology, while the least sought was agricultural credit and value chain. The information needs of the farmers according to the study conducted by Abdu`Rahman (2018) can be categorised into know-how which included what to plant and inputs such as seed varieties to use; market information such as the demand indicators, prices and logistical information; and the contextual information such as best agricultural practices and weather forecast. Diemer, Atuhaire, Fuhrmann & Inauen (2020), in their study revealed that farmers are most likely receptive to organic pest management information at times when they develop an information need (e.g. when encountering a new pest). While Meyers, Gracey, Irlbeck & Akers (2015) revealed in their study that the strongest motivations for accessing agricultural blogs were to find out what other people think about important issues or events and to find alternatives not covered by traditional news sources.

Some of the studies conducted (Ogunniyi and Ojebuyi, 2020; Lughlugh, 2020; Asa and Uwem, 2017; Odoi, 2017; Adegebo, 2016; Ifejika, 2016; Banya, 2014); Folitse, Osei, Dzandu & Obeng-Koranteng, 2016) have shown the influence of agricultural information on farmers. For instance, a study conducted by Adegebo (2016) revealed that dissemination of agricultural information, adoption of positive attitude and the effective use of knowledge positively influenced small scale farmers' productivity in the Southwestern region of Nigeria. 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. Ifejika (2016), in the study conducted revealed that mobile phones improved information seeking behaviour of fisherfolk with associates in the fishing communities than with outsiders in government establishments. Banya (2014) found that the farmers have a positive perception of the messages they received mostly through communication channels such as personal contacts with agric extension agents (AEAs) and mobile phones. Folitse, Osei, Dzandu & Obeng-Koranteng (2016), in their study found 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. Majority of the farmers indicated that they were satisfied with the programme as it had improved the use of agricultural technologies in the area. It was also found that the programme had impacted positively on the livelihoods of the farmers in the study areas (Folitse, Osei, Dzandu & Obeng-Koranteng, 2016). Mobile phone use as found in the study by Ogunniyi and Ojebuyi

(2020) contribute to increase in farmers' income, reduction in transaction and transportation costs, and increase in farm productivity. Odoi (2017) revealed in the study that farmers used the acquired information despite challenges encountered and that led to improvement in banana yields.

Similarly, other studies (Statrasts, 2004; Riesenbergr 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) indicate a number of sources of agricultural information accessed by farmers and the strengths and weaknesses of some of the sources. Information source refers to the institution or an individual that creates or brings about a message (Statrasts, 2004). The characteristics of a good information source are timeliness, accuracy, relevance, cost-effectiveness, trustworthiness, usability, exhaustiveness and aggregation level (Statrasts, 2004). The selection of an information source depends on a number of factors; including level of income, farm size, age, geographical location, level of education (Riesenbergr 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), mention 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) reported 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-Governmental organisations, libraries of agriculture and posters. Balkrishna and Deshmukh (2017) in their study found that social media was a very useful tool in agricultural marketing.

Similarly, Bozi and Ozcatalbas (2010) and Yohanna, Ndaghu & Barnabas (2014) in their separate studies 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. Ezeh (2013) found that although many ICT facilities exist; radio, television and phones sourced personally from open market were the most readily available ICT facilities owned, accessed, and utilized by most farmers, consequently, the level of access and utilization of these facilities were found to be generally low among the respondents. Ijiekhuamhen and Omosekejimi's (2016) study clearly indicated that the major source of information for the respondents was friends and

family members with 95% of the respondents attesting to that, another 75% of the respondents indicated age groups as their source of agricultural information respectively. Oluwatoyin (2016) found that the mass media and the extension agents were the major sources of Agricultural Information for the farmers. According to Suleiman, Ogakason & Faruk (2018) farmers have access to social media platforms and use them to source agricultural information. Umunakwe, Nnadi, Chikaire and Nnadi (2014) revealed that radio (61.6%), extension agents (35.8%) and newspaper (27.5%) were the major sources of agricultural information on climate change identified by farmers. Ogunsola, Ogunsola, Alarape, Oloba & Osalusi (2019); Olaniyi and Ogunkunle (2018); Ha, Okigbo and Igboaka (2008) and Ekoja (2003) revealed the sources of agricultural and nutritional information explored by farmers as: extension agents, mobile phone, friends and neighbors as well as radio. Pamphily, Harrison and Emily (2017) also found that the majority of the farmers accessed agricultural information through radio (68.3%) followed by traditional sources (47.7%) and mobile phones (34.9%). On information networks, farmer to farmer markets, Churches were the highest source of their information network available to farmers (Odoemelum and Alocha, 2015). Kuria (2014) found that agricultural information is highly required among a majority of farmers in the study area and they sourced for agricultural information from a variety of sources, including the internet, social media and extension services.

Interviewing 175 farmers and 56 traders in Lira Uganda, Kleih, Okoboi and Janowski (2004) study revealed that radio (75%) was the main source of information among commodity traders. Mwakaje, (2010), in Tanzania studying 200 farmers indicated that market information sources are dominated by fellow farmers (88.8%), relatives (56%) and traders (37.5%). The study done by Kari (2007) revealed that rural Nigerians have access to agricultural agents and rural health workers (24%), radio (8%), television (6%), GSM services (2.66%) and newspapers (2%). According to the study, radio and Television are often seen as entertainment media rather than sources of information (Kari, 2007). In southern Africa, remote sensing data and geographical information systems are used to provide information to farmers on agricultural production conditions and food security (Weiss, Van Crowder and Bernard, 2000). According to AgREN (2000), the major sources of information and knowledge for smallholder farmers in Kenya are local means such as family, markets, neighbours and community based organisations. The study done in Zambia by Kalusopa (2005) showed that farmers use non-governmental organisations such as farmers union (63.9%); government extension agents (36.7%); personal experience (46.8%), and local groups (Indigenous Knowledge) (36.7%) as the main sources of information for agricultural development. Ogguniyi and Ojebuyi (2020) found that among all the mobile phone features, the most used feature by farmers is radio at the rate of 75.9%, while the mostly deployed phone service is voice call (83.4%).

Print media and audio-visuals (radio and television) were the major information sources of rural women farmers (Alimi, Olugbenga and Ayoola (2017). Ifejika (2016) revealed regular use of close associates than extension workers as a pattern of information seeking behaviour of farmers. Uzuegbu and Naga (2016) in their study revealed friends and relatives, mobile phones, newspapers, agricultural workshops/seminars/conferences, agricultural extension workers, radio, churches, Internet, farm demonstrations, television (TV), village leadership, education and research institutions, and posters/handbills/billboards were the sources of agricultural

information available to farmers. Saleh, Burabe, Mustapha and Nuhu (2018), however, revealed in their study that the use of print in information dissemination in agriculture could not be suitable for teaching farmers with limited education. Odoemelam and Alocha (2015) on perceived weakness and strength of the information network, the information quality, frequency of use, timeliness of information flow, and link up of information were adequate while reliability of information was not adequate. The results show that intra-community information flow was suitable and accessible to rich farmers while inaccessible and often irrelevant to poor farmers. Based on the study conducted by Wulystan's (2018), the accessibility of radio and television sets, gender based division of labour, language, number of agricultural programmes broadcasted and awareness of the broadcasting time of agricultural programmes were among the factors influencing their usage as sources of agricultural knowledge.

Furthermore, a number of studies (Tologbonse, Fashola & Obadijah, 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), however, revealed the challenges in accessing agricultural information by rural farmers for agricultural production. For instance, Tologbonse, Fashola & Obadijah (2008) found that 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. These included financial problems, inadequacy of facilities/professionals, incomplete or irrelevant information. Adegebo (2016) and Ifejika (2016) in their separate studies 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 widespread 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.

Similarly, Byamugisha, Ikoja-Odongo, Nasinyama & Lwasa (2008), in their study revealed the challenges encountered by farmers in Uganda when searching for agricultural information as lack of cooperation from fellow farmers in sharing agricultural information and language barriers. Ogunniyi and Ojebuyi (2020), Mbagwu, Benson and Onuoha (2018), Thuo's (2018), Mtega and Benard (2013), Owolade and Kayode (2012) and Aina (2004), identified the epileptic electricity supply, limited number of radios and television sets, poor/unreliable information infrastructure, low literacy level of farmers, inadequate number of personnel trained in agricultural information, lack of credit facilities and inadequate information from extension agents as factors affecting farmers in accessing agricultural information. Babu, Glendenning, Asenso-Okyere & Govindarajan (2011) revealed that the major constraints facing farmers in accessing information were poor availability, poor reliability, lack of awareness of information sources among farmers and untimely provision of information. Awili, White and Kimotho's (2016) results of the study rather showed a negative and significant relationship between

language barrier, farmers' attitude and effective communication of agricultural information. Abdul-Aziz and Baba's (2017) findings revealed that farmers lack awareness for using the Internet as an alternative means of getting Agricultural Information easily even with the shortage of extension agents. The study further identifies the farmer's constraints in using the internet for information to low awareness, low access and lack skills. Oladimeji's (2006) study revealed that the diversity of the languages in Nigeria presupposes that for farmers to have access to agricultural information through the radio and television, the language of presentation has to be based on that of the listeners.

Theoretical Framework

This study is anchored on the Uses and Gratifications Theory. Uses and Gratification Theory" or "need seeking" is one of the theories of communications that focuses on social communications. This theory adapts a functionalist approach to communications and media, and where study on information sourcing patterns of the people such as this is to be carried out, this theory is relevant because it pointed that media's most important role is to fulfill the needs and motivations of the audience. Therefore, the more these needs are met, the more satisfaction is yielded (Windahl, Signitzer and Olson, 2008 in Mehrad and Tajer, 2016). Audience's overall motive of seeking for information is to satisfy their already predisposed needs of seeking for such information. This theory initially therefore focuses on the motifs of the audience (Ruggiero, 2000 in Mehrad and Tajer, 2016) and then analyzes the message and social system (Sarkisian, Nikoo, Saeedian, 1997 in Mehrad and Tajer, 2016). In other words, this theory concentrates on how users like farmers seek media and to what extent they are satisfied with its type, content, and method of use (Amiri, Noori and Basatian, 2012 in Mehrad, and Tajer, 2016).

RESEARCH METHODOLOGY

Survey research design was adopted in this study and the questionnaire was used as the research instrument for data collection. 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 rural farmers across the six geo-political zones of Nigeria. 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- 867846, (ii) Enugu- 516820, (iii) Edo- 419106, (iv) Kano- 4013611, (v) Bauchi- 1032907, and (vi) 694422 (National Bureau of Statistics, 2012). Therefore, the population of the study comprised 7,544,712 farmers in Nigeria. The sample size of the study was 1111 which was determined using a published sample size determination table which shows that if the population size of the study is greater than 100,000, the sample size of that study under the confidence level of 95% and 3% error margin should be 1111 (Taro Yamane, 1967 in Kusugh, 2017). 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 which farmers were most affected by the COVID-19 pandemic as at the time of the study and an agrarian state, except where state most affected in the zone was not an agrarian or metropolitan in nature or a conflict prone state. Based on this, the states sampled in the study were (i) Oyo (South West), (ii) Enugu (South East), (iii) Edo (South South), (iv) Kano (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

$$\text{Oyo} \quad \frac{867846}{7544712} \times \frac{1111}{1} = 128$$

$$\text{Enugu} \quad \frac{516820}{7544712} \times \frac{1111}{1} = 76$$

$$\text{Edo} \quad \frac{419106}{7544712} \times \frac{1111}{1} = 62$$

$$\text{Kano} \quad \frac{4013611}{7544712} \times \frac{1111}{1} = 591$$

$$\text{Bauchi} \quad \frac{1032907}{7544712} \times \frac{1111}{1} = 152$$

$$\text{Plateau} \quad \frac{694422}{7544712} \times \frac{1111}{1} = 102$$

Based on the proportionate sampling technique used, 128 respondents were sampled in Oyo, 76 in Enugu, 62 in Edo, 592 in Kano, 152 in Bauchi, and 102 respondents in Plateau respectively. The research instrument used in the study was the questionnaire. The questionnaire was administered on the respondents through face-to-face using the research assistants in the area which were taught 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.

DATA ANALYSIS

A total of 1060 copies of the questionnaire, representing (95%) out of the 1111 copies administered on the respondents returned in good shape for analysis while, 51 copies representing (5%) suffered mortality because some of them 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 Oyo, 123 (96%) returned while 5 (4%) out of the 128 copies of the questionnaire administered on the respondents suffered mortality; in Enugu, 72 (95%) copies were returned for analysis while 4 (5%) out of the 76 copies suffered mortality; in Edo, 59 (95%) copies were returned while 3 (5%) suffered mortality; in Kano, 564 (95%) copies returned while 27 (5%) suffered mortality; in Bauchi, 145 (95%) copies returned while 7 (5%) suffered mortality; while in Plateau State, 97 (95%) copies

returned while 5 (5%) suffered mortality. Therefore, the 1060 representing 95% returned out of the 1111 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 51 representing 5% is highly insignificant to affect the data for this study. The analysis of this study is therefore based on the 95 percent of the questionnaire returned in the study.

Research Question 1: What are the specific agricultural information farmers seek in the era of COVID-19 in Nigeria?

Table One: Farmers' Agricultural Information Needs in the era of COVID-19 in Nigeria

Variable	No. of Respondents												Total	
	Oyo		Enugu		Edo		Kano		Bauchi		Plateau			
Fertilizer application	41	33.3	20	27.8	19	32.2	241	42.7	44	30.3	29	29.9	394	37.2
Agriculture loans	7	5.7	6	8.3	5	8.5	39	6.9	9	6.2	8	8.2	74	7.0
Weed control	19	15.4	11	15.3	8	13.6	129	22.9	21	14.5	18	18.6	206	19.4
Pest control	13	10.6	7	9.7	4	6.8	21	3.7	14	9.7	11	11.3	70	6.6
Seed selection	6	4.9	4	5.6	3	5.1	29	5.1	9	6.2	7	7.2	58	5.5
Agric marketing	9	7.3	5	6.9	3	5.1	21	3.7	11	7.6	6	6.2	55	5.2
Crop rotation practices	3	2.4	1	1.4	1	1.7	13	2.3	5	3.4	2	2.1	25	2.4
Land preparation	2	1.6	3	4.2	2	3.4	9	1.6	3	2.1	2	2.1	21	2.0
Farm labourers	1	0.8	3	4.2	1	1.7	7	1.2	2	1.4	1	1.0	15	1.4
Disease control and treatment	3	2.4	2	2.8	2	3.4	11	2.0	4	2.8	2	2.1	24	2.3
Storage methods	8	6.5	4	5.6	2	3.4	12	2.1	9	6.2	5	5.2	40	3.8
Farm irrigation	2	1.6	1	1.4	3	5.1	17	3.0	3	2.1	1	1.0	27	2.5
Planting methods	5	4.1	2	2.8	3	5.1	8	1.4	6	4.1	3	3.1	27	2.5
Farm mechanization	4	3.3	3	4.2	3	5.1	7	1.2	5	3.4	2	2.1	24	2.3
Total	123	100	72	100	59	100	564	100	145	100	97	100	1060	100

Source: Field Survey, 2020.

Table one is concerned with the farmers' needs in the era of COVID-19 in Nigeria. Data revealed that 37.2% out of the total number of the respondents sampled in the study said information on fertilizer application was sought by them with Kano having the 42.7% response rate of the information seekers on fertilizer application, 7.0% out of the respondents sought information on agriculture loans, 19.4% out of the respondents sought on weed control, 6.6% out of the respondents sampled sought in pest control, 5.5% of them sought information on seed selection, 5.2% of the respondents sought on agric marketing, 2.4% out of the respondents sought on crop rotation practices, 2.0% sought on land preparation, 1.4% sought to get information on farm labourers, 2.3% out of the respondents needed information on disease control and treatment, 3.8% out of the respondents sought to get information on storage methods,

2.5% out of the respondents were on farm irrigation, another 2.5% were on planting methods, and 2.3% of the respondents sought to get information on farm mechanization.

Table one answered the research question one to the effect that despite the outbreak of COVID-19, the desire among rural farmers in Nigeria to get agricultural information still remains high, particularly in the area of fertilizer application and weed control, while the desire for information in other areas like agriculture loans, pest control, seed selection, agric marketing, crop rotation practices, land preparation, farm labourers, disease control and treatment, storage methods, farm irrigation, planting methods, and farm mechanization were lower compared to the information on fertilizer application and weed control.

Research Question 2: What sources of agricultural information are available to rural farmers in the COVID-19 era in Nigeria?

Table Two: Sources of Agricultural Information available to Rural Farmers in the COVID-19 era in Nigeria

Variable	No. of Respondents												Total	
	Oyo		Enugu		Edo		Kano		Bauchi		Plateau			
Radio	17	13.8	10	13.9	9	15.3	98	17.4	19	13.1	17	17.5	170	16.0
Television	7	5.7	3	4.2	3	5.1	15	2.7	9	6.2	4	4.1	41	3.9
Newspaper	5	4.1	2	2.8	1	1.7	8	1.4	4	2.8	2	2.1	22	2.1
Magazine	2	1.6	1	1.4	1	1.7	4	0.7	2	1.4	1	1.0	11	1.0
Mobile phones	15	12.2	8	11.1	7	11.9	59	10.5	17	11.7	11	11.3	117	11.0
Social media platforms	13	10.6	7	9.7	4	6.8	37	6.6	11	7.6	7	7.2	79	7.5
Posters	1	0.8	1	1.4	1	1.7	5	0.9	2	1.4	1	1.0	11	1.0
Agriculture Extension Officers	3	2.4	2	2.8	1	1.7	7	1.2	4	2.8	2	2.1	19	1.8
Family members	32	26.0	21	29.2	17	28.8	194	34.4	41	28.3	27	27.8	332	31.3
Fellow farmers	21	17.1	13	18.1	11	18.6	111	19.7	23	15.9	19	19.6	198	18.7
Village leaders	3	2.4	2	2.8	2	3.4	11	2.0	5	3.4	2	2.1	25	2.4
Farmers' clubs/Associations	2	1.6	1	1.4	1	1.7	5	0.9	2	1.4	1	1.0	12	1.1
Churches/Mosques	2	1.6	1	1.4	1	1.7	10	1.8	6	4.1	3	3.1	23	2.2
Total	123	100	72	100	59	100	564	100	145	100	97	100	1060	100

Source: Field Survey, 2020.

Table two is concerned with the sources of agricultural information available to rural farmers in the COVID-19 era in Nigeria. Data revealed that 16.0% out of the total number of the respondents sampled in the study were of the opinion that they have access to the radio as their source of agricultural information in the COVID-19 era, 3.9% out of the respondents choose television as the source of agriculture information available to them, 2.1% out of the respondents

choose newspaper, 1.0% had access to magazine as source of agricultural information, 11.0% of the respondents said it was mobile phones, 7.5% of the respondents choose social media platforms as the source of agricultural information available to them, 1.0% had access to posters, 1.8% respondents choose agriculture extension officers as the source of agricultural information available to them, 31.3% of the respondents, with Kano having the highest response rate, said family members were their main source of agricultural information in the COVID-19 era, 18.7% of the respondents said it was fellow farmers, 2.4% of the respondents said it was village leaders, 1.1% of the respondents said it was farmers' club/associations, while 2.2% of the respondents mentioned Churches/Mosques as sources of information available to them.

Research question two is therefore answered using table two to the effect that family members were the source of agricultural information most available to rural farmers in Nigeria in the COVID-19 era followed by fellow farmers, with the radio and social media coming third and fourth as sources of agricultural information among rural farmers respectively; while television, newspaper, magazine, social media platforms, posters, agriculture extension officers, village leaders, farmers' clubs/associations and Churches/Mosques are behind as the least sources available to farmers in the era.

Research Question 3: Which of the agricultural information sources is most credible for rural farmers in the era of COVID-19 in Nigeria?

Table Three: Agricultural Information Source most Credible for Rural Farmers in the Era of COVID-19 in Nigeria

Variable	No. of Respondents												Total	
	Oyo		Enugu		Edo		Kano		Bauchi		Plateau			
Radio	31	25.2	21	29.2	19	32.2	135	23.9	39	26.9	29	29.9	274	25.8
Television	15	12.2	7	9.7	9	15.3	45	8.0	15	10.3	14	14.4	105	9.9
Newspaper	3	2.4	2	2.8	1	1.7	17	3.0	4	2.8	3	3.1	30	2.8
Magazine	2	1.6	1	1.4	1	1.7	9	1.6	2	1.4	2	2.1	17	1.6
Mobile phones	9	7.3	5	6.9	3	5.1	25	4.4	11	7.6	6	6.2	59	5.6
Social media platforms	6	4.9	4	5.6	2	3.4	19	3.4	9	6.2	3	3.1	43	4.1
Posters	3	2.4	1	1.4	1	1.7	7	1.2	1	0.7	1	1.0	14	1.3
Agriculture Extension Officers	12	9.8	9	12.5	7	11.9	84	14.9	14	9.7	12	12.4	138	13.0
Family members	9	7.3	6	8.3	5	8.5	59	10.5	11	7.6	7	7.2	97	9.2
Fellow farmers	8	6.5	4	5.6	2	3.4	31	5.5	10	6.9	3	3.1	58	5.5
Village leaders	8	6.5	4	5.6	3	5.1	51	9.0	9	6.2	4	4.1	79	7.5
Farmers' clubs/Associations	7	5.7	3	4.2	2	3.4	21	3.7	5	3.4	3	3.1	41	3.9
Churches/Mosques	10	8.1	5	6.9	4	6.8	61	10.8	15	10.3	10	10.3	105	9.9
Total	123	100	72	100	59	100	564	100	145	100	97	100	1060	100

Source: Field Survey, 2020.

Table three is concerned with the source of agricultural information most credible to the respondents in the era of COVID-19 in Nigeria. Data revealed that radio was more credible than other sources to 25.8% out of the total respondents sampled in the study; television was more credible than other sources to 9.9% of the respondents; newspaper was credible more than other sources to 2.8% of the respondents, magazine was more credible than other sources to 1.6% of the respondents; mobile phones was 5.6% credible to the respondents more than other sources, social media platforms were 4.1% credible to the respondents than other sources; poster was 1.3% credible to the respondents more than other sources; agriculture extension workers was 13.0% credible to the respondents more than other sources; family members were the sources of agricultural information which were 9.2% more credible to the respondents than other sources; fellow farmers were the sources of agricultural information which was 5.5% more credible to the respondents than other sources; village leaders were 7.5% more credible to the respondents than other sources, farmers' club/associations were 3.9% more credible to the respondents than other sources; while Churches/Mosques were sources 9.9% more credible to the respondents than other sources.

Research question three is answered using table three to the effect that among sources of agricultural information available to the rural farmers in the COVID-19 era, radio is regarded as the source more credible and trustworthy to them than other sources.

Research Question 4: To what extent do the sources of agricultural information available meet the farmers' information needs in the era of COVID-19 in Nigeria?

Table 4: Extent the Sources of Agricultural Information available meet the farmers' Information Needs in the era of COVID-19 in Nigeria

Variable	No. of Respondents												Total	
	Oyo	Enugu	Edo	Kano	Bauchi	Plateau								
To a great extent	29	23.6	17	23.6	9	15.3	83	14.7	31	21.4	23	23.7	192	18.1
To a little extent	91	74.0	53	73.6	49	83.1	472	83.7	110	75.9	72	74.2	847	79.9
Difficult to say	3	2.4	2	2.8	1	1.7	9	1.6	4	2.8	2	2.1	21	2.0
Total	123	100	72	100	59	100	564	100	145	100	97	100	1060	100

Source: Field Survey, 2020.

Table four is concerned with the extent to which sources of the agricultural information available to the respondents were able to satisfy the information needs of the respondents in the COVID-19 era. Data available revealed that 18.1% out of the total number of the respondents sampled in the study were satisfied to a large extent with the level to which the sources of the agricultural information meet their information needs; 79.9% out of the respondents were satisfied to a little extent with the level to which the sources of the information available to them satisfied their

agricultural information needs with Kano and Edo having the highest response rate; while 2.0% out the respondents sampled in the study found it difficult to say.

Table four therefore, answered the research question four to the effect that that the sources of the agricultural information available to the respondents in the COVID-19 era are able to satisfy the rural farmers' information needs but not to a great extent.

Research Question 5: What challenges (if any) do farmers face in sourcing for agricultural information in the COVID-19 era in Nigeria?

Table 5: Challenges of Farmers in Sourcing Agricultural Information in the COVID-19 era in Nigeria

Variable	No. of Respondents												Total	
	Oyo		Enugu		Edo		Kano		Bauchi		Plateau			
Poor radio and television signals	63	51.2	41	56.9	36	61.0	345	61.2	76	52.4	50	51.5	611	57.6
COVID-19 Lockdown protocol	15	12.2	7	9.7	6	10.2	67	11.9	17	11.7	13	13.4	125	11.8
Lack of ICT infrastructure	11	8.9	4	5.6	3	5.1	31	5.5	13	9.0	9	9.3	71	6.7
Illiteracy	13	10.6	5	6.9	5	8.5	42	7.4	16	11.0	11	11.3	92	8.7
Lack of ownership to radio/television set	21	17.1	15	20.8	9	15.3	79	14.0	23	15.9	14	14.4	161	15.2
Total	123	100	72	100	59	100	564	100	145	100	97	100	1060	100

Source: Field Survey, 2020.

Table five is concerned with the challenges that the respondents face in sourcing for agricultural information in the COVID-19 era in Nigeria. Data revealed that 57.6% of the respondents faced the challenge of poor radio and television signals in sourcing for agricultural information in the COVID-19 era in Nigeria, with Kano and Edo having the highest response rate of those who responded to that, 11.8% of the respondents faced the COVID-19 lockdown protocol as their challenge in sourcing for agricultural information in the era; 6.7% of the respondents faced the challenge of lack of ICT infrastructure in sourcing for agricultural information in the era; 8.7% out of the respondents sampled in the study faced the challenge of illiteracy; while 15.2% of the respondents faced challenge of lack of ownership of radio/television set in sourcing for agricultural information in the era.

Table five answered the research question five to the effect that the major challenge that rural farmers in Nigeria face in sourcing for agricultural information in the era of COVID-19 is poor

radio and television signals in their area, with lack of ownership of the radio/television set, COVID-19 lockdown protocol, lack of ICT infrastructure and illiteracy being additional challenges that rural farmers face in the era.

Discussion of Findings

Based on the data analysed, the following are the specific findings of the study:

Despite the outbreak of COVID-19, the desire among rural farmers in Nigeria to get agricultural information remains high, particularly in the area of fertilizer application and weed control, while the desire for information in other areas like agriculture loans, pest control, seed selection, agric marketing, crop rotation practices, land preparation, farm labourers, disease control and treatment, storage methods, farm irrigation, planting methods, and farm mechanization were lower compared to the information on fertilizer application and weed control. This implies that the outbreak of the COVID-19 pandemic does not stop farmers in Nigeria from seeking agricultural information even though the preference for information on fertilizer application seems to be higher than other areas of information needs. This finding agrees with the previous scholars which indicated that farmers' information needs are in different forms (Lughlugh, 2020; Ifejika, 2016; Olaniyi and Ogunkunle, 2018; Ezeh, 2013; Odoemelam and Olojede, 2016; Baba, 2018; Oyeniyi and Olofinsawe, 2015; Idiake-Ochei, Onemolease and Erie, 2016; Abdu`Rahman, 2018). Lughlugh (2020), for instance, found in the study that fertilizer and agrochemicals, pest and diseases control, agricultural finance, improved seedlings, 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. Abdu`Rahman (2018) categorized the farmers' information needs into know-how which included what to plant and inputs such as seed varieties to use; market information such as the demand indicators, prices and logistical information; and the contextual information such as best agricultural practices and weather forecast.

Finding also revealed that family members were the source of agricultural information most available to rural farmers in Nigeria in the COVID-19 era followed by fellow farmers, with the radio and social media coming third and fourth as sources of agricultural information among rural farmers respectively; while television, newspaper, magazine, social media platforms, posters, agriculture extension offers, village leaders, farmers' clubs/associations and Churches/Mosques are behind as the least sources available to farmers in the era. This implies that with the outbreak of the COVID-19, rural farmers in Nigeria are more exposed to the informal sources of agricultural information than the formal and professional sources. This finding opposed the finding from the study by Pamphily, Harrison and Emily (2017) which indicated that the majority of the farmers accessed agricultural information through radio (68.3%) followed by traditional sources (47.7%). Others studies are those of Ogunsola, Ogunsola, Alarape, Oloba & Osalusi (2019), Olaniyi and Ogunkunle (2018), Oluwatoyin (2016) Umunakwe, Nnadi, Chikaire and Nnadi (2014), which found that the mass media and the extension agents (Nnadi, Chikaire and Nnadi, 2014); extension agents (Olaniyi and Ogunkunle, 2018); the radio (61.6%), extension agents (35.8%) and newspaper (27.5%) (Umunakwe, Nnadi, Chikaire and Nnadi, 2014); television (91.9%), Radio (89.9%) (Ogunsola, Ogunsola, Alarape, Oloba & Osalusi, 2019) were the major sources of agricultural information for the farmers. Although some studies still aligned with this finding that the "major source of information for

farmers was friends and family members with 95% of the respondents attesting to that, another 75% of the respondents indicated age groups as their source of agricultural information respectively” (Ijiekhuamhen and Omosekejimi, 2016). Bozi and Ozcatalbas (2010) revealed that family members, neighbour farmers ... were key sources of information for Turkish farmers, while AgREN (2000) found that the major sources of information and knowledge for smallholder farmers in Kenya were local means such as family, markets, neighbours and community based organisations.

Another finding of the study revealed that among sources of agricultural information available to the rural farmers in the COVID-19 era in Nigeria, radio is regarded as the source more credible and trustworthy to them than other sources. This implies that the source most credible to the respondents is not related to the source most available to farmers for agricultural information in the COVID-19 era. Odoemelam and Alocha (2015), in their study found that on perceived weakness and strength of the information network, the information quality, frequency of use, timeliness of information flow, and link up of information were adequate while reliability of information was not adequate.

Finding revealed that the sources of the agricultural information available to the respondents in the COVID-19 era are able to satisfy the rural farmers’ information needs but not to a great extent. This implies that the demands for information among rural farmers in the era of COVID-19 in Nigeria is not significantly related to the level at which such demands are met. 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.

Furthermore, finding revealed that the major challenge that rural farmers in Nigeria face in sourcing for agricultural information in this era of COVID-19 is poor radio and television signals in their area, with lack of ownership of the radio/television set, COVID-19 lockdown protocol, lack of ICT infrastructure and illiteracy being additional challenges that rural farmers face in the era. This implies that farmers face different challenges in sourcing for their agricultural information like poor radio and television signals and others. different studies revealed the challenges farmers face in accessing agricultural information (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) found that 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.

CONCLUSION

In Nigeria, the outbreak of COVID-19 pandemic does not stop farmers from seeking agricultural information even though the preference for information in areas like fertilizer application and weed control is higher compared to areas such as agriculture loans, pest control, seed selection, agric marketing, crop rotation practices, land preparation, farm labourers, disease control and treatment, storage methods, farm irrigation, planting methods, and farm mechanization. In

seeking agricultural information in the COVID-19 era, rural farmers in Nigeria are more exposed to the informal sources of agricultural information such as family members and fellow farmers than the formal and professional sources like the extension workers and the mass media. Among the sources of agricultural information available, the most credible one to rural farmers in Nigeria is not related to the source most available to them in the COVID-19 era, as radio is regarded as the source more credible and trustworthy to them as against family members and fellow farmers however, family members and fellow farmers happen to be sources more available to the rural farmers in this period. The demand for information among rural farmers in Nigeria is not commensurate with the level at which such demands are met as sources of the agricultural information available to rural farmers in the era are able to satisfy the information needs of rural farmers but to a little extent. Rural farmers, in their quest for agricultural information face the major challenge of poor radio and television signals, while lack of ownership of the radio/television set, COVID-19 lockdown protocol, lack of ICT infrastructure and illiteracy are the additional challenges that rural farmers face in seeking agricultural information in the era. Finally, the outbreak of COVID-19 does not make agricultural information less important to rural farmers in Nigeria but certain factors limit the sources available from satisfying the farmers' agricultural information needs.

RECOMMENDATIONS

Based on the findings and conclusion, the following are the specific recommendations of the study:

- i. Rural farmers' agricultural information seeking behaviour in areas like agriculture loans, pest control, seed selection, agric marketing, crop rotation practices, land preparation, farm labourers, disease control and treatment, storage methods, farm irrigation, planting methods, and farm mechanization in this era of COVID-19 should be enhanced as it is by so doing that they can acquire adequate knowledge that can help to fully develop the sector.
- ii. Rural farmers should be trained in different areas of agricultural production since they also constitute a vital source of agricultural information so that they are more trusted by their fellow farmers.
- iii. There is an urgent need to boost the signals of the various community, private, state and federal radio signals in Nigeria to enable the rural farmers have more access to agricultural information through the radio, since it is their more trusted source of agricultural information in the country.
- iv. All hands must be on deck to ensure that farmers' information needs are satisfied to a great extent. That is, the government, development agencies, private groups and individuals must work towards addressing the challenges facing farmers in sourcing agricultural information for more effective agricultural development in the rural areas of Nigeria.

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