CONSTRAINTS ENCOUNTERED IN RICE PRODUCTION BY FARMERS IN OGUN STATE

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ABSTRACT
Rice production has not been able to meet the consumption demand of the rapidly growing population. Hence, this study examined the various constraints encountered by rice farmers in rice production in five LGAs in Ogun State, Southwest Nigeria. Data were obtained through structured questionnaire administered to 100 randomly selected rice farmers from the study area. Data were analysed using descriptive and inferential statistics. Majority of the respondents were within the age bracket of 46-55 years (56.0%), male (94.0%). married (92.0%) and Muslims (52.0%). Forty-six percent had between 4-6 persons in their household, 58.0% had farm size of more than I ha and 56.0% had formal education. Respondents accessed inputs such as seed (80.0%) and fertilizer (80.0%), herbicides (78.0%) from extension agents and agro-allied input dealers. There is restriction to fertilizer (100.0%) and herbicides (100.0%) accessibility, however, seeds (80.0%), labour (100.0%) and land (84.0%) were easily accessible. Majority market their rice on farm (88.0%) and to wholesalers (78.0%). Major production constraints were Quelea birds problem (98.0%), inadequate credit facilities (98.0%), high cost of inputs (96.0%), flood/water logging (80.0%) and pests/diseases (86.0%); processing constraints include high cost of processing equipment (98.0%), low quality of rice produced (98.0%) and breakdown of machine (96.0%); marketing constraints were poor road network (100.0%), poor trade policies (92.0%) and high transportation cost (84.0%); storage constraints include pest infestation (100.0%), poor storage facilities (96.0%) and high cost of storage chemicals (84.0%). It is therefore pertinent for both government and non-government organisations to help in formulating policies that will bring constraints to rice production to the barest minimum.
Keywords: Rice farmers, production constraints, inputs accessibility

INTRODUCTION

Rice is the most economically important food crop in many developing countries and has also become a major crop in many developed countries where its consumption has increased considerably (Ajala and Gana, 2015). It is one of the major cereals widely grown for food in Nigeria as it is grown in paddies or on upland fields, depending on the requirements of the particular variety, as there is limited mangrove cultivation. Philippines and Indonesia were the principal rice importers in the world until recently when Africa has become the highest importer of rice, with Nigeria being at the forefront (The Punch, 2016; Boris, 2004). As at December 2016, the Punch newspaper reported Nigeria as the second highest importer of rice in the world. High rate of rice importation in Nigeria has forced government to take several steps to redress the trend, including placing a total ban on the importation of rice as well as the recent government initiative on rice that is geared towards increasing domestic production. All these happen in the face of abundant potentials the country has in rice production and its capabilities to be self-sufficient in rice production. According to a report by Otung (2017), Nigeria has huge human resources, favourable climate and potential to undergo a steady transformation in terms of techniques and marketing of rice. With the expansion of the cultivated land area of rice, there has been a steady increase in rice production and consumption in Nigeria. Ahmad (2017) reported that local rice production in Nigeria has now reached 15 million metric tonnes annually as claimed by the Nigerian government. Stressing further that the development means the country will

now be saving about N300 billion it used to spend annually on importation of the commodity.

However, the current level of rice production in the country obviously cannot cater for the teeming population of the country. Also, it is important to note that extension activities to rice farmers in Nigeria has been geared towards improving the productivity of small-scale farmers who produce the bulk of the rice in the country (Akinbile *et al*., 2006). Akinbile *et al*., (2006) stated that farmers need to be assisted to have current knowledge of improved sources of information and have access to all inputs needed for effective production. Otherwise, rice farmers will suffer low and decreasing yields owing to increasing production costs and lack of required inputs. With the expansion of the land area under rice cultivation, there has been a steady increase in rice production in Nigeria. However, the increase in production has not been sufficient to meet the consumption demand of the rapidly growing population in Nigeria.

It is important to note that apart from the fact that production cannot meet up with demand in the country that necessitated importation, the yield realised per unit area of land is low, which thus serve as disincentive for farmers, making their profit margin thus low and leading to decrease in domestic rice production in the country. This is due to several constraints in the production chains experienced by farmers. Such constraints occur in production, processing, storage and marketing. Rice cannot be consumed in the form in which it is harvested except it passes through the production chain. The constraints facing farmers in the rice production chain are peculiar to each stage of

production. These constraints reduce rice output and when the output is also not well processed, the economic value of the products becomes reduced. Apart from the fact that constraints reduce significant increase in local productions, it also frustrates efforts to make the local variety qualitative and more attractive to Nigerians. Hence, this study was carried out to x-ray specific constraints associated with rice along the production chain which include production, processing, marketing and storage stages with the aim to proffer workable solutions to the constraints. Other specific objectives of this study include farmers' sources of inputs, input accessibility and marketing channels utilised.

Hypotheses of the study, stated in null form, are as given below;

$H_0 1$ There is no significant relationship between selected personal characteristics of respondents and constraints encountered in rice production.

$H_0 2$ There is no significant relationship between input accessibility and constraints encountered in rice production.

METHODOLOGY

Ogun State was created on 3rd February, 1976 with the state capital in Abeokuta. The state is situated in the tropics covering a land mass of 16,409.26 square kilometres and with an estimated population of over 4 million people. Ogun state falls largely within the rainforest and partly within southern guinea savannah zone of the tropics. Major agricultural produce in the state include cocoa, kolanut, orange, maize, rice, cassava, palm oil, melon and cowpea. The state comprises of 20 Local Government Areas.

The study was conducted in the major rice producing areas in the state. The population of the study include all rice farmers in Ogun state. Purposive sampling was used to select five Local Government Areas known for extensive rice cultivation in the state, namely: Obafemi Owode, Abeokuta North, Ifo, Ewekoro and Ikenne. Ten percent of rice producing communities was randomly selected in each of the selected LGAs. Three communities were selected from Obafemi Owode, while one community was selected each from the other 4 LGAs. Hence, the total number of community selected was 7. Simple random sampling was used to select 10% rice farmers from each community. Ten percent of 427 rice farmers in Obafemi Owode was selected and 10% of 156, 144, 137 and 129 rice farmers in each selected communities in Abeokuta North, Ifo, Ewekoro and Ikenne LGAs were respectively selected to give a total of 100 respondents sampled for this study. Data was collected with the aid of a well structured interview schedule and was analysed using descriptive and inferential statistics. Constraints

encountered along rice value chain (production, processing, marketing and storage stages) was determined using a 4 point scale of very severe, severe, mild and not a constraint with scores of 3, 2, 1 and 0 assigned respectively. The mean of each constraint item was computed and used to rank the constraints in order of severity. Respondents' scores on constraints were also added and the mean was computed. Based on the mean, respondents were categorised as either experiencing low (< mean) or high (≥ mean) level of constraint along the rice value chain. Descriptive statistics used include frequency, percentage, chart and mean, while hypotheses stated for the study were tested using inferential statistics which are chi-square and Pearson Product Moment Correlation.

RESULTS AND DISCUSSION
Personal characteristics of respondents

Table 1 indicates that only 2.0% of the respondents were below 41 years of age. Majority of the respondents were above 50 years of age (66.0%), while 32.0% were between the age category of 41-50 years. The age distribution implies most of the respondents are no longer in their active age. It can be inferred from this findings that the percentage of youths involve in rice production is low in the study area. This might be because most youths have left for urban areas or engaged in other economic activities besides rice production. It was discovered that 85.8% of the farmers were males with only 14.2% were female. This is in line with a similar study carried out in Ekiti State among rice farmers by Osanyinlusi, and Adenegan (2016) where majority of rice farmers were found to be males and this suggests that male farmers dominate rice farming probably due to its nature of intense and time-consuming activities or because women are more engaged in non-farm activities and domestic chores than their male counterparts. Also, it is noteworthy that crop processing activities were mostly done by women. A large proportion of the respondents were married (92.0%). This is expected as majority of the farmers are adults and marriage is a norm in traditional societies where study area is located. The result on marital status corroborates the findings of Alarima et al. (2011) where most rice farmers in Nigeria were found to be married. More than half (56.0%) of the respondents had formal education but this is only at the primary (22.0%) and secondary school (34.0%) levels, implying that at least more than half of the respondents can read and write. This result is consistent with study conducted among *Ofada* rice farmers in Ogun state by Sangotegbe et al (2013) where 32.5% and 21.3% rice farmers were found to be primary and secondary school holders, respectively. However, 44.0% had no formal education. This result of this study corroborates the findings of Banji (2005) that

most rice farmers had no formal education while it disagrees with what obtained among rice farmers in Ekiti State as Osanyinlusi and Adenegan (2016) found that 91.2% had formal education. Majority of the rice farmers were Muslims (52.0%), 46.0% were Christians, while 2.0% were traditionalists. This result aligns with findings by Sangotegbe *et al* (2013) who found that rice farmers in Ogun state predominantly practice Christianity and Islam with few being traditionalists.

Respondents with household size of between 4and 6 persons were 46.0%, 44.0% had household size of between 7 and 9 persons, while 10.0% had between 10-12 persons in their household. This implies that more than half of the respondents had a fairly large household which might be advantageous in terms of family labour. More than half of the respondents (58.0%) had farm size of more than 1hectare, 36.0% had up to 1 hectare of land, while only 6.0% had less than 1 hectare of land. This implies that at least majority of the respondents cultivate more than one hectare of land for rice. This contradicts the findings of Alarima *et al.* (2011) who reported very few rice farmers cultivating more than one hectare of land.

Table 1: Distribution of respondents based on their personal characteristics

Variable	Frequency	Percentage
Age		
< 41	2	2.0
41-45	6	6.0
46-50	26	26.0
51-55	30	30.0
56-60	28	28.0
>60	8	8.0
Sex		
Female	6	14.2
Male	94	85.8
Marital status		
Single	8	8.0
Married	92	92.0
Divorced	0.0	0.0
Widowed	0.0	0.0
Educational status		
No Formal Education	44	44.0
Primary education	22	22.0
Secondary education	34	34.0
Tertiary	0.0	0.0
Religion		
Christianity	46	46.0
Islam	52	52.0
Traditional	2	2.0
Household size		
4 – 6	46	46.0
7 – 9	44	44.0
10 – 12	10	10.0
Farm size		
< 1 ha	6	6.0
1 ha	36	36.0
> I ha	58	58.0

Sources of inputs and information on inputs

Table 2 reveals that the farmers procured their seeds, fertilizer and herbicides mainly from two sources which are extension agents and agro-allied input dealers. All the farmers got seeds, fertilizers and herbicides from extension agents, while majority also get the same set of inputs (seed - 80.0%, fertilizer - 82.0% and herbicides - 78.0%) from agro-allied input dealers. The sources of credit largely explored by rice farmers in the study area were friends (64.0%), relatives (60.0%) and personal savings (88.0%). It was found that very few of the respondents patronised money lenders (12.0%). Furthermore, result shows that all the rice farmers used hired labour in their farm enterprise, while majority (94.0%) also utilised family labour. It can be deduced from this result that only 6.0% of the respondents used hired labour exclusively. Hence, it can be asserted that the sources of labour

largely utilized by rice farmers in the study area are a combination of family and hired labour.

Table 2: Percentage distribution of respondents based on sources of inputs

SN	Sources	Inputs				
		Seed	Fertilizer	Herbicide	Credit	Labour
1	Extension agents	100.0	100.0	100.0	0.0	0.0
2	Agro-allied input dealers	80.0	82.0	78.0	0.0	0.0
3	Friends	0.0	0.0	0.0	64.0	0.0
4	Relatives	0.0	0.0	0.0	60.0	0.0
5	Personal savings	0.0	0.0	0.0	88.0	0.0
6	Money lender	0.0	0.0	0.0	12.0	0.0
7	Bank	0.0	0.0	0.0	0.0	0.0
8	Family	0.0	0.0	0.0	0.0	94
9	Hired labour	0.0	0.0	0.0	0.0	100.0

Degree of access to inputs

Majority of the respondents indicated that they easily had access to seeds (80.0%). However, all the respondents indicated that access to fertilizers and herbicides as being restricted. Access to inputs such as labour (100.0%), land (84.0%) and machine (68.0%) was found to be easy for most of the rice farmers in the study area. Notwithstanding, 22.0% of the rice farmers indicated restriction to machine, while 10.0% had easy access to machine.

Table 3: Percentage distribution of respondents based on the degree of access to inputs

S/N	Source	Very easy	Easy	Restricted
1	Seed	20.0	80.0	20.0
2	Fertilizer	0.0	0.0	100.0
3	Herbicides	0.0	0.0	100.0
4	Labour	0.0	100.0	0.0
5	Land		84.0	16.0
6	Machine	10.0	68.0	22.0

Marketing channels used

The various marketing channels utilized by rice farmers and the frequency at which they use each channel to market their produce is presented in Table 4. Findings from this study reveal that majority of the respondents always sold their rice on farm, while none of them ever sold their rice via farmers' marketing cooperative. The categories of buyers that patronized rice farmers on regular basis in the study area were wholesalers (78.0%) and consumers (76.0%). It was found that majority of the rice farmers (94.0%) sometimes sell to retailers but not on a regular basis. This is believed to increase their profit margin as the nearer one gets to the final consumer the greater the profit one enjoys.

Table 4: Percentage distribution of respondents based on marketing channels used

S/N	Marketing channels	Always	Sometimes	Never
1	On farm	88.0	6.0	6.0
2	Neighbouring markets	10.0	88.0	2.0
3	Farmers' marketing cooperative	0.0	0.0	100.0
4	Wholesalers	78.0	2.0	20.0
5	Retailers	0.0	94.0	6.0
6	Consumers	76.0	12.0	12.0

Constraints encountered in rice production production constraints

Table 4 presents the various production constraints rice farmers encountered and their corresponding degree of severity. Constraints such as old age of farmers (90.0%), problem of Quelea birds (88.0%), high rate of interest (84.0%) and flood/water logging (74.0%) were found to be very severe among the respondents, while inaccessibility to land (86.0%), lack of credit facilities (84.0%), low soil fertility (84.0%), high cost of inputs (96.0%), use of crude technology (80.0%) and lack of fertilizer (76.0%) were considered as severe production constraints militating against rice enterprise in the study area. This result aligns with report by Sanusi (2014) that high cost of productive inputs such as seeds, fertilizers and other agrochemicals; climatic factors such as flood, soil salinity and erosion, drought and global warming; weeds, pests and diseases problems; and improper

handling/management of soil and water resource are part of the many challenges of rice farming in Nigeria.

Generally, problem of Quelea birds, high rate of interest and old age of farmers ranked 1st, 2nd and 3rd respectively as the most serious production constraints militating against rice production while lack of water (15th) and soil erosion (14th) ranked least among production constraints assessed in this study. Findings from this study reveal the fact that constraint associated with age buttresses the earlier statistics recorded in

the socioeconomic characteristics of the rice farmers where majority were found to be more than 50 years. Thus, majority of the farmers lack the strength and vigour to carry out basic farm operations. The rural-urban drift might be the major reason for this development. Among rice farmers in Ekiti State, Osanyinlusi and Adenegan (2016) report pest (birds and grass cutter) infestations and inadequate funds (in form of credit access) as being foremost constraints limiting rice production in the area.

Table 4: Percentage distribution of respondents based on production constraints encountered in rice production

S/N	Constraints	Not a constraint	Mild	Severe	Very severe	Mean	Rank
1	Lack of credit facilities	0.0	2.0	84.0	14.0	2.12	7th
2	Lack of improved varieties	2.0	50.0	48.0	0.0	1.46	12th
3	Lack of technical services	4.0	60.0	36.0	0.0	1.32	13th
4	Inaccessibility to land	0.0	14.0	86.0	0.0	1.86	11th
5	Lack of labour	2.0	62.0	24.0	12.0	1.46	12th
6	Lack of fertilizer	0.0	10.0	76.0	14.0	2.04	9th
7	Pest and diseases	0.0	14.0	42.0	44.0	2.30	5th
8	use of crude technology	0.0	2.0	80.0	18.0	2.16	6th
9	Problem of Quelea birds	0.0	2.0	10.0	88.0	2.86	1st
10	Flood/water logging	8.0	12.0	6.0	74.0	2.46	4th
11	Lack of water	96.0	2.0	2.0	0.0	0.06	15th
12	High cost of inputs	4.0	0.0	80.0	16.0	2.08	8th
13	High rate of interest	0.0	0.0	16.0	84.0	2.84	2nd
14	Low soil fertility	4.0	8.0	84.0	4.0	1.96	10th
15	Soil erosion	76.0	10.0	8.0	6.0	0.44	14th
16	Old age of farmers	6.0	2.0	2.0	90.0	2.76	3rd

Processing constraints

The result in Table 5 presents the processing constraints associated with rice production in the study area. Complexity of processing equipment (77.0%) and use of crude technology (74.0%) were found to be mild constraints among the respondents, while high cost of processing equipment (89.0%) and inefficient processing technique (69.0%) were considered as severe constraints. However, the major constraint to rice processing efforts in the study area was the problem of machine repair as it ranked first among

processing constraints assessed in this study with a mean value of 2.82. This constraint was closely followed by high cost of processing equipment ($\bar{X}$=2.05) and low quality of rice produced ($\bar{X}$=2.05) which ranked second among the processing constraints. This result agrees with Sangotegbe *et al.* (2013) who reports that rice farmers are severely constrained due to lack of processing facilities which could have helped in adding value to rice produced thereby improving consumers' acceptability and farmers' income.

Table 5: Percentage distribution of respondents based on processing constraints encountered in rice production

S/N	Constraints	Not a constraint	Mild	Severe	Very severe	Mean	Rank
1	Inefficient processing technique	0.0	21.0	69.0	10.0	1.89	3rd
2	High cost of processing equipment	2.0	0.0	89.0	9.0	2.05	2nd
3	Problem of machine repair	4.0	0.0	6.0	90.0	2.82	1st
4	Complexity of processing equipment	12.0	77.0	11.0	0.0	0.99	5th
5	Problem of damaged grains	10.0	9.0	69.0	2.0	1.53	4th
6	Use of crude technology	25.0	74.0	1.0	0.0	0.76	6th

S/N	Constraints	Not a constraint	Mild	Severe	Very severe	Mean	Rank
7	Low quality of rice produced	0.0	2.0	90.0	8.0	2.06	2nd

Marketing constraints

The various marketing constraints encountered by the respondents and the corresponding degree of severity are shown in Table 6. It was found that marketing of rice is severely constrained by transportation challenges such as bad roads ($\bar{X}$=2.30), poor transportation system ($\bar{X}$=2.16) and poor road network ($\bar{X}$=1.98) which ranked 1st, 2nd and 3rd respectively among the constraints militating against marketing of rice among respondents. Thus, transportation challenges can result into hike in the prices of rice produced. This result is in agreement with Alarima et al., (2011) who found that majority of the rice farmers sampled are constrained by poor road networks coupled with farm topography. According to ATAI (2011), improved transportation is also associated with diffusion of technology, better use of inputs and better prices for farmers. Inefficient market system (90.0%) and lack of market (96.0%) were not regarded as constraints to rice marketing in the study area. This indicates that there is available market for rice produced in the study area and this will also serve as an incentive for farmers to increase production if other constraints militating against rice production in the study area can be brought to the barest minimum.

Table 6: Percentage distribution of respondents based on marketing constraints encountered in rice production

S/N	Constraints	Not a constraint	Mild	Severe	Very severe	Mean	Rank
1	Poor transportation system	0.0	0.0	84	16	2.16	2nd
2	Bad roads	0.0	0.0	70	30	2.30	1st
3	Poor road network	2	2	92	4	1.98	3rd
4	High cost of transportation	16	0.0	60	24	1.92	4th
5	Lack of market	96	2	2	0.0	0.06	9th
6	Inefficient market system	90	2	8	0.0	0.18	8th
7	Poor trade policies	2	6	92	0.0	1.90	5th
8	Poor marketing channels	6	80	14	0.0	1.08	7th
9	Poor packaging	2	26	72	0.0	1.70	6th

Storage constraints

The various constraints militating against rice storage in the study area is presented in Table 7. It was found that problem of pests ($\bar{X}$=2.88) and lack of storage chemicals ($\bar{X}$=2.80) were very severe constraints as they ranked 1st and 2nd, respectively among constraints associated with storage of rice in the study area. It was found that majority of the respondents (92.0%) had space to store rice produced as space for rice storage was not considered as a constraint in the study area. However, the state of storage facility was considered poor by majority (96.0%)of the respondents. High cost of chemicals for rice storage was discovered to be a severe constraint (84.0%) to rice storage efforts among the respondents. Findings from this study show that efforts to ensure availability of rice particularly during the off season become hampered when storage of rice is made impossible owing to array of storage constraints militating against rice production.

Table 7: Percentage distribution of respondents based on storage constraints encountered in rice production

S/N	Constraints	Not a constraint	Mild	Severe	Very severe	Mean	Rank
1	Poor storage facility	0.0	4	94	2	1.98	3rd
2	Problem of pests e.g. weevils, rodents	0.0	0.0	12	88	2.88	1st
3	Lack of storage chemicals	2	0.0	14	84	2.80	2nd
4	High cost of storage chemicals	6	10	82	2	1.78	4th
5	Lack of space	92	2	6	0.0	0.14	5th

Level of constraint encountered by respondents

The level of constraints encountered by respondents along rice production chain is presented in Figure 1. Result shows that the level of constraint is high across the production chains. The highest level of constraint encountered by

respondents along the chain was storage constraints (84.8%) and this was closely followed by production constrains (82.6%). It was found that respondents who were within the low category of marketing constraints (34.8%) were more compare to other production chains (production - 17.4%, Processing - 23.5%, Storage - 15.2%). Generally, the level of constraints encountered by respondents was found to be highamong77.2% of rice farmers in the study area.
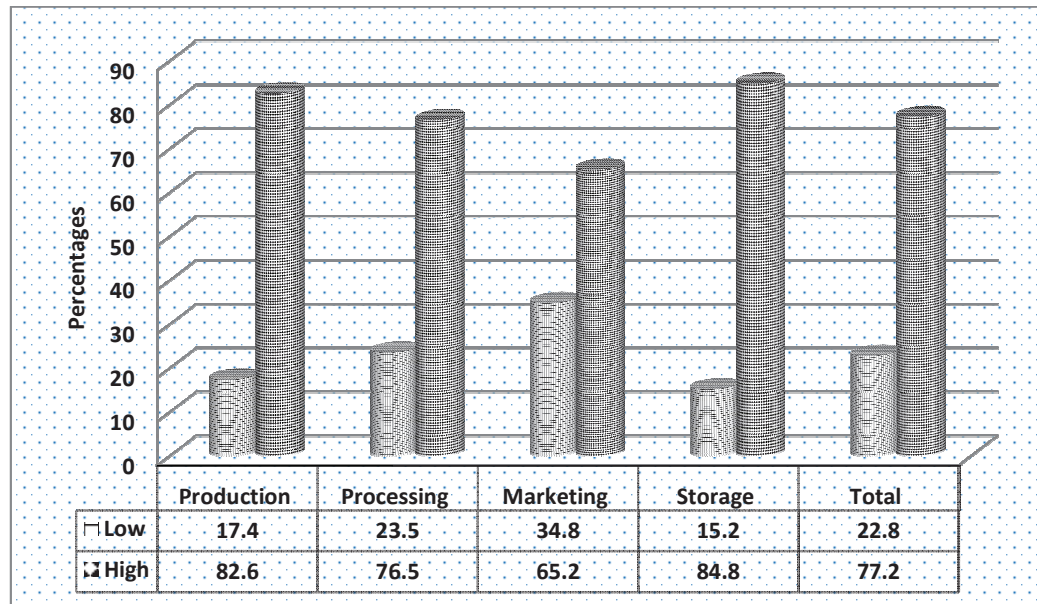

Figure 1: Percentage distribution of level of constraints encountered by rice farmers

Hypotheses testing

Results of test of relationship between respondents' selected personal characteristics and constraint to rice production are shown in Table 8. It was discovered that a significant relationship existed between educational level (χ^2 = -0.746; p<0.05), farm size (r= 0.385; p<0.05) and constraint to rice production. This indicates that education inversely influences constraints encountered by respondents. This implies that those who tend to be more educated experienced lesser constraints compare to those who are not educated. Hence, education of rice farmers is paramount if constraint to rice production is to be combated. The positive relationship between farm size and constraints suggest that those with large farm size among the respondents are more constrained in their enterprises compare with those with small hectares of farm land. However, there was no significant relationship between age, sex, marital status, religion, household size and constraint to rice production. This implies that the aforementioned variables did not significantly determine constraint to rice production among respondents.

Table 8: Test of relationship between respondents' personal characteristics and constraints to rice production

Variables	χ^2 Value	r-value	df	p-value	decision
Age	-	0.054		0.421	Not Significant
Sex	4.492	-	1	0.106	Not Significant
Marital status	1.810	-	2	0.913	Not Significant
Educational level	-0.746	-	4	0.002	Significant
Religion	5.896	-	3	0.207	Not Significant
Household size	-	0.102	-	0.072	Not Significant
Farm size	-	0.385	-	0.025	Significant

* Significant at P<0.05; NS = Not significant; S = significant

Table 8 presents the test of relationship between access to input and constraints to rice production. There was negative significant relationship between access to input and constraints to rice production (r= -0.674, p<0.01). This suggests an inverse relationship between input accessibility and constraints to rice production which implies that access to input significantly

determines rice production. Thus, the more respondents had access to inputs, the lesser the

constraint they encountered in their rice enterprises.

Table 8: Test of relationship between access to input and constraints to rice production

Variables	r-value	p value	Decision
Input accessibility	-0.674	0.000	Significant

CONCLUSION AND RECOMMENDATION

The study concludes that most of the rice farmers are no longer in their productive and active ages. Old age of farmers will not favour mass production of rice that can feed a teeming population of a nation like Nigeria. There is easy access of rice farmers to land and labour, however inputs such as fertilizers and herbicides that can boost production were not readily available. Farmers primarily relied on their own savings for rice production and this might not encourage expansion of land cultivated for rice. This study had revealed array of challenges encountered by rice farmers along the production chain that might limit the commercial value of rice as crop. These challenges include problem of Quelea birds, problem of machine repair, bad roads, lack of storage chemicals and problem of pests such as weevils and rodents. Thus, given the huge tastes and preferences which the Nigerian population has shown in favour of rice as a commodity, it is pertinent to encourage youth in rice farming so that production would be increased and the quest for rice importation overcome. Financial capability of rice farmers need to be enhanced as they mainly rely on personal savings and money gotten from friends and relatives. Inputs such as fertilizers and herbicides should be subsidized by the government and made available to farmers in sufficient quantity so that farmers can be motivated to continue and increase production. Methods and effective insecticides/pesticides that can combat problems of Quelea birds, weevils and rodents should be developed and made available to farmers by government and relevant non-governmental organisations.

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