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EXAMINING THE RELATIONSHIP BETWEEN INFORMATION LITERACY AND AGRICULTURAL PRODUCTIVITY AMONG RICE FARMERS IN KURA, KANO STATE, NIGERIA: A MULTI-DIMENSIONAL ANALYSIS

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Abstract
The ability of farmers to critically determine the extent of information need, access available information effectively and evaluate the information to accomplish a specific farming purpose is known as agricultural information literacy. Agricultural information literacy of farmers is of paramount importance for the growth and development of the agricultural sector. However, despite the richness of Nigeria in variety of subsistence crops such as maize, corn, beans and sorghum, there have substantially been declined in productivity in recent years leading to frequent famine. This study therefore sought to assess the relationship between farmer information literacy and agricultural productivity among rice farmers in Kura, Kano State, Nigeria -West Africa. The study adopted a descriptive research design and targeted 2,836 households within Kura local government with a sample size of 284 heads of farmers' household. The sample size determination was based on Krejcie and Morgan Sample Size determination table for ±5% precision and 95% confidence levels. The study utilized a structured questionnaire for data collection. The questionnaire was pilot tested to ensure it measures the expected objectives. Data on farmers' demographic profile were analysed descriptively using frequencies and percentages then translated on tables and graphs. While the study objective was analysed quantitatively based on the study design. The study findings revealed that information awareness had significant association with agricultural productivity at 0.05 (1-tailed) (r = 0.278, p<1560), while Information Access depicted a weak significant relationship with Agricultural Productivity at 0.01 (2-tailed) (r =.175, p>1560). The study concludes that rice farmers who lack information literacy are more likely to rely on traditional farming practices that may not be as productive or efficient as the literate. They may also struggle to access and use vital agricultural information, limiting their ability to improve their farming practices and increase their productivity. The study thus recommends that rice farmers in Kura, Kano State should be trained and educated on the various sources of agricultural information available to them.

Keywords: *Information Literacy, Rice Farmers, Farming Practices, Agricultural Productivity, Kura, Kano State*

Introduction

Information literacy is the ability to identify information needs, seek out resources to meet those needs, analyse, evaluate, synthesize, and use the resulting knowledge. Farmer, information literacy is a set of abilities that allow a farmer to recognize when information is needed and effectively act on that need (Okediji, Moruf & Bello, 2020). It is beyond access and utilization of computers, internet, and its related technologies rather it includes the ability and readiness to understand the magnitudes of significance and

value of information, locate, evaluate, select appropriate information sources and translate into knowledge for strategic and productive utilization (Okediji, Moruf & Bello, 2020). The ability of farmers to critically determine the extent of information need, access available information effectively and evaluate the information to accomplish a specific farming purpose is known as agricultural information literacy (Eamin & Roknuzzaman, 2017). Agricultural information literacy played significant roles to researchers, stakeholders in the agricultural sector such as agricultural extension workers and farmers at different stages of farming; land preparation, pest control, harvesting, food storage, credit facilities and marketing (Kiplang'at, 2019). Osokoya, Alabi and Fagbola (2014) added that informed farmers are known for their competence in terms of identification of information need, sources, access and utilization of agricultural information to solve agricultural problems geared towards enhancing agricultural productivity.

Information sources are tools or carriers that provide required information to an individual. Farmers obtained agricultural information from several sources of information such as print and non-print bibliographic sources; books, encyclopaedias, magazines, electronic databases (AGRIS, AGORA), newspapers, library catalogues, broadcast media such as television and radio. Others are new age media such as social media platforms which include WhatsApp, Facebook, Twitter, and Instagram among others (Mugwisi, Ocholla & Mostert, 2016). Ajuwon and Odeku (2018) stressed that agricultural information sources contribute significantly to agricultural production as farmers can adopt new technologies or farming systems, identify when to plant and harvest, crop to produce and where to sell. It is also through agricultural information that farmers can acquire bank facilities, seedlings as well as pests and diseases control measure which consequently is capable of improving agricultural productivity and improve farmers' standard of living.

Broadcasting media, including television and radio, and extension services also play a crucial role in disseminating agricultural information to farmers, as demonstrated by Mekonnen et al. (2020). These sources can deliver information in a more accessible and understandable manner, were highly effective in reaching farmers, particularly in remote areas (Tegene, Wims, Gebeyehu & Melkato, 2022). Similarly, exhibitions and agricultural shows provide opportunities for farmers to learn about new farming technologies and practices, and to network with other farmers and agricultural professionals. Information and communication technology (ICT), such as mobile phones and the internet, has also emerged as a key source of agricultural information, enabling farmers to access real-time market information, weather forecasts, and expert advice. Despite its potential, however, the use of ICT may be hindered by factors such as poor network coverage and low digital literacy among farmers (Tegene et al., 2022).

Extension services continue to be a widely used source of information for farmers and farmers who have contact with agricultural extension services have better knowledge and adoption of improved agricultural practices (Adhikari et al., 2020). The utilization of extension services by farmers varies widely across different regions and countries, influenced by a range of factors such as institutional support, availability of services, and the farmers' awareness and understanding of these services (WFP, 2020). In many developing countries, where a large portion of the population is engaged in farming, extension services have traditionally played a crucial role in supporting farmers. Moreover, exhibitions and agricultural shows provide valuable information, but their utilization is limited by factors such as distance and cost. On the other hand, the use of Information and Communication Technology (ICT), particularly mobile phones, has been increasing among farmers. According to a study by Mekonnen et al. (2021), farmers are increasingly using mobile phones to access agricultural information, including market prices, weather forecasts, and expert advice. However, factors such as network coverage and digital literacy can influence the extent to which farmers can effectively use these technologies.

Agricultural information is essential to effective farming activities and related decisions, however, farmers need to find the best sources of agriculture information. Yet, finding the credible information and sources is not always easy (Mohammed, 2008). Despite numerous sources of information, rice farmers still find it challenging to identify convenient information sources due to time and cost effectiveness. Often, Farmers

are left with limited options for agricultural information and this increases the chances of falling prey to non-credible sources of information (Adio, Abu, Yusuf & Nansoh, 2016). According to the 2017 world survey on information sources, newspapers are the most popular source that provide latest agricultural information. This is followed by agricultural departments, television, agricultural research institutions and radio respectively. The Newspaper's strength lies in their low cost implication which makes it easier for many people to obtain it.

The International System for Agricultural Science and Technology (AGRIS) is a universal public domain database exceeding 12 million structured bibliographical records on agricultural science and technology. It has numerous reference materials such as dissertations, research papers, and conferences proceedings which helps agricultural stakeholders to improve access and exchange of related agricultural research information. Also, Access to Global Online Research (AGORA) is a programme established by the Food and Agriculture Organization (FAO) under the United Nations in collaborations with key publishers to enable farmers in developing countries gain access to outstanding digital library collections in area of food, agriculture, environmental science and related social sciences. It has approximately 15,500 major journals and 48,000 books in more than 115 countries. It also sponsors thousands of students, faculty members and researchers from developing countries to undertake agricultural research.
Broadcasting sources, such as radio and television, remain crucial channels for disseminating agricultural information to farmers, particularly in rural areas with limited access to digital technologies. Radio programs, like those supported by the Farm Radio International (FRI, 2020), deliver practical knowledge on a wide range of topics, including crop and livestock management, weather forecasts, and market information. Radio's affordability, accessibility, and ability to overcome literacy barriers make it an effective tool for reaching large audiences (Asenso-Okyere & Mekonnen, 2019). Similarly, television programs, like Shamba Shape Up (Mediae, 2020), provide farmers with visually engaging content, enabling them to learn through observation and demonstrations. These broadcasting sources are particularly advantageous in areas with limited internet connectivity, ensuring that vital agricultural information is accessible to a diverse range of farmers (Torero, 2020).

Agricultural information system according to Roling, (2018) is a system, which generate, transform, transfer, consolidate, receive and fed back agricultural information in a manner promote knowledge utilization by agricultural producers. Agricultural information system consists of components, information related processes, system mechanisms and system operations which indicates that systems operate as facilitators and communicators by way of assisting farmers in decision making and ensure the implementation of appropriate knowledge for sustainable agricultural and rural development (FAO, 2018). Subsistence farming is characterized by low productivity, risk, and uncertainty as it focuses on crop and livestock rearing mainly for personal and household consumption (Todaro, 2017) though farmers sell less than 50% of the agricultural products since the scale of production is generally small and associated with low degree of market participation and a high production for own consumption (Bruntrup & Heidhues, 2018). In addition, Bruntrup and Heidhues (2018) further observe that increased subsistence farming has the potential to improve food security of poor households in rural and urban areas by way of reducing dependence on food purchase amidst inflation.

In Pakistan, rice is a significant crop, cultivated on an estimated 2.9 million hectares of land, with around 600,000 farmers engaged in its production (Pakistan Bureau of Statistics, 2020). These rice farmers predominantly rely on multiple sources for agricultural information, including traditional sources like extension agents, input dealers, and fellow farmers (Ali et al., 2019). With the growing penetration of mobile phones and digital technology in rural areas, many farmers are now accessing information through digital platforms and mobile applications, such as the Pakistan Agricultural Research Council's (PARC) mobile app

(PARC, 2020). These digital platforms provide valuable information on crop management, pest control, weather forecasts, and market prices, enabling farmers to make more informed decisions and improve their productivity. In Europe, countries such as France, Portugal, Poland, Hungary, Spain, Romania, Bulgaria and Italy thrive on subsistence farming as large tracts of land are under subsistence and semi-subsistence farming (Doer, 2009). These countries are among the largest producers of several staple foods such as wheat, corn, pats, sorghum, and potatoes due to improved technology, increased access to information and utilization of agricultural information. However, some crop yields have been declining due to a dearth of information on pests, diseases and climate change (Poisvert, Curie, & Moatar, 2017).

On the continent of Africa, the agricultural sector in Africa is the backbone of many countries economy as majority of the population survives on subsistence farming. With regards to farmer information literacy, the continent lags behind in spite of the general improved information literacy levels and information systems. Most African countries are yet to devote their efforts to disseminating agricultural information and knowledge on agriculture to rural areas, where 70 to 80 percent of the African populace lives. Lack of access to agricultural information and knowledge transfer can hamper agricultural production in rural farming communities in Africa (Krell et al., 2020). In Kenya, rice is a critical food crop, cultivated on approximately 34,000 hectares, involving around 80,000 smallholder farmers (Kipkoech et al., 2019). These farmers obtain agricultural information from various sources, such as agricultural extension officers, research institutions, non-governmental organizations, and input suppliers (Kiptot et al., 2019). Additionally, due to the increasing penetration of digital technology in rural Kenya, farmers are accessing information through digital platforms, including mobile applications, websites, and social media, which provide timely and accurate information on crop management, pest control, weather forecasts, and market prices (Nakasone et al., 2020).
In Nigeria, farmers' preferred agricultural information obtained from agricultural extension workers from the ministry of agriculture over other sources of information owing to the mandate that has been accorded to them. Television has numerous programs that deliberate on farming techniques giving insights on the farming methods, techniques, prospects, opportunities and challenges pertaining agriculture and its related activities such as weather forecasting, farm inputs, market, crop diseases and control techniques (Adenkunle, 2004). In addition, Food and Agricultural Organization of the United Nations (UN), stated that electronic databases serve as reliable sources of agricultural information by way of providing free or low cost access to major scientific journals of agricultural research and training to public institutions in developing countries. Examples of these include AGRIS, AGORA and AGRICOM. Nigeria recorded a total population of 174.5 million in December 2013 with 70% farmers. In addition to the federal capital territory Abuja, Nigeria has 36 states covering a total area of 923,763km2; out of this vast land area, 91million hectares of land are found to be arable land, and only 42% of this has been utilized for agricultural purposes (Osokoya, Alabi, & Fagbola., 2014). Ibrahim, Jing, Abdu, Sanusi and Sanda (2018) observe that Kano is the most populous state in Nigeria with a population of 9,383,682 and an area of 20,131 km^2 of which 18,684 km^2 are cultivable, 75% of the total population engaged in agriculture.

The ministry of agriculture in Nigeria provides agricultural information to rice farmers in Kano through the Kano Agricultural and Rural Development Agency (KNARDA) via field extension staff and the broadcasting media (Ololade & Olagunju, 2017). On the other hand, agricultural extension systems frequently fail due to insufficient farmer involvement about their information needs, limited services and un-matching ratio of the employees and farmers (Olajide, 2018). Even with the advent of information and communication technologies which has made information access, utilization and storage easy for farmers, Opara (2008) argued that, majority of farmers in Kano rely on extension agents for agricultural information followed by fellow farmers, radio and television. This is directly and indirectly linked to the skills and competencies rice farmers require to enhance their farm production (Aina, 2007).

Statement of the Problem

Farmers' agricultural information literacy is crucial for agricultural progress. Nigeria is rich in subsistence crops such maize, maize, beans and sorghum, but production has fallen in recent years, causing recurrent famine. Unrealized agricultural information abilities cause poor production and food insecurity, especially in Kano state. Rice growers in Kano State, Nigeria, are producing less (Wudil et al., 2020).

Rice farmers in Kano State, Nigeria, struggle to get timely, accurate, and relevant agricultural information, which lowers production (Yunusa et al., 2019). Agriculture extension services, research institutes, input providers, and digital platforms are becoming more accessible, yet farmers may lack the information literacy abilities to use them (Adebayo et al., 2020). The adoption of novel agricultural practises and technology requires information literacy, the capacity to locate, analyse, and use information to solve issues or make choices. Rice farmers in Kano State, Nigeria, struggle to improve production, manage resources, and adjust to changing market circumstances and environmental issues due to low information literacy (Suleiman et al., 2019).

The government of Kano State's efforts to raise rice farmers' agricultural information literacy by providing agricultural extension services have not yielded the desired literacy level, as most farmers rely on scarce information they get from agriculture-related radio programmes, although farmer characteristics which contribute to underutilization of agricultural information are unknown. Due to poor agricultural yields, this research examined the connection between farmer information literacy and agricultural productivity in Kura, Kano State, Nigeria.

Research Objective

To assess the relationship between farmer information literacy and agricultural productivity in Kura, Kano State Nigeria.

Research Question

What is the relationship between farmer information literacy and agricultural productivity in Kura, Kano State Nigeria?

Research Methodology

This study employed a descriptive research design. The adoption of descriptive research paradigm was based on its basic features of describing, explaining and interpreting contemporary life event or certain activity at a particular pointing time. This design enabled the researcher identify analyse and discuss the agricultural information access of rice farmers in Kano State. This research was carried out in Kura, Kano State-Nigeria. Kano State is located in the North-western part of Nigeria, and the state has been traditionally considered as the food basket of the Nigerian populace, (Anugwa & Agwu, 2019). It has a population of about nine million people (National Population Commission, 2006). Annual growth rate is estimated at 2.27%, (Raimi et al, 2020) and this puts the population of the state in 2020 at 13,897,103 people.

Farming is the primary economic activity of the inhabitants of Kura. The Tiga Dam, which resulted from the project was built in this area as well, the first of its kind in Nigeria developed by the Audu Bako led-government and later adopted by the Federal Government, transmuting into Hadejia Jama'are River Basin Development Authority (HJBRDA) that covers an area of 45,000 square Kilometres and has the largest functional irrigation scheme of 21,000 Hectares (Indabawa, 2023).

The target population for this study comprised 2,836 in Kura Local Government in Kano State Nigeria. Kura local government is made up of five wards namely; Karfi, Kura, Bugau, Kosawa and Kanwa. The sample size determination was based on Krejcie and Morgan (1970) Sample Size Determination Table for ±5% precision and 95% confidence levels. It stated that when the population is 6,340 at ±5% precisions, 364 should be the sample at a 95% confidence level. Due to the uneven number of Rice Farmers across the wards in Kura Local Government, sample size was calculated proportionately using Krejcie and Morgan's

recommended formula. The sample size was therefore made up of 284 respondents. Structured questionnaire was designed essentially to collect information that relate to participant's demographic profile such as age, gender, duration and scope of practice, marital status, and educational background Descriptive Statistics was used to identify and analyse the information needs of rice farmers, the information awareness and sources of information of the rice farmers.

Results and Discussion

A total of 284 samples of questionnaire were administered to the respondents who were selected from 284 households in Kura Local Government. The study realized a response rate of 93%. It was clear that 93% of questionnaire distributed to the heads of households were successful retrieved by the researcher. Demographic results revealed that majority of the respondents who voluntarily participated in the research were between the ages of 30 and 39 years with 34% respondents, followed by 30% respondents who were between the ages 20 – 29 years, then, 17% respondents were between the ages of 40 to 49 years and farmers of 50 years and above constituted 10% respondents, 3% respondents were less than 20 years of ages. Regarding level of education, majority of the respondents were from non-formal education with 40%, it is followed by Qur'anic education with 30% of the respondents, then, graduates of tertiary institutions realized by 18% respondents, Secondary education 6.3% respondents and primary education 5.7% respondents respectively. In rems of experience, 30% of the respondents have 6 to 10 years' experience in rice farming, and rice farmers with less than 5- year experience constitute 25% respondents. The rest include rice farmers with between 11 and 20 years' experience in rice farming constitute 24% of the respondents and rice farmers with above 20 years' experience were 21% of the respondents.

Descriptive Analysis

Farmer information literacy is an important factor that can contribute to an increase in Agricultural productivity. Information literacy refers to the ability of farmers to access, evaluate, and use information effectively to make informed decisions and improve their farming practices. When farmers have access to reliable and relevant information, they can make better decisions about which crops to plant, when to plant them, how to manage pests and diseases, and how to optimize yields. This can lead to an increase in productivity, as farmers are able to make more informed choices that are tailored to their specific needs and circumstances.

Furthermore, farmer information literacy can lead to improved efficiency in farm operations. When farmers have access to information about new technologies, tools, and techniques, they can optimize their operations and reduce waste. For example, by using precision agriculture techniques such as GPS mapping and sensors, farmers can optimize fertilizer and water use, leading to reduced costs and increased yields. Data were elicited from heads of 284 households in Kano state whom were voluntarily participated in the study. The study used quantitative analysis to analyze the information literacy of the respondents and correlational analysis to examine the relationships between information literacy and productivity of the respondents. Table 1 shows descriptive statistics on identification of various sources of information.

Table 1: Identification of Various Sources of Information

Response	Percentage
Yes	56.3
No	32.2
Undecided	13.5
Total	**100.0**

Table 1 indicated that majority of the respondents (56.3%) were aware about various sources of information whereas 32.2% were not aware and 13.5% remained undecided. This implies that most of the rice farmers

in Kano State, Nigeria are informed about multiple sources of agricultural information sources, thus they have access to diverse sources of information. Access to diverse sources of agricultural information can help these rice farmers make informed decisions about their farming practices. For example, farmers can use weather forecasts to determine when to plant or harvest their crops, or use market information to make decisions about what crops to grow and how much to produce. Also, farmers who have access to a variety of agricultural information sources are better equipped to manage risks associated with farming, such as droughts, floods, and pests. This can help mitigate the negative impact of these risks on crop yields and ensure improved productivity performance. The respondents were also asked to indicate their ability to use ICT in their agricultural work or to access agricultural information. The findings were as shown in Table 2.

Table 2: Ability to Use Information and Communication Technologies (ICTs)

Response	Percentage
Able	18.5
Unable	73.2
Undecided	8.3
Total	**100.0**

Based on the results in Table 2, majority (73.2%) of the respondents indicated that they did not have the ability to use ICT, 18.5% of them had the ability to use ICT whereas 8.3% others were not sure. This indicates that most of the rice farmers in Kano State do not have the ability to use ICT (Information and Communication Technology). Therefore, it is important to consider alternative methods of delivering agricultural information to them. Extension workers are trained professionals who work directly with farmers to provide them with information and guidance on agricultural practices. In addition, these extension workers can provide advice on a wide range of topics, from crop management to marketing strategies, and can help farmers implement new technologies and practices. To assist farmers who do not have the ability to use ICT, printed materials such as brochures, pamphlets, and posters can be distributed to farmers to provide them with information on agricultural practices. These materials can be produced in local languages and can be tailored to specific crops or regions. The respondents were further asked to indicate their abilities to evaluate quality agricultural information. Their responses were as shown in Table 3.

Table 3: Ability to Evaluate Quality Agricultural Information

Response	Percentage
Able	48.1
Unable	27.2
Undecided	24.7
Total	**100.0**

The results presented in Table 3 reveal that nearly half the respondents (48.1%) had the ability to evaluate quality agricultural information while 27.2% did not have the ability to assess quality agricultural information and 24.7% realized as undecided. This implies that most of the rice farmers in Kano State have the ability to evaluate the quality of agricultural information, thus are able to make effective decisions on crop management practices, market trends, and other aspects of farming. If farmers are unable to evaluate the quality of information, they may make poor decisions that could lead to reduced crop yields or financial losses.

There is a lot of misinformation in the agricultural sector, and the rice farmers need to be able to distinguish between accurate and inaccurate information. If farmers are unable to evaluate the quality of information, they may be misled by false or misleading information, which could have negative consequences for their crops and their livelihoods. Therefore, the ability of rice farmers to evaluate the quality of agricultural

information is crucial for effective decision-making, avoiding misinformation, adapting to changing conditions, and increasing productivity. Table 4shows descriptive analysis results on rice farmers' ability to communicate effectively in seeking and sourcing for information.

Table 4: Ability to Communicate Effectively in Seeking and Sourcing for Agricultural Information

Response	Percentage
Able	61.2
Unable	23.2
Undecided	15.6
Total	**100.0**

Table 4 indicated that more than half the respondents (61.2%) had the ability to communicate effectively in seeking and searching for information, 23.2% did not have and 15.6% were not sure whether they had the ability or not. This implies that majority of rice farmers in Kano State are able to communicate effectively in seeking and sourcing for information, thus are likely to get the right agricultural information. Effective communication is essential for rice farmers when seeking and sourcing agricultural information. This is because good communication skills allow farmers to effectively ask questions and seek out information from different sources.

Farmers who are able to communicate effectively can reach out to extension agents, other farmers, or government officials to access relevant and up-to-date information on best practices, crop management, or market trends. Conversely, farmers who are not able to communicate effectively can also not share information with their peers. Effective communication can create a network of knowledge exchange and help disseminate information across communities and thus farmers can share information on their experiences, new technologies or techniques, and best practices, thereby enhancing the knowledge base within the community. The farmers were also asked to indicate their ability to evaluate and use information efficiently. The findings were as shown in Table 5.

Table 5: Ability to Evaluate and Use Agricultural Information Efficiently

Response	Percentage
Able	45.3
Unable	35.3
Undecided	19.4
Total	**100.0**

Table 5 revealed nearly half the respondents 45.3%t had the ability to evaluate and use information efficiently, 35.3% did not have while 19.4% were not sure. This implies that most of the rice farmers in Kano State have the necessary skills and knowledge to assess the quality of the information they receive and effectively apply it to their farming practices. This is important because farmers who are able to evaluate and use information efficiently are better equipped to make informed decisions about their farming practices. This can lead to improved crop yields, reduced costs, and increased profits. Farmers who can evaluate and use information efficiently can better manage risks associated with farming, such as weather variability or pest outbreaks. They can also access relevant and up-to-date information on crop management, pest control, or market trends, which allows them to take proactive measures to mitigate potential risks. Additionally, the rice farmers were asked whether they had the ability to access agricultural information from the internet or not. Their responses were captured and summarized in Table 6.

Table 6: Ability to Access Agricultural Information from the Internet

Response	Percentage
Able	23.3
Unable	60.0
Undecided	16.7
Total	**100.0**

Based on the results in the table, more than half the respondents showed that (60%) had the ability to access agricultural information from the internet, 23.3% do not have while 16.7% were not sure. Since majority of rice farmers in Kano State have the ability to access agricultural information from the internet, it means that they have the opportunity to access a vast amount of information on various agricultural topics through online platforms. With access to a wide range of information on crop management practices, market trends, and other aspects of farming, farmers can make more informed decisions. This can lead to improved crop yields, reduced costs, and increased profits. The internet is a rich source of new technologies, techniques, and innovations in agriculture, so when farmers have access to this information, they can adopt new and improved farming practices that can improve their productivity and profitability. The respondents were in addition asked to indicate whether they had the ability to use mobile phones to communicate and retrieve agricultural information or not. Their responses were as shown in Table 7.

Table 7: Ability to Use Mobile Phones to Communicate and Retrieve Agricultural Information

Response	Percentage
Able	33.3
Unable	47.5
Undecided	19.2
Total	**100.0**

Table 7 indicated that nearly half (47.5%) of the farmers had the ability to use mobile phones to communicate and retrieve agricultural information, about a third (33.3%) were not able to use mobile phones to communicate and retrieve agricultural information , whereas 19.2% were not sure whether they had such abilities or not. This indicate that most of the rice farmers in Kano State are up to date with the use of mobile phones to communicate and retrieve agricultural information. This also implies that most of these rice farmers can easily access and share agricultural information with other stakeholders in the sector.

Mobile phones can be used to facilitate communication between farmers, extension agents, researchers, policymakers, and other stakeholders in the agricultural sector. This can help to build networks of knowledge exchange and foster collaboration. Additionally, it is important to note that mobile phones can be used b rice farmers to retrieve and share information on crop management practices, market trends, weather forecasts, and other aspects of farming. This is important in helping farmers make informed decisions and improve their productivity and profitability. Table 8 shows descriptive analysis results regarding the ability of rice farmers in Kano state to use library to access agricultural information.

Table 8: Ability to Use Library to Access Agricultural Information

Response	Percentage
Able	12.3
Unable	79.2
Undecided	8.5
Total	**100.0**

The result from table 8 reveal that only 12.3 % were in position to use library to access agricultural information whereas 79.2% were not able to, and 8.5% were not sure. This implies that the majority of the rice farmers in Kano State may not have access to certain types of agricultural information. The limited ability of rice farmers in Kano State to use a library to access agricultural information may limit their ability to access certain types of information and may have negative consequences for their productivity and profitability. Libraries often have a wide range of materials that offer different perspectives on agricultural issues. Farmers who cannot access these materials may not be exposed to diverse opinions or approaches to farming, which can limit their ability to make informed decisions. This study identified the ability of the respondents in respect of information literacy skills. These include sources of information, use of ICT, quality agricultural information, communicate effectively in seeking for information use of information, access to agricultural information from internet, use of mobile phones, and use of library. The ability to communicate effectively in seeking for information received the highest attention of the respondents with 64.2%. It is followed by various sources with 56.3%. 53.3% and evaluation of quality agricultural information 48.1%. Moreover, use of information efficiently 45.3%, information from internet 23.3%, use of ICT18.5% and use of library 12.3%.

Correlations Analysis

Correlation analysis is a statistical technique used to determine the nature and strength of the association between two or more variables. The technique is used to determine the extent to which changes in one variable are associated with changes in another variable. In correlation analysis, a correlation coefficient is calculated, which is a numerical measure of the strength and direction of the relationship between the variables. The correlation coefficient ranges from -1 to +1, with -1 indicating a perfect negative correlation (as one variable increases, the other decreases), +1 indicating a perfect positive correlation (as one variable increases, the other increases), and 0 indicating no correlation.

Correlation analysis can be useful in identifying relationships between variables and can help in making predictions or in developing strategies to optimize outcomes. However, it is important to note that correlation does not imply causation, and other factors may be influencing the relationship between the variables being studied. The study conducted correlation analysis to assess the strength and the nature of the association between information literacy and Agricultural productivity among rice farmers in Kano State, Nigeria-West Africa. Table 9 shows the correlation matrix.

Table 9: Correlation Matrix

		Agricultural Productivity	**Information Awareness**	**Information Access**
Agricultural Productivity	Pearson Correlation	1.000		
	Sig. (2-tailed)			
Information Awareness	Pearson Correlation	.278**	1.000	
	Sig. (2-tailed)	0.000		
Information Access	Pearson Correlation	.175**	.892**	1.000
	Sig. (2-tailed)	0.000	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

The correlation matrix in Table 9 indicate that information awareness had significant association with agricultural productivity at 0.05 (1-tailed) ($r = 0.278$, $p<1560$), while Information Access depicts a weak significant relationship with Agricultural Productivity at 0.01 (2-tailed) ($r = .175$, $p> 1560$). This implies that

farmers who have higher levels of information literacy are likely to have higher levels of productivity. Farmers who have higher levels of information literacy are more likely to have access to and be able to effectively use information about new technologies, best practices, and market trends. This information can help them to optimize their farming practices, reduce waste, and increase yields. In addition, farmers with higher levels of information literacy are likely to be more efficient and effective in their decision-making processes. They can be better able to evaluate the potential benefits and risks of different courses of action, and make more informed choices that are tailored to their specific needs.

The study also found a weak positive and significant association between access to agricultural information and agricultural productivity among rice farmers in Kano State, Nigeria ($r= 0.175$, $p<1560$). This implies that there is a measurable relationship between the two variables, but the strength of the relationship is relatively weak. This suggests that while access to agricultural information is positively associated with agricultural productivity among rice farmers in Kano State, other factors may also be contributing to productivity. The significance of the association indicates that the relationship between access to agricultural information and agricultural productivity is not due to chance, and that the finding is likely to be applicable to the broader population of rice farmers in Kano State. However, the weak strength of the association suggests that further research may be necessary to identify additional factors that may be impacting productivity.

The findings are consistent with Oyewole *et al.* (2013), who investigated the role and contributions of information and communication technologies in the development of agriculture in the Ibadan North West area council of Nigeria. The survey included well-structured questionnaires and a random sample of 50 respondents, with data analysis using frequency counts, percentages, and Pearson Product Moment Correlation. The results indicate that around 58 percent of respondents have utilised ICT for between one and five years. Additionally, the study discovered a significant correlation between ICT and agricultural progress. Büyükbay and Gündüz (2013) found a strong correlation between computer and internet use and an individual's social and economic features. It was advised that agricultural researchers have access to the internet in order to increase their utilisation and contributions to agricultural development.

Conclusion

The study concludes that there is a strong positive and significant relationship between farmer information literacy and productivity increase. Farmers who are information literate are better able to access and use agricultural information to improve their farming practices. For example, they can use information on new farming techniques, pest and disease control, and soil management to increase their yields and reduce their production costs. Moreover, farmers who are information literate are more likely to use improved seeds, fertilizers, and other agricultural inputs, which can significantly increase their productivity. They can also access market information, which helps them to make informed decisions on when and where to sell their produce to get the best prices.

The study further concludes that rice farmers who lack information literacy are more likely to rely on traditional farming practices that may not be as productive or efficient. They may also struggle to access and use vital agricultural information, limiting their ability to improve their farming practices and increase their productivity. Also, information literacy is crucial for rice farmers in Kano State to increase their productivity. As such, efforts should be made to promote information literacy among farmers, including providing training and support for farmers to access and effectively use agricultural information. This will ultimately improve the livelihoods of rice farmers in Kano State and contribute to the overall growth of Nigeria's agricultural sector.

Recommendations

Based on the findings and conclusions, this study concludes that there is need to involve farmers in assessing their information needs. The involvement of rice farmers in the assessment of their information needs is

crucial. Farmers should be engaged in the process to identify their needs, challenges, and opportunities. This approach can help ensure that the assessment captures the actual information needs of farmers. The government and other stakeholders should use a participatory approach in involving rice farmers in Kano State. A participatory approach involves working with rice farmers to identify their information needs, as well as developing and implementing solutions that are tailored to their needs. This approach can help ensure that the information provided is relevant, appropriate, and useful for the farmers.

Additionally, there is need for the government and extension officers to consider the local context when assessing the information needs of rice farmers in Kano State. This involves understanding the local agricultural practices, the socio-economic conditions of the farmers, and the available communication channels for delivering information. Rice farmers in Kano State should adopt a variety of information sources. A variety of information sources should be considered when assessing the information needs of rice farmers; these sources should include agricultural extension services, research institutions, agro-input suppliers, local radio, and other media outlets. This approach ensures that farmers have access to a range of information sources and can select the most appropriate for their specific needs.

Moreover, it is essential to monitor and evaluate the process of assessing the information needs of rice farmers. This helps to identify any gaps in the process and to make improvements for future assessments. Evaluation can also help to measure the impact of the information provided on the farmers' productivity and livelihoods. Rice farmers in Kano State should be trained and educated on the various sources of agricultural information available to them. This should include information on the internet, agricultural extension services, mobile applications, and other sources. Farmers should be trained on how to access and effectively use these sources to improve their farming practices. Agricultural information needs to be developed in the local language and tailored to the local context. This will help farmers understand and use the information effectively since it is essential to consider the literacy levels of the farmers and ensure that the information is presented in a simple and easy-to-understand manner. There is need to for the relevant bodies in the agriculture sector in Nigeria to increase access to agricultural extension services which should also be strengthened to increase their reach and effectiveness. This can be achieved through the recruitment and training of more extension workers and the provision of resources such as vehicles, equipment, and communication tools.

Furthermore, the government should develop and disseminate localized agricultural information to rice farmers in Kano State. The agricultural information needs to be developed in the local language and tailored to the local context to help in ensuring that the information is relevant and useful for rice farmers in Kano State. Efforts should be made to increase the access of rice farmers in Kano State to local and international markets. This will help to improve their income and incentivize them to increase their productivity. Moreover, policies should be monitored and evaluated to ensure their effectiveness in improving farmer information literacy and agricultural productivity performance, this will help to identify areas for improvement and refine policies to achieve the desired impact.

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