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Cover Page Footnote

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UTILIZATION OF AGRICULTURAL INFORMATION AND KNOWLEDGE FOR IMPROVED PRODUCTION BY RICE FARMERS IN ONDO STATE, NIGERIA

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ABSTRACT

The main objective of this study was to examine the utilization of agricultural knowledge and information by rice farmers in Ondo State, Nigeria. Multistage random sampling technique was used to select a sample size of 80 respondents. Primary data was collected with the aid of a well-structured interview schedule. The data collected was analyzed with both descriptive and inferential statistics. The results of the study revealed that rice farmers in the study area have a variety of information needs including information on pests and diseases management practices, mechanical land preparation and planting, use of farm machines, improved storage methods and agricultural credit/loan. Key sources of information used by the respondents were friends and relatives and radio. Access to and utilization of agricultural information and knowledge on improved rice production cultural practices were generally high among the respondents as the ground means were both 3.23. The result of the linear regression analysis indicated a significant relationship between farm size (b=0.802, t=12.104; $p \leq 0.05$. Also, the result of the correlation analysis revealed that there was a significant relationship between respondents' access to extension services and utilization of agricultural information and knowledge (r=0.259; $p \leq 0.05$).

Rice (*Orysa sativa*) is an important staple crop in Nigeria. It has witnessed some remarkable developments particularly in the past ten years (Moses and Adebayo 2007). It is relatively easy to produce and is grown for sale and for home consumption. Nigeria has a potential land area of about 4.6 billion hectares for rice production, however, only 1.7 million hectares are grown with rice (Imolehin and Wada 2000). The limited capacity of the Nigerian rice sector to meet the domestic demand has been attributed to several factors; notable among them is the declining productivity due to low access to and utilization of agricultural knowledge and information (Imolehin and Wada 2000). Availability of sustainable agricultural technologies for Nigerian resource-poor rice farmers is important due to the country's effort at achieving food security. Generation of these agricultural research technologies are meaningful only when they are accessed and utilized at the farm level (Umeh and Chukwu 2015).

To enhance the Nigerian agricultural sector's production and productivity, one option would be to increase farmers' access to and effective utilization of agricultural information through identifying and working on the problems that affects the access to and utilization of agricultural information (Obidike 2011).

The wide use of various information technology facilities in Agricultural Development Programs in various regions of the country including Ondo State, have been generally acknowledged (Arokoyo 2007). These facilities include: radio, television, mobile phone, projector, media van, telephone, geographical information system (GIS), print media and the recently introduced internet connectivity. However, what may be paramountly important may not just be the existence of these facilities but how accessible they are to the change agents and farmers in particular. Equally relevant, is knowledge of the disposition of the farmers to the utilization of information and communication technologies in carrying out their farming activities (Arokoyo 2007).

PROBLEM STATEMENT

Rice production has failed to meet the demand in the country in spite of the potentials farmers have to do so. This has affected the demand and supply balance in the domestic market. It has also raised a great concern among all stakeholders involved in the rice production. Achieving sustainable agricultural development is not only based on material inputs (such as seeds and fertilizer) but on the institutions and people involved (FAO and Gesellschaft fur Technische Zusammenarbeit 2004). Availability of adequate information on production techniques and the application of technologies are indispensable to improving the production and productivity of rice. This is because information and technology are the most important inputs for agricultural development (Dulle 2000).

The agricultural extension workers play an important role in linking researchers and farmers. This ensures that agricultural information resulting from agricultural research is utilized by farmers for agricultural development. However, most of the extension approaches employed in the government extension programs are not participatory but top down in many matters. Agbamu (2005) agreed that in many developing countries, too little attention is paid to the understanding of farm-level realities. Always, there is a wide gap between those responsible for preparing and carrying out development plans and the farmers themselves. Frequently farmers in developing countries, who constitute extension clients, are never involved in planning the extension program but rely on the superficial observation of field officers or armchair deductions and rely on generalization of program planners. This has been reflected on the continuous reduction in rice production. People are valuable resources, and the information they hold is useful, but far more so if shared with others. This is the dilemma facing many extension systems – how

to find a balance between information overload and insufficient information for those that need it, like the rice farmers to increase production. It was based on this foregoing that the study attempted to examine the utilization of agricultural information and knowledge for improved production by rice farmers in Ondo State, Nigeria.

OBJECTIVE OF THE STUDY

The main objective of this study was to examine the utilization of agricultural information and knowledge for improved production by rice farmers in Ondo State, Nigeria.

SIGNIFICANCE OF THE STUDY

To improve on the productivity of rice farmers, agricultural information and knowledge has to be accessed and utilized by rice farmers. Hence, this study determined their present level of access to and utilization of agricultural information and knowledge and examined the effect on their cultivation practices and their output. It identified their needs and the constraints they face which will aid in providing empirical information on how various stakeholders will help the farmers to meet their needs and reduce their problems. It also determined the effect of extension activities in accessing and utilizing agricultural information and knowledge.

HYPOTHESES

The following hypotheses were tested:

H_1: No significant relationship exists between the socioeconomic characteristics of the respondents and their output level.

H_2: No significant relationship exists between access to agricultural information and knowledge and the cultivation practices of the respondents.

H_3: No significant relationship exists between access to extension services and utilization of agricultural information and knowledge.

METHODOLOGY

Study Area

The study was carried out in Ondo State. The State is bounded on the East by Edo and Delta States, on the West by Ogun and Osun States, on the North by Ekiti and Kogi and on the South by the Bight of Benin and the Atlantic Ocean. The State has 18 Local Government Areas with an approximate land area of 14,793,186

square kilometers and a population of about 3,441,024 (National Population Commission 2006). The state lies between longitudes 4.30° and 6° East of the Greenwich meridian, 5.45° and 8.15° North of the equator. It is 396 meters elevation above the sea level and lies in the tropic that often has high temperature throughout the year and heavy rainfall. The climate is hot and humid, influenced by rain-bearing southwest monsoon winds from the ocean and dry northwest winds from the Sahara Desert. The rainy season lasts from April to October while the dry season last from November to March with rainfall of about 1524mm per year. Temperatures vary from 28°C to 31°C with mean annual relative humidity of about 80%. The state is agrarian and food crops grown are yam, maize, cassava, rice, plantain, banana, cocoyam, ginger, potatoes, tomatoes, fruits and vegetables while cash crops cultivated include cocoa, coffee, rubber, kola nut, oil palm, cashew and raffia. Also, animals like cattle, goats, sheep, rabbits and poultry are reared in the study area. Apart from agriculture they also engage in trading, crafting and other commercial activities.

Sampling Technique and Size

The study used multistage sampling technique. In the first stage, two (2) Local Government Areas (LGAs) namely: Akure South and Akure North out of the 18 LGAs in Ondo State were purposively selected based on the large number of rice farmers in the area. Secondly, four communities from each LGA were randomly selected. Thus, a total of eight (8) communities were selected for the study. Each community was divided into two (2) geographical wards; snow balling technique was used to collect data from five (5) farmers in each ward making a total of ten (10) farmers in each selected community making a total of eighty (80) respondents for the sample size. Data for this study was collected from primary and secondary sources. The primary data was obtained through a well-structured interview schedule. The secondary data was obtained from previous publications such as journals, internet, conference proceedings and relevant textbooks. Data collected was analyzed using descriptive statistics (frequency distribution tables, mean, standard deviation, percentages) and inferential statistics (regression analysis and Pearson Product Moment Correlation). The inferential statistics were used to test the significance of the three (3) hypothesis set for the study. The Statistical Package for Social Sciences was used to analyze the data collected from the respondents.

RESULTS AND DISCUSSION

The study showed that the mean age of the respondents was 51 years (see Table 1). The age distribution revealed that majority (62.5%) of the respondents were within the age brackets of 46–64 years. This is an indication that rice farming is

TABLE1. SOCIOECONOMIC CHARACTERISTICS OF RESPONDENTS (N=80).

CHARACTERISTICS	CATEGORY	FREQ.	%	MEAN
Age (in years) . . .	less than 25	-	-	51
	25-34	4	5.0	
	35-44	17	21.25	
	45-54	29	36.25	
	55-64	21	26.25	
	65 and above	9	11.25	
Sex	Male	65	81.2	
	Female	15	18.8	
Marital status . . .	Single	3	3.8	
	Married	77	96.2	
	Divorced	-	-	
	Separated	-	-	
	Widowed	-	-	
Education status .	Formal	72	90.0	
	Non-Formal	8	10.0	
Education status if	Attempted Primary School	1	1.4	
formal	Completed Primary School	21	29.2	
	Attempted Secondary School	7	9.7	
	Completed Secondary School	26	36.1	
	Tertiary	17	23.6	
Ave. household	1-5 persons	21	26.2	7
Size	6-10 persons	52	65.0	
	> 10 persons	7	8.8	

dominated by middle-aged farmers. This supports the assertion of Adebayo (1999) that these days, the active young men and women (26–35 years and 36–45 years) who should form the bulk of the work force have deserted the rural communities and moved to the cities in search of government employment. Obviously this trend has not encouraged rural productivity as it has left farming in the hands of the old, the illiterate and very few energetic young men who live in the villages, perhaps only due to unavoidable circumstances. This shows that most of the respondents would probably not patronize a variety of information sources. Adeogun, Olawoye, and Akinbile (2010) opined that younger farmers would most likely be willing to spend more time to obtain information on improved technologies compared with the old farmers. Findings also showed that majority (81.2%) of the respondents were males and 18.8% were females. This implies that farming in the study area is male-dominated. This observation is not surprising as farming activity is essentially a tedious work that requires enormous strength and energy. Nweke (1980) and King (1972) revealed that men perform more difficult farming operations, such as

land preparation (clearing bushes and making of mounds and ridges) while women and children perform lighter operations, such as planting, fertilizer application, weeding etc. The study showed that 96.2% were married while only 3.8% were single. The results revealed that majority (90%) of the respondents had some level of formal education. According to Dulle and Aina (1999), education affects information accessibility, comprehension and adoption of new agricultural innovations and practices. Educated farmers can easily access information from various sources, and can create knowledge out of those sources (Ajala 1992).

OTHER CHARACTERISTICS OF THE RESPONDENTS

The results revealed that the majority (80%) were engaged in farming as their primary occupation. This corroborates the assertion that in Nigeria, most rural households engage in agriculture that contributes significantly to the Gross Domestic Product (GDP) and employing about 77% of the working population (CBN, 1998). About 42.5% of the farmers had farm sizes ranging between 2.6-5.0 hectares while about 32.5% had farm size of less than 2.5 hectares. The mean farm size of the farmers was 2.7 hectares, implying that farming activity was dominated by medium-scale farmers in the study area.

The mean quantity of rice harvested was 7.7 tonnes. Findings showed that the quantity of rice harvested in tonnes per planting season that is usually a year by most (46.3%) of the respondents ranged between 5-9 tonnes. The result reinforces the fact that the farmers are small scale farmers; hence, there will still be a level of dependence on imported rice. The income realized by the farmers from the sale of rice per planting season (expressed monthly and without deducting expenses made during production) was considered. Results showed that 31.3% earned between ₦25,000–₦49,999, 22.5% earned between ₦50,000–₦74,000 and 18.7% earned between ₦75,000–₦99,000. This is an indication that the income of the farmers was relatively small; hence, they may not possess the capital required to access necessary agricultural information services. According to Swanson (1997), farmers with good harvest and high income are the ones who always search for different information regarding their farming activities. Faro 44 (65.1%) was the main variety grown by the rice farmers in the study (Table 3). This was followed by Nerica 8 (26.5%), Faro 52 (12.0%) and Nerica L19 (6.0%).

SOURCES OF AGRICULTURAL INFORMATION AND KNOWLEDGE FOR RICE FARMERS

Results in the Table 2 show that the respondents' major sources of information were friends and relatives (95.2%), radio (92.8%) and input suppliers (91.6%) The implication is that most of the respondents relied on interpersonal sources in accessing agricultural information, probably because of their regular availability

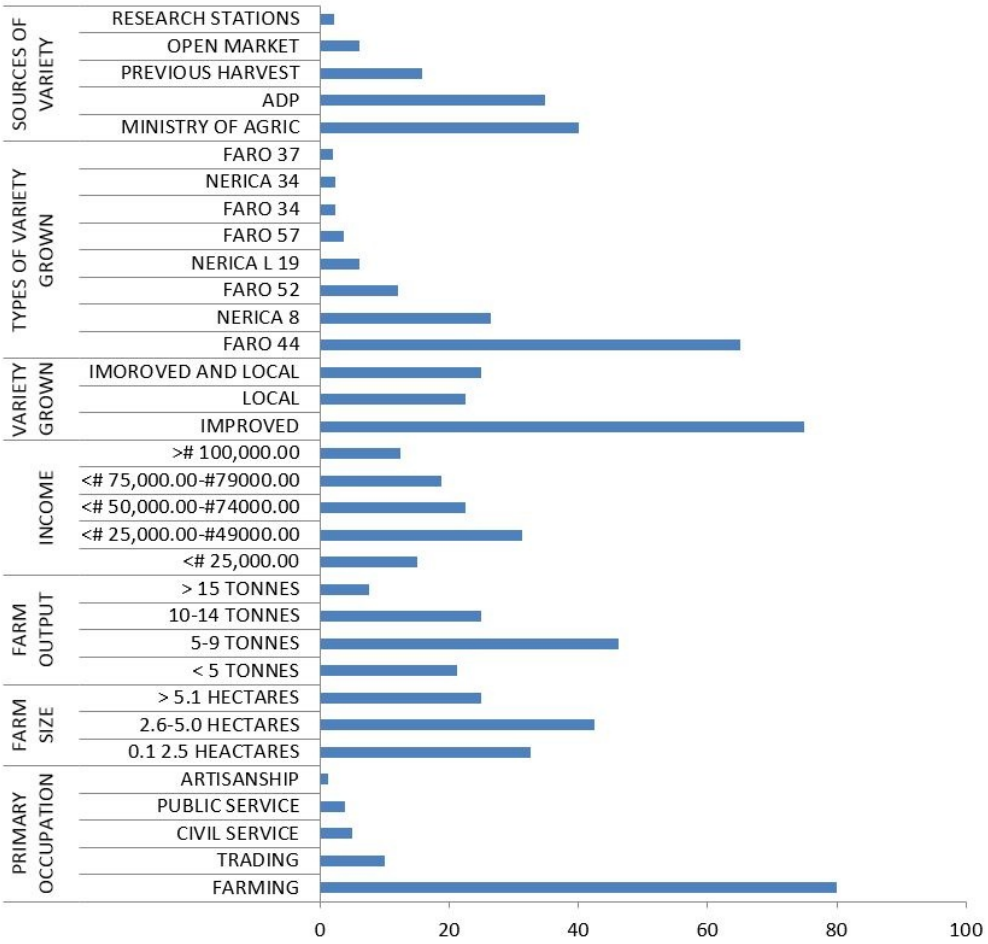

FIGURE 1. OTHER CHARACTERISTICS OF THE RESPONDENTS.

and accessibility. Tandi Lwoga, Stilwell, and Ngulube (2011) for instance stressed that interpersonal sources such as friends, family members and neighbors have all the time become the main providers of the agriculture information due to their credibility, reliability and most of all; they are trusted by the rural community. These findings are supported by Mntambo (2007) who reported that farmer-to-farmer contacts enable farmers to exchange news and adopt new technology, especially from experienced fellow farmers.

AGRICULTURAL INFORMATION AND KNOWLEDGE NEEDS

As presented in Table 3 below, majority (89.2%) of the farmers needed information on pests and diseases management practices, mechanical land preparation and planting (89.2%), use of farm machines (85.5%), improved storage methods (81.9%), agricultural credit/loan (73.5%), use of modern rice milling

TABLE 2. DISTRIBUTION OF RESPONDENTS BY THEIR SOURCES OF AGRICULTURAL INFORMATION AND KNOWLEDGE (N=80).

SOURCES	FREQUENCY	PERCENTAGE
Friends and relatives	79	95.2
Radio	77	92.8
Input suppliers	76	91.6
Personal experience	73	88.0
Farmers' association	69	83.1
Conference and seminars	63	75.9
Cell phones	63	75.9
Agriculture extension officers/agents	59	71.1
Community leaders	53	63.9
Television	47	56.6
Print media	35	42.2
Ministry	32	38.6
ADP	25	30.1
Customers	1	1.2
Internet	-	-
Library	-	-
Information center	-	-

NOTE: *Multiple Responses

(66.3%), weather condition (66.3%) improved processing (61.4%), improved method of weed control (59.0%). This means that most farmers did not know where to get credit, hire tractors or purchase agricultural tools such as power tillers, which could be used to improve their agricultural productivity. Munyambonera et al. (2012) added that availability and access to adequate and timely information on low cost credit from different institutional sources is very important especially to small and marginal farmers. Also, the farmers complained about lack of currently and timely information on weather conditions, this is probably because of climate change that had resulted on unpredictable rains and variability hence farmers fail to plan the right time to plant their crops (Kato 2007).

LEVEL OF ACCESS TO INFORMATION ON IMPROVED RICE PRODUCTION CULTURAL PRACTICES

The ground mean of the study was 3.23 (Table 4). The result showed that farmers had very high access to appropriate spacing ($\bar{x}$=3.89), appropriate planting date ($\bar{x}$=3.89), zero tillage ($\bar{x}$=3.86), recommended seed rate ($\bar{x}$=3.85), improved nursery ($\bar{x}$=3.85), timely transplanting ($\bar{x}$=3.85), planting depth ($\bar{x}$=3.85), appropriate fertilizer application ($\bar{x}$=3.75), use of agrochemicals ($\bar{x}$=3.66) and recommended irrigation method ($\bar{x}$=3.60); high access to the use of improved varieties ($\bar{x}$=3.25) and improved method of weed control ($\bar{x}$=3.07) and low access

TABLE 3. DISTRIBUTION OF RESPONDENTS BY THEIR AGRICULTURAL INFORMATION AND KNOWLEDGE NEEDS (N=80).

INFORMATION NEEDS	FREQ.	%
Pests and diseases management practices . .	74	89.2
Mechanical land preparation and planting	74	89.2
Use of farm machines	71	85.5
New storage methods.	68	81.9
Agricultural credit/loan	61	73.5
Use of modern rice milling	55	66.3
Weather condition	55	66.3
Improved processing	51	61.4
Improved method of weed control	49	59.0
Use of improved varieties	32	38.6
Marketing	16	19.3
Use of agrochemicals	12	14.5
Recommended irrigation method	11	13.3
Appropriate fertilizer application	6	7.2
Zero tillage	1	1.2
Recommended seed rate.	-	-
Appropriate spacing	-	-
Appropriate planting date	-	-
Improved nursery	-	-
Timely transplanting	-	-
Planting depth.	-	-

NOTE: *Multiple Responses

to improved processing ($\bar{x}$=2.49), new storage methods ($\bar{x}$=2.39), use of modern rice milling ($\bar{x}$=2.37), pests and diseases management practices ($\bar{x}$=2.36), mechanical land preparation and planting ($\bar{x}$=2.09) and use of farm machines ($\bar{x}$=2.09). This implies that farmers are constrained in accessing information on mechanization and pests and diseases management and this corroborates with the findings in Table 3 of this study which identified pests and diseases, mechanical land preparation and planting and use of farm machines as the major information needs of rice farmers in the study area. The probable reason might be due to lack of institutions to provide relevant information on the recommended practices.

LEVEL OF UTILIZATION OF INFORMATION ON IMPROVED RICE PRODUCTION CULTURAL PRACTICES

The ground mean of the study was 3.23. The result showed that farmers utilized appropriate spacing ($\bar{x}$=3.90), appropriate planting date ($\bar{x}$=3.90), zero tillage ($\bar{x}$=3.86), recommended seed rate ($\bar{x}$=3.85), improved nursery ($\bar{x}$=3.86), timely transplanting ($\bar{x}$=3.86), planting depth ($\bar{x}$=3.86), appropriate fertilizer application

TABLE 4. DISTRIBUTION OF RESPONDENTS BY THEIR LEVEL OF ACCESS TO INFORMATION ON IMPROVED RICE PRODUCTION CULTURAL PRACTICES.

IMPROVED RICE PRODUCTION CULTURAL PRACTICES	VERY LOW	LOW	HIGH	VERY HIGH	MEAN	STD. DEVIATION
Appropriate spacing	-	-	9 (11.3)	71 (88.8)	3.89	.32
Appropriate planting date	-	-	9 (11.3)	71 (88.8)	3.89	.32
Zero tillage	-	1 (1.3)	9 (11.3)	70 (87.5)	3.86	.38
Improved nursery	-	-	12 (15.0)	68 (85.0)	3.85	.36
Timely transplanting	-	-	12 (15.0)	68 (85.0)	3.85	.36
Recommended seed rate	-	-	12 (15.0)	68 (85.0)	3.85	.36
Planting depth	-	-	12 (15.0)	6 (85.0)	3.85	.36
Appropriate fertilizer application	-	1 (1.3)	18 (22.5)	61 (76.3)	3.75	.46
Use of agrochemicals	-	5 (6.3)	17 (21.3)	58 (72.5)	3.66	.59
Recommended irrigation method	1 (1.3)	5 (6.3)	19 (23.8)	55 (68.8)	3.60	.67
Use of improved varieties	3 (3.8)	13 (16.3)	25 (31.3)	39 (48.8)	3.25	.86
Improved method of weed control	2 (2.5)	19 (23.8)	30 (37.5)	29 (36.3)	3.07	.84
Improved processing	5 (6.3)	42 (52.5)	22 (27.5)	11 (13.8)	2.49	.81
New storage methods	8 (10.0)	42 (52.5)	21 (26.3)	9 (11.3)	2.39	.82
Use of modern rice milling	8 (10.0)	45 (56.3)	16 (20.0)	11 (13.8)	2.37	.85
Pests and diseases management practices	3 (3.8)	51 (63.8)	20 (25.0)	6 (7.5)	2.36	.68
Farm machines	8 (10.0)	63 (78.8)	3 (3.8)	6 (7.5)	2.09	.66
Mechanical land preparation and planting	8 (10.0)	63 (78.8)	3 (3.8)	6 (7.5)	2.09	.66

NOTE: Ground Mean= 3.23; *Figures in parentheses are in percentages

TABLE 5. DISTRIBUTION OF RESPONDENTS BY THEIR LEVEL OF UTILIZATION OF INFORMATION ON IMPROVED RICE PRODUCTION CULTURAL PRACTICES.

IMPROVED RICE PRODUCTION CULTURAL PRACTICES	VERY LOW	LOW	HIGH	VERY HIGH	MEAN	STD. DEVIATION
Appropriate planting date	-	-	8 (10.0)	72 (90.0)	3.90	.30
Appropriate spacing	-	-	8 (10.0)	72 (90.0)	3.90	.30
Improved nursery	-	-	11 (13.8)	69 (86.3)	3.86	.35
Timely transplanting	-	-	11 (13.8)	69 (86.3)	3.86	.35
Zero tillage	-	1 (1.3)	9 (11.3)	70 (87.5)	3.86	.38
Planting depth	-	-	11 (13.8)	69 (86.3)	3.86	.35
Recommended seed rate	-	-	12 (15.0)	68 (85.0)	3.85	.36
Appropriate fertilizer application	-	1 (1.3)	17 (21.3)	62 (77.5)	3.76	.46
Use of agrochemicals	-	5 (6.3)	18 (22.5)	57 (71.3)	3.65	.60
Recommended irrigation method	1 (1.3)	7 (8.8)	18 (22.5)	54 (67.5)	3.56	.71
Use of improved varieties	3 (3.8)	14 (17.5)	23 (28.8)	40 (50.0)	3.25	.88
Improved method of weed control	2 (2.5)	20 (25.0)	29 (36.3)	29 (36.3)	3.06	.85
Improved processing	5 (6.3)	42 (52.5)	22 (27.5)	11 (13.8)	2.49	.81
New storage methods	8 (10.0)	42 (52.5)	21 (26.3)	9 (11.3)	2.39	.82
Use of modern rice milling	8 (10.0)	45 (56.3)	16 (20.0)	11 (13.8)	2.37	.85
Pests and diseases management practices	3 (3.8)	55 (68.8)	17 (21.3)	5 (6.3)	2.30	.64
Farm machines	8 (10.0)	63 (78.8)	3 (3.8)	6 (7.5)	2.09	.66
Mechanical land preparation and planting	8 (10.0)	63 (78.8)	3 (3.8)	6 (7.5)	2.09	.66

NOTE: Ground Mean= 3.23; *Figures in parentheses are in percentages

($\bar{x}$=3.76), use of agrochemicals ($\bar{x}$=3.65) and recommended irrigation method ($\bar{x}$=3.56) to a very high extent; the use of improved varieties ($\bar{x}$=3.25) and improved method of weed control ($\bar{x}$=3.06) were utilized to a high extent and improved processing ($\bar{x}$=2.49), new storage methods ($\bar{x}$=2.39), use of modern rice milling ($\bar{x}$=2.37), pests and diseases management practices ($\bar{x}$=2.36), mechanical land preparation and planting ($\bar{x}$=2.09) and use of farm machines ($\bar{x}$=2.09) were utilized to a low extent. This implies that farmers are constrained in utilizing information on mechanization, new storage methods and pests and diseases management as their level of access to these are also constrained. The probable reason might be due to lack of funds to carry out the recommended practices.

EFFECT OF ACCESS TO AND UTILIZATION OF AGRICULTURAL INFORMATION AND KNOWLEDGE ON OUTPUT

The ground mean of the study was 4.47. The result showed that the respondents strongly agreed that access to and utilization of agricultural knowledge and information has increased their output ($\bar{x}$=4.92), increased their income ($\bar{x}$=4.88), improved the quality of yield harvested ($\bar{x}$=4.84) and they were undecided about it reducing/stopping pests and diseases on their farms ($\bar{x}$=3.24). This implies that access to and utilization of information on improved rice production technologies led to substantial change in yield, income and standard of living of the respondents. This agrees with the findings of Ojo (2009), who posited that adoption of recommended production technologies had significant influence on income of the farmers.

EFFECT OF ACCESS TO AND UTILIZATION OF AGRICULTURAL INFORMATION AND KNOWLEDGE ON CULTIVATION PRACTICES

The ground mean of the study was 4.44. The result showed that the respondents strongly agreed that access to and utilization of agricultural knowledge and information has ensured timely transplant of crops ($\bar{x}$=4.90), encouraged the use of recommended seed rate ($\bar{x}$=4.87), ensured appropriate fertilizer application ($\bar{x}$=4.84), recommended spacing and planting dates ($\bar{x}$=4.83), improved the method of weed control ($\bar{x}$=4.70), encouraged the use of agrochemicals ($\bar{x}$=4.69) and encouraged the use of improved irrigation method ($\bar{x}$=4.66); they agreed that it has enhanced their access to improved varieties ($\bar{x}$=4.31) and they were undecided about it introducing them to mechanized farming ($\bar{x}$=3.44) and improving the method of pests and diseases control on their farms ($\bar{x}$=3.18). This implies that more work has to be done as regards the control of pests and diseases and mechanization in rice farming.

TABLE 6. DISTRIBUTION OF RESPONDENTS BY THEIR EFFECT OF ACCESS TO AND UTILIZATION OF AGRICULTURAL INFORMATION AND KNOWLEDGE ON OUTPUT

EFFECT ON OUTPUT	STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE	MEAN	STD. DEVIATION
It has increased my farm output	-	1 (1.3)	-	3 (3.8)	76 (95.0)	4.92	.38
It has not increased my farm output	76 (95.0)	3 (3.8)	-	1 (1.3)	-	4.92	.38
It has increased my level of income	-	1 (1.3)	-	7 (8.8)	72 (90.0)	4.88	.43
It has not increased my level of income	72 (90.0)	7 (8.8)	-	1 (1.3)	-	4.88	.43
It has improved the quality of my yield	-	1 (1.3)	3 (3.8)	4 (5.0)	72 (90.0)	4.84	.54
It has not improved the quality of my yield	72 (90.0)	4 (5.0)	3 (3.8)	1 (1.3)	-	4.84	.54
It has reduced/stopped pests and diseases on my farm	4 (5.0)	25 (31.3)	2 (2.5)	46 (57.5)	3 (3.8)	3.24	1.09
It has not reduced/stopped pests and diseases on my farm	3 (3.8)	46 (57.5)	2 (2.5)	25 (31.3)	4 (5.0)	3.24	1.09

NOTES:Ground Mean= 4.47; *Figures in parenthesis are in percentages

TABLE 7. DISTRIBUTION OF RESPONDENTS BY THE EFFECT OF THEIR ACCESS TO AND UTILIZATION OF AGRICULTURAL INFORMATION AND KNOWLEDGE ON CULTIVATION PRACTICES

EFFECT ON CULTIVATION PRACTICES	STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE	MEAN	STD. DEVIATION
It has enabled timely transplant of crops	-	-	-	8 (10.0)	72 (90.0)	4.90	.30
It has not enabled timely transplant of crops	72 (90.0)	8 (10.0)	-	-	-	4.90	.30
It has recommended the seed rate I use	-	-	2 (2.5)	6 (7.5)	72 (90.0)	4.87	.40
It has not recommended the seed rate I use	72 (90.0)	6 (7.5)	2 (2.5)	-	-	4.87	.40
It has enabled appropriate fertilizer application	-	1 (1.3)	-	10 (12.5)	69 (86.3)	4.84	.46
It has not enabled appropriate fertilizer application	69 (86.3)	10 (12.5)	-	1 (1.3)	-	4.84	.46
It has recommended the spacing and planting dates I use	2 (2.5)	-	-	6 (7.5)	72 (90.0)	4.83	.67
It has not recommended the spacing and planting dates I use	72 (90.0)	6 (7.5)	-	-	2 (2.5)	4.83	.67
It has improved method of weed control	-	4 (5.0)	-	12 (15.0)	64 (80.0)	4.70	.72
It has not improved method of weed control	64 (80.0)	12 (15.0)	-	4 (5.0)	-	4.70	.72
It has encouraged the use of agrochemicals	-	3 (3.8)	-	16 (20.0)	61 (76.3)	4.69	.67
It has not encouraged the use of agrochemicals	61 (76.3)	16 (20.0)	-	3 (3.8)	-	4.69	.67

TABLE 7. DISTRIBUTION OF RESPONDENTS BY THE EFFECT OF THEIR ACCESS TO AND UTILIZATION OF AGRICULTURAL INFORMATION AND KNOWLEDGE ON CULTIVATION PRACTICES (*continued*)

EFFECT ON CULTIVATION PRACTICES	STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE	MEAN	STD. DEVIATION
It has recommended the irrigation method I use	2 (2.5)	5 (6.3)	-	4 (5.0)	69 (86.3)	4.66	.95
It has not recommended the irrigation method I use	69 (86.3)	4 (5.0)	-	5 (6.3)	2 (2.5)	4.66	.95
It has enhanced my access to improved varieties	1 (1.3)	10 (12.5)	-	21 (26.3)	48 (60.0)	4.31	1.06
It has not enhanced my access to improved varieties	48 (60.0)	21 (26.3)	-	10 (12.5)	1 (1.3)	4.31	1.06
It has introduction me to mechanized farming	7 (8.8)	23 (28.8)	1 (1.3)	26 (32.5)	23 (28.8)	3.44	1.40
It has not introduction me to mechanized farming	23 (28.8)	26 (32.5)	1 (1.3)	23 (28.8)	7 (8.8)	3.44	1.40
It has improved the method of pests and diseases Control	5 (6.3)	26 (32.5)	2 (2.5)	44 (55.0)	3 (3.8)	3.18	1.12
It has not improved the method of pest and diseases Control	3 (3.8)	44 (55.0)	2 (2.5)	26 (32.5)	5 (6.3)	3.18	1.12

NOTES: Ground Mean= 4.44; *Figures in parentheses are in percentages

CONSTRAINTS FACED IN ACCESSING AGRICULTURAL INFORMATION AND KNOWLEDGE ON IMPROVED RICE PRODUCTION CULTURAL PRACTICES

The study revealed that the major challenges faced by respondents in accessing agricultural information were inadequate funds (89.2%), lack of access to adequate extension services (74.7%), lack of information services (49.4%), agricultural information on media is aired at odd hours (37.3%), poor government policies (33.7%) and lack of awareness of information sources. Furthermore, the respondents also claimed that they were also faced with the problem of inability to read and write (14.5%). Having access to agricultural information is an essential ingredient that would always lead to better crop and livestock production in any community. Farmers in Nigeria seldom feel the impact of agricultural innovation either because they have no access to such vital information or because it is poorly disseminated (Ozowa 1995). These findings support the assertion of Benard, Dulle, and Honesta (2014) that due to financial problems, some farmers cannot afford to buy information sources or attend important agricultural workshops/seminars or agricultural shows and that there was lack of adequate funding to meet the transport cost for visiting farmers, to conduct demonstrations and workshops to sensitize the farmers. The findings further revealed the inadequate numbers of extension agents as major challenge constraining farmers from accessing information. This is also in line with what have been found out by Aina (1990), which revealed that the ratio of agricultural extension workers to the population in Africa is low.

TABLE 8. DISTRIBUTION OF RESPONDENTS BY THE CONSTRAINTS FACED IN ACCESSING AGRICULTURAL INFORMATION AND KNOWLEDGE ON IMPROVED RICE PRODUCTION CULTURAL PRACTICES (N=80).

CONSTRAINT	FREQ.	%
Inadequate funds	74	89.2
Lack of access to adequate extension services	62	74.7
Lack of information services	41	49.4
Agricultural information on media is aired at odd hours	31	37.3
Poor government policies	28	33.7
Lack of awareness of information sources	26	31.3
Inability to read and write (illiteracy)	12	14.5
Lack of relevant materials in offices and libraries	9	10.8
Poor knowledge-sharing culture	9	10.8
Poor public relation of the extension workers	8	9.6
Poor radio and television signals	7	8.4
Language barrier	4	4.8

NOTE: *Multiple Responses

CONSTRAINTS FACED IN UTILIZING AGRICULTURAL INFORMATION AND KNOWLEDGE ON IMPROVED RICE PRODUCTION CULTURAL PRACTICES

The results revealed that the challenges faced by respondents in utilizing agricultural information were of lack of credit for technology input purchase/inadequate fund (94.0%), poor economic conditions (90.4%), poor government management and policies (86.7%) inconsistency of information (84.3%), lack of labor (84.3%), not suitable to prevailing agro-ecological conditions (69.9%), untimely information (67.5%), too technical information (60.2%). Furthermore, 49.4% mentioned inadequate facilities/professionals, 42.2% mentioned lack of access to cultivable land, disruption/uncertainties (22.9%), lack of interest (22.9%), language barrier (7.2%) and 4.8% mentioned lack of compatibility with social and cultural values as some challenges constraining farmers in utilizing information. The problems of agricultural development in Nigeria are no longer lack of research results, but utilization of research output by end-users (rural farmers) as instrument of increased food production, economic growth and social progress (Umeh and Chukwu 2013).

The findings revealed that majority of the farmers suffered from financial difficulty. This probably affected the sourcing of information from such sources. It also probably prevented them from trying some innovations available. This implies that only fund is a major problem to information sourcing in the study area. The availability of funds may probably resolve most of the constraints identified. Moreover, the problem of funds probably explains why respondents indicated that they source for information mainly from the extension agents whom they regard as credible source and who usually visited them to offer free services (Daudu, Chado, and Igbashal 2009).

ACCESS TO EXTENSION SERVICES

As shown in Figure 3 below, majority of the farmers (72.5%) had access to extension services; yet 27.5% did not. The use of extension impact is a good platform for introduction and diffusion of novel technologies to the farmers (Nnenna 2013). The results showed that 50.0% and 45.1% had access to extension services quarterly and annually respectively, where as only 4.0% had access to extension services monthly. This implies that access to extension services in the study area is low which supports the findings of Owolabi and Okunlola (2014), that only few farmers have frequent access to extension agents leading to low extension-farmer ratio.

TABLE 9. DISTRIBUTION OF RESPONDENTS BY THE CONSTRAINTS FACED IN UTILIZING AGRICULTURAL INFORMATION AND KNOWLEDGE ON IMPROVED RICE PRODUCTION CULTURAL PRACTICES (N=80)

CONSTRAINTS	FREQ.	%
Lack of credit for technology input purchase/inadequate fund	78	94.0
Poor economic conditions	75	90.4
Poor government management and policies	72	86.7
Inconsistency of information	70	84.3
Lack of labor	70	84.3
Not suitable to prevailing agro-ecological conditions	58	69.9
Untimely information	56	67.5
Too technical information	50	60.2
Incomplete information	47	56.6
Inadequate facilities/professionals	41	49.4
Lack of access to cultivable land	35	42.2
Disruption/uncertainties	19	22.9
Lack of interest	19	22.9
Language barrier	6	7.2
Lack of compatibility with social and cultural values	4	4.8

*Multiple Responses

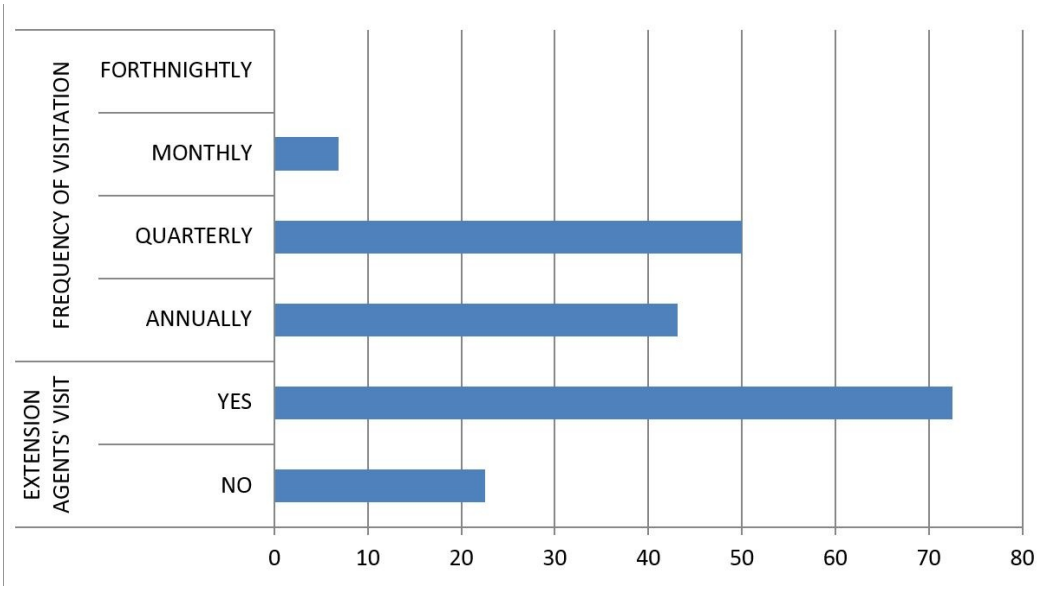

FIGURE 2. ACCESS TO AND FREQUENCY OF EXTENSION AGENTS.

EFFECTS OF ACCESS TO EXTENSION SERVICES

The farmers attested that extension activities affect their farming activities with a ground mean of 4.11. The result showed that the respondents strongly agreed

TABLE 10. DISTRIBUTION OF RESPONDENTS BY THE EFFECTS OF THEIR ACCESS TO EXTENSION SERVICES

EFFECTS	STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE	MEAN	STD. DEVIATION
It has increased my farm output	-	-	-	10 (17.2)	48 (82.8)	4.83	.38
It has not increased my farm output	48 (82.8)	10 (17.2)	-	-	-	4.83	.38
It has enabled the use of new innovations	1 (1.7)	-	-	9 (15.5)	48 (82.8)	4.78	.62
It has not enabled the use of new innovations	48 (82.8)	9 (15.5)	-	1 (1.7)	-	4.78	.62
It has exposed me to better marketing outlets	1 (1.7)	1 (1.7)	-	9 (15.5)	47 (81.0)	4.72	.72
It has not exposed me to better marketing outlets	47 (81.0)	9 (15.5)	-	1 (1.7)	1 (1.7)	4.72	.72
It has created awareness on new or improved technology	-	2 (3.4)	-	30 (51.7)	26 (44.8)	4.38	.67
It has not created awareness on new or improved technology	26 (44.8)	30 (51.7)	-	2 (3.4)	-	4.38	.67
It has created awareness on improved seeds	-	7 (12.1)	1 (1.7)	16 (27.6)	34 (58.6)	4.33	1.00
It has not created awareness on improved seeds	34 (58.6)	16 (27.6)	1 (1.7)	7 (12.1)	-	4.33	1.00
It has enabled the use of better storage facilities	1 (1.7)	6 (10.3)	1 (1.7)	38 (65.5)	12 (20.7)	3.93	.90
It has not enabled the use of better storage facilities	12 (20.7)	38 (65.5)	1 (1.7)	6 (10.3)	1 (1.7)	3.93	.90
It has eradicated pests and diseases on my farm	1 (1.7)	24 (41.4)	1 (1.7)	29 (50.0)	3 (5.2)	3.16	1.09
It has not eradicated pests and diseases on my farm	3 (5.2)	29 (50.0)	1 (1.7)	24 (41.4)	1 (1.7)	3.16	1.09
It has enabled the use of improved processing technology	6 (10.3)	27 (46.6)	3 (5.2)	18 (31.0)	4 (6.9)	2.78	1.20
It has not enabled the use of improved processing technology	4 (6.9)	18 (31.0)	3 (5.2)	27 (46.6)	6 (10.3)	2.78	1.20

NOTES:Ground Mean= 4.11; *Figures in parentheses are in percentages

that access to extension services has increased their farm output ($\bar{x}$=4.83), enabled their use of innovations ($\bar{x}$=4.78) and exposed them to better marketing outlets ($\bar{x}$=4.72); they agreed that it has created awareness on new and improved technologies ($\bar{x}$=4.38), created awareness on improved seeds ($\bar{x}$=4.33) and enabled the use of better storage facilities ($\bar{x}$=3.93). Therefore, the key to increasing the impact of extension efforts is to introduce the various components of a more intensive system of farming, giving special emphasis to the improved processing technology and eradication of pests and diseases as these were considered the main bottlenecks in improving productivity in rice farming.

Hypothesis One

The result of the linear regression analysis in Table 11 shows that there is no significant relationship between the age (b=-0.022, p>0.05), sex (b=0.48, p>0.05), marital status (b=-0.188, p>0.05), educational status (b=-0.089, p>0.05), average household size (b=0.014, p>0.05), average farming experience of the respondents (b=0.059, p>0.05) and their output level. Therefore, the null hypothesis is accepted and the alternate rejected. The relationship between these socioeconomic characteristics and the output level of the respondents is that the characteristics do not determine the output level. It is also shown that there is significant relationship between respondents' farm size and their output level (b=0.802, t=12.104; p≤0.05). Therefore, the null hypothesis is rejected and the alternate accepted. The relationship between the two is that the farm size determines the output level. The implication of this is that if the farm size of the respondent is big, it may affect his or her output level.

TABLE 11. RELATIONSHIP BETWEEN THE SOCIOECONOMIC CHARACTERISTICS OF THE RESPONDENTS AND THEIR OUTPUT LEVEL.

	VARIABLE NAME	REGRESSION COEFFICIENT	STANDARD ERROR	T-VALUE	SIG.
B0	Constant.	0.50	2.48	0.20	0.840
X1	Age	-0.02	0.05	-0.50	0.621
X2	Sex	0.48	0.68	0.70	0.485
X3	Marital status . . .	-0.19	1.22	-0.16	0.877
X4	Educational status	-0.09	0.19	-0.46	0.648
X5	Ave. household size	0.01	0.10	0.15	0.882
X6	Farm size	0.80	0.07	12.10	0.000
X7	Ave. farming experience . . .	0.06	0.04	1.45	0.152

Hypothesis Two

Table 12 shows that there is a significant relationship between the respondents' access to improved varieties (r=1, $p \leq 0.05$), use of agrochemicals (r=0.425, $p \leq 0.05$), method of pests and diseases control (r=0.367, $p \leq 0.05$), fertilizer application (r=0.311, $p \leq 0.05$), transplant of crops (r=0.257, $p \leq 0.05$), seed rate (r=0.211, $p \leq 0.05$), mechanized farming(r=0.282, $p \leq 0.05$), method of weed control (r=0.240, $p \leq 0.05$) and their access to agricultural information and knowledge. The relationship between them is that access to agricultural information and knowledge affects cultivation practices of the respondents. This implies that access to agricultural information and knowledge may determine the cultivation practices used by the respondents. Also, there is no significant relationship between respondents' use of irrigation method (r=0.118, $p > 0.05$), spacing and planting dates (r=0.149, $p > 0.05$) and their access to agricultural information and knowledge. The relationship between them is that access to agricultural information and knowledge does not determine the irrigation method, spacing and planting dates used by the respondents. This implies that access to agricultural information and knowledge may affect the irrigation method, spacing and planting dates used by the respondents.

TABLE 12. RELATIONSHIP BETWEEN ACCESS TO AGRICULTURAL INFORMATION AND KNOWLEDGE AND THE EFFECT ON CULTIVATION PRACTICES.

	r-VALUE	*p*-VALUE	REMARKS
Access to improved varieties	1.00	0.00	Significant
Use of agrochemicals	0.43	0.00	Significant
Method of pests and diseases control.	0.37	0.00	Significant
Fertilizer application	0.31	0.00	Significant
Transplant of crops	0.26	0.01	Significant
Seed rate.	0.21	0.03	Significant
Irrigation method	0.12	0.15	Not Significant
Mechanized farming.	0.28	0.01	Significant
Spacing and planting dates	0.15	0.09	Not Significant
Method of weed control.	0.24	0.02	Significant
Access to agricultural information and knowledge	0.23	0.02	Significant

Hypothesis Three

Table 13 shows that there is significant relationship between respondents' access to extension services and utilization of agricultural information and knowledge (r=0.259; $p \leq 0.05$). Therefore, the null hypothesis is rejected and alternate hypothesis is accepted. This means that the respondents' access to extension services significantly affected utilization of agricultural information and

knowledge. This implies that the respondents may not utilize agricultural information and knowledge because they do not have access to extension services.

TABLE 13. CORRELATION ANALYSIS SHOWING THE RELATIONSHIP BETWEEN ACCESS TO EXTENSION SERVICES AND UTILIZATION OF AGRICULTURAL INFORMATION AND KNOWLEDGE.

	r-VALUE	*p*-VALUE	REMARKS
Extension services vs. utilization of agricultural information and knowledge	0.259	0.01	Significant

CONCLUSION

Information is very important resource for all agricultural activities, and therefore for anything and everything, information is required. The findings of this present study revealed that the rice farmers in Ondo state need information on rice farming, and they used several information sources to get their required information. Although they get assistance from relatives, friends, extension officers, and personal experience, their level and skills in using modern technologies in accessing and utilizing agricultural information is not satisfactory. Besides, lack of information services, lack of financial support, and inadequate number of extension staff, information not easily accessible and lack of awareness of information sources etc. have limited them in accessing and utilizing agricultural information efficiently.

Recommendations

From the findings gotten from this study, the following recommendations are made toward boosting rice productivity in the study area:

1. Adequate workshops, training and awareness should be given to the rice farmers and be promoted by the government and other private organizations.
2. For easy access and effective utilization of agricultural information in this digital age, there is need for establishment of information centers in all rural communities in Nigeria. Such information centers could provide the rural farmers the desired agricultural information in a format that would be comprehensible to them, taking into cognizance the prevailing high illiteracy rate, cultural differences and limited technology.
3. Agricultural research institutes should carry out ways of reducing the invasion of rice farmers by pests especially birds and grass cutters as these are very difficult pests that affect output of the farmers.

4. There should be the development of an efficient distribution network for inputs (supply and delivery system). Coupled with the extension services, these inputs should be made readily available at the appropriate time.

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