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Influence of socio-economic characteristics of women farmers on access to improved rice seeds in north-central Nigeria

¹Idu EE, ¹Fadiji TO, ²Osho-Lagunju Bankole*

¹ Department of Agricultural Extension and Rural Sociology, University of Abuja, Nigeria

² National Agricultural Seeds Council, Abuja Nigeria, Nigeria

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Abstract

This research examined the influence of socio-economic attributes on women farmers' access to quality-improved rice seeds in north-central Nigeria. We used primary data for this study. A sample size of three hundred fifty-six (356) smallholder women rice farmers was calculated using a multi-staged random sampling technique. Descriptive statistics and logit model analysis were used to analyze the data. Most of the respondents were married (54.21%). The respondents' average household size, age and farm size were 7.44, 39.69 years, and 1.86 hectares, respectively. The result also reveals that most women (52.81%) farmers had access to credit in the study area. In addition, most (68.54%) of the female farmers were members of cooperative societies. The regression result reveals that access to credit was positive and significant at a 1% probability. It implies that there is a direct relationship between access to credit and access to quality-improved seed. It means that greater access to credit for women farmers will result in greater access to quality, improved seed. Membership in cooperatives was positive and significant at a 5% probability level. This shows that membership in cooperatives positively influences access to improved seeds. Membership in cooperative societies grants farmers access to information, credits, and inputs and allows them to save. The result showed that farm size had a significant influence of 1% on access to improved seed and positively influenced access to improved seed. The result further revealed that extension contact was meaningful at a 5% probability level and positively affected access to improved seed. It shows a direct relationship between extension contact and access to improved seed, which implies that as the women farmers have more contact with extension agents, the level of access to enhanced seed among them increases. The logistic regression result concluded that women farmers' access to improved seeds are significantly influenced by their access to credit, farm size, membership in cooperative societies, and access to extension services. In line with the findings of this study, we recommend that private organizations and the government design quality extension programs focusing on rural women. This will ensure that they are adequately equipped with information on improved seeds, where to access them and the cultural practices they should adopt. Quality seed should be affordable and within reach of women through subsidy schemes and the provision of agricultural credits. Interventions that enhance the knowledge and skills of women farmers should be prioritized while reinforcing their access to supporting and complementary resources, inputs, and services.

Keywords: Seeds, Women, Extension agents, inputs and services

1. Introduction

Agriculture plays an essential role in most non-industrial economies as a major contributor to the country's export earnings and as a source of employment and livelihood. The agricultural division is critical for stimulating growth, reducing poverty, and improving food security in Sub-Saharan Africa, as most of the poor rely on it for survival^[1]. Access to improved seeds is an indispensable factor in the enhancement of agricultural productivity and the progress of any nation. However, most Nigerians rural farmers depend on grains from the previous farming season to cultivate the next cropping season. Such practice will not help tremendously to achieve the needed yield required to bridge the supply-demand gap for rice. Although there are many studies on rice production in Nigeria^[2, 3, 4, 1], studies on access to quality improved rice seeds among rural women farmers in North central Nigeria are scarce.

Furthermore, the relationship between seed access and farmers and their socio-economic characteristics has not

been well documented in the literature in North Central Nigeria. Most existing studies have focused extensively on the impact of adopting improved varieties on income, welfare, and poverty^[5] and are not in North Central. If a farmer does not have access to improved varieties, adoption would be impossible, and there would be no impact. For instance, despite the release of nearly 1,000 enhanced rice varieties in developing countries during 1988–2015, only a relatively small number have been adopted substantially by farmers^[6].

Among different factors, the socio-economic characteristics of the farmers influence their production-decision in agribusiness. Women's contributions to agricultural production in Nigeria have been variously described in the literature^[7]. Still, their role in the production-decision process in agribusiness has not been widely utilized or, at best, remains insignificant. Despite such positive moves by governments with programs and arrangements, there has been inadequate political will and supported promise to

address the needs and interests of women by neighbourhood authorities and governments. Many factors militate against women in their cooperatives in agricultural production, some of which are socio-economic in nature. The task of surmounting such obstacles can be exceptionally overwhelming, despite the fact that women have, to a great extent, succeeded in defeating some of them. Gender inequalities in access to improved seeds limit agricultural productivity and proficiency and, in this manner, undermine the growth plan of the rice subsector. The opportunities for rural women to diversify their incomes are also limited. Many cultures proscribe their working outside the home, and even where this is not the case, rural women are so overburdened with the chores of mere subsistence that the possibilities of their being involved in non-farm income-generating activities are severely curtailed. Nevertheless, women farmers, particularly in rural areas of Nigeria, have always worked, and their labour plays a crucial part in the survival of millions of families. Most rural women are the invisible farmers in Nigeria and form the backbone of rural development.

2. Methodology

2.1 Study Area

The study was carried out in North Central Nigeria. North Central Nigeria consists of seven states situated geographically in the middle belt region of the country, spanning from the west, around the confluence of the River Niger and the River Benue. The area is rich in natural land features and boasts some of Nigeria's most exciting scenery. The states included in the study are the Federal Capital Territory, Benue, and Nasarawa. These states expand roughly from latitude 60 50'N to 90 30'N of the Equator and longitude 70 30'E to 100 00'E of the Prime Meridian. These areas are essentially located in Nigeria's savannah, with its northern edge bordering the Sahel and its southern edge bordering Nigeria's rainforest. The temperature ranges from 20 to 37 degrees Celsius throughout the year, and the annual rainfall ranges from 1000 to 1500 millimetres. The main occupation of the people is predominantly rain-fed agriculture. These areas are rich in the production of yams, rice, beans, cassava, maize, soybeans, sorghum, and millet.

2.2 Method of Data Collection

Primary data was used for this study. Professional enumerators from ADP (Agricultural Development Project),

some of whom grew up in the study area, were retrained and contracted for data collection using well-structured questionnaires.

2.3 Sampling Technique and Sample Size

This study employed a purposive and multi-stage random sampling approach for selecting the respondents. The Federal Capital Territory, Nasarawa, and Benue states were purposefully chosen because of the high level of rice production activities across the rice value chain in the area [6]. Also, based on some common climate and major crop similarities shared between the three locations.

In the first stage, three (3) Area Councils, including Abaji, Kwali, and Gwagwalada, were randomly selected in the Federal Capital Territory. In the second stage, using the raffle-draw ballot box method, three (3) wards were randomly selected in Abaji, Gwagwalada, and Kwali Area Councils. Similarly, in the first stage, Akwanga, Toto, and Nasarawa Eggon Area Councils were randomly chosen from the list of 12 local government areas in the state. In the second stage, three (3) wards were randomly selected out of ten (10) wards in Akwanga (Gwanje, Nunku, and Angwan Zaria); three (3) wards were randomly selected out of five (5) wards in Toto (adadu, biye, dare); and three (3) wards were randomly selected out of fourteen (14) wards in Nasarawa Eggon (Agunji, Aloce/ginda, and Alogani).

Furthermore, in the first stage, three (3) local government areas, including Buruku, Gboko, and Apa, were randomly selected in Benue state. In the second stage, three (3) wards were randomly selected in each local Government Area Council, respectively, using the raffle-draw ballot box method. Finally, from equation (3.1), proportionate-random sampling was used to select a total sample size of 356 smallholder women rice farmers from a total sample frame of 3,243 rice farmers, as shown in Table 3.1. The study used [8] for estimating the sample size.

$$n = \frac{N}{1 + N(e^2)} = 356 \dots \dots \dots (3.1)$$

Where,
 n = Sample Size (Units)
 N= Sample Frame/Population size (Units)
 e = Level of Precision (5%)

Table 1: Sampling Matrix and Sample Size of the Sampled Respondents in the Study Areas

State	LGAs'	Wards	Sample Frame	Proportion	Sample Size
FCT	Abaji	Yaba	116	0.036	13
		Ebaji	108	0.033	12
		Pandaji	125	0.039	14
	Kwali	Kilankwa	148	0.046	16
		Yangoji	101	0.031	11
		Wako	121	0.037	13
	Gwagwalada	Paiko	146	0.045	16
		Gwako	115	0.035	13
		Dukpa	107	0.033	12
Nassarawa	Akwanga	gwande	118	0.036	13
		nunku	105	0.032	12
		Angwan Zaria	127	0.039	14

	Toto	adadu	115	0.035	13
		biye	124	0.038	14
		dare	147	0.045	16
	Nassarawa Eggon	agunji	127	0.039	14
		aloce	131	0.040	14
		alogani	110	0.034	12
Benue	Apa	Ugboko	111	0.034	12
		Oiji	131	0.040	14
		Ojantele	109	0.034	12
	Buruku	Shorov	110	0.034	12
		Etulo	108	0.033	12
		Mbaityough	117	0.036	13
	Gboko	Gboko-East	107	0.033	12
		Gboko-Central	126	0.039	14
		Gboko-South	133	0.041	15
		3243	1	356	

Source: Authors Compilation (2021)

2.4 Method of Data Analysis

The following analytical tools were used to carry out the stated objectives of this study:

2.4.1 Descriptive Statistics

This was used to examine the socio-economic characteristics of farmers in the study area. Descriptive statistics used mean, frequency, and percentages to describe the gender, marital status, household size, age, and level of education, among others, of the women rice farmers in the study area.

2.4.2 Logit Model Analysis

The Logit model following [9] was used to analyze the influence of the socio-economic characteristics of women farmers on access to quality improved rice seeds in the study area. The logit model is stated explicitly as:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \mu_i \dots (1)$$

Where,

Y_i^* = Access to Quality Improved Rice Seeds (1, if $Y^* > 0$; 0, Otherwise)

i = Number of Independent Variables

β_0 = Constant Term

$\beta_1 - \beta_9$ = Regression coefficients

X_1 = Marital Status of the Household Head (1, Married; 0, otherwise)

X_2 = Size of Households (Total Number of Persons)

X_3 = Level of Education of Household Head (in Years)

X_4 = Farm experience (Years)

X_5 = Access to Credit (1, Yes; 0, Otherwise)

X_6 = Member of Cooperative Society (1, Yes; 0, Otherwise)

X_7 = Age of the Farmers (Years)

X_8 = farm Size

X_9 = Number of Contact with Extension Agent

U_i = Error Term

3. Results and Discussion

3.1 Socio-Economic Characteristics of the Respondents

Presented in Table 1 is the result of the socio-economic characteristics of the rural women farmers in the study area.

The result reveals that most (54.21%) respondents were married. Also, 20.22% were widowed, 17.42% were single, and the remaining 8.15% were divorced. This implies that most female farmers in the study area were married. This is in line with [10] that marriage provides the farmer with enough people that help in delivering more labour for their farming activities. The household distribution of the respondents in Table 1 reveals that the majority (53.37%) of the respondents had between 6–10 people living in their household, 29.78% had between 1–5 people in their household, and 14.04% had a household size ranging from 11–15 people. Meanwhile, the average household size of the respondents is 7.44. [11] stated that farming households with many people tend to use more family labour rather than hired labour to carry out their farming activities. This implies that they are likely to spend less on hired labour.

The result in Table 1 further reveals that 48.6% of the respondents were within the age bracket of 31–40 years, 33.99% were within the age of 41–50 years, and 9.55% were between the ages of 21–30. With an average age of 39.69 years, the result implies that most of the respondents are still within their productive, active age, which means they can participate in farming activities effectively. According to [12], young and middle-aged people are the most active in agricultural production activities. Most (37.08%) of the respondents had a farming experience of 0 to 10 years. Another 32.30% of the respondents had farming experience ranging from 21 to 30 years, while about 30.62% had a farming experience of 11 to 20 years. The average year of farming experience is 25.05 years. This aligns with the assertions of [13], who opined that experienced farmers are likely to be able to make sound management decisions on allocating productive resources. Table 1 also shows the respondents' educational qualifications, and it was discovered that the majority (30.34%) of the respondents had only a secondary school education. Also, 29.49% of the respondents had tertiary education, while 22.47% had primary school education. Only 17.7% of them did not have any form of formal education. This result implies that the level of awareness and adoption of innovations among women farmers would be high because of their ability to obtain and comprehend information faster and take calculated risks. A high level of education also allows

farmers to read and write and to be able to process information that can enhance their access to credit.

Table 1 reveals that 45.51% of the respondents had less than 1 hectare of farmland, 32.30% of the respondents had a farm size of 2.00–2.99 hectares, and 22.19% of the respondents had a farm size of 1.00–1.99 hectares. However, their average farm size was 1.86 hectares. The result for the income of the respondents revealed that the majority (57.58%) of the respondents had less than N400,000 in annual revenue, while 42.42% had N400,001 to N800,000. The average income of the respondents was N759,153.07. As stated by ^[14], most farmers engage in subsistence farming rather than commercial farming, which is the reason for their low income. The result also reveals that most (52.81%) women farmers had access to credit in the study area. If provided under proper conditions, agricultural credit

can give agricultural development rapid growth by ensuring that the farmers can obtain relevant farm inputs. Also, Table 1 shows that most (55.34%) respondents did not have access to extension services. Extension services refer to different training and advisory services offered by extension officers. These services help farmers better equipped with adequate knowledge to participate more actively in production activities. Quality extension service is a major determinant of farmers' participation in agricultural activities ^[15]. The result further reveals that most (68.54%) of the women farmers were members of cooperative societies. According to ^[16], membership in cooperative societies helps promote participation in agricultural production as it grants farmers the opportunity to enjoy privileges exclusive to group members.

Table 1: Socio-Economic Characteristics of the Respondents

Socio Economic Variables	Frequency (N=356)	Percentage (%)	Mean
Marital status			
Single	62	17.42	
Married	193	54.21	
Widowed	72	20.22	
Divorced	29	8.15	
Household size			
1-5	106	29.78	
6-10	190	53.37	
11-15	50	14.04	7.44
16-20	8	2.25	
21 or more	2	0.56	
Age (years)			
20-30	34	9.55	
31-40	173	48.60	
41-50	121	33.99	39.69
51 and above	28	7.87	
Farming experience (years)			
0-10	132	37.08	
11-20	109	30.62	
21-30	115	32.30	25.05
Educational Qualification			
Non-formal education	63	17.70	
Primary	80	22.47	
Secondary	108	30.34	
Tertiary education	105	29.49	
Farm size (hectares)			
0.1-0.99	162	45.51	
1.00-1.99	79	22.19	1.86
2.00-2.99	115	32.30	
Income (N)			
Below 400000	205	57.58	
400001-800000	151	42.42	759153.07
Access to credit			
No	168	47.19	
Yes	188	52.81	
Access to Extension Services			
No	197	55.34	
Yes	159	44.66	
Membership of Cooperatives			
No	112	31.46	
Yes	244	68.54	
Total	356	100	

Computed from Field Data, 2021

3.2 Influence of Socio-economic Characteristics of Women Farmers on Access to Improved Rice Seeds in the Study Area

Table 2 shows the result of the logistic regression analysis on the effect of socio-economic characteristics of women farmers on their access to improved seeds in the study area. The result shows that pseudo-R² has a value of 0.139. The Chi-square value is 67.617 and significant at 1%. The result showed that access to credit and farm size were meaningful at 1%, while membership of cooperatives and extension contact were significant at a 5% probability level. The regression result reveals that access to credit was positive and significant at a 1% probability. This shows that there is a direct relationship between access to credit and access to quality-improved seed. It implies that greater access to credit for women farmers will result in greater access to quality improved seed. Access to credit makes it possible for farmers to buy productive inputs like improved seeds. It agrees with the findings of [16], which stated that access to credit was a significant factor in determining the adoption of new rice technology among small-scale farmers. Membership in cooperatives was positive and significant at a 5% probability level. This shows that membership in cooperatives positively influences access to improved seeds. Membership in cooperative societies grants farmers access to information, credits, and inputs and allows them to save. This agrees with the findings of [16], who found that membership in cooperative societies positively influences farmers' access to farm inputs. The result showed that farm

size had a significant influence of 1% on access to improved seed and positively influenced access to improved seed. This implies that access to improved seeds increases with farm size. This finding suggests that farmers with large farm sizes will likely have access to improved seeds because they will have more land to cultivate. This result agrees with the finding of [10], who reported that farm size was positive and had a significant relationship with participation in agricultural activities, which means that an increase in the size of the farm would require the use of more productive resources like an improved seed. The result further revealed that extension contact was significant at a 5% probability level and positively affected access to improved seed. This shows a direct relationship between extension contact and access to improved seed, which implies that as the women farmers have more contact with extension agents, the level of access to enhanced seed among them increases. This shows that the quality of extension services available to women farmers in the study area influences their access to improved seeds. This underlines the importance of training and advisory services provided by extension agents because of their role in delivering vital agricultural information and training to farmers. Farmers exposed to more knowledge and training will be better equipped to access production inputs. This agrees with Akpan *et al.* (2015), who found that extension service was a significant determinant of farmers' access to agricultural inputs.

Table 2: Influence of Socio-economic Characteristics of Women Farmers on their Access to Quality Improved Rice Seeds in the Study Area

Factors	Coefficients	Standard Error	t-value
Marital Status (Dummy)	-0.111	.153	-0.72
Household Size (Number)	-0.007	.035	-0.21
Level of Education (Years)	0.047	.032	1.49
Farming Experience (Years)	-0.004	.013	-0.32
Access to Credit (Dummy)	0.69***	.237	2.91
Member of Cooperatives (Dummy)	0.668**	.287	2.33
Age of Farmer (Years)	-0.023	.017	-1.30
Farm Size (Hectare)	0.77***	.142	5.43
Extension Contact (Dummy)	0.613**	.289	2.12
Constant	-2.691	.977	-2.75
Pseudo R-squared	0.139		
Chi-square	67.617		

*** $P < 0.01$, ** $P < 0.05$, and * $p < 0.1$

Computed from Field Data, 2021

4. Conclusion and recommendations

The study was conducted to determine the level of access of women farmers to quality-improved rice seeds. From the result of the logistic regression, it was concluded that women farmers' access to improved seeds is significantly influenced by their access to credit, farm size, membership in cooperative societies, and access to extension services. In line with the findings of this study, the following recommendations were made: Quality extension programmes which focus on rural women should be designed by the government and other private organizations involved in providing extension services. It will ensure that they are adequately equipped with information on improved seeds, where to access them and the cultural practices they should adopt. Also, quality seed should be affordable and within reach of women through subsidy schemes and the

provision of agricultural credits. Interventions that enhance the knowledge and skills of women farmers should be prioritized while reinforcing their access to supporting and complementary resources, inputs and services.

References

1. Peter DO, Olohunbebe SA, Rahji MAY. Profitability and Technical Efficiency of Rice Production in Abuja, Nigeria. *Nigerian Journal of Scientific Research*. 2020;19(1):21-27.
2. Afolabi CA, Obayelu AE, Agbonlahor MU, Lawal-Adebawale OA. Socio-economic analysis of rice farmers and effects of group formation on rice production in Ekiti and Ogun States of South-West Nigeria. *Journal of Agricultural Science*. 2012, 4(4).
3. Bello M, Salau ES, Ezra L. Analysis of factors

- influencing in continuance of technology adoption: The situation with some Nigerian farmers. *Sustainable Agricultural Research*. 2012;1:292-300.
4. Bwala, Madu Ali, John, Aniobi. Profitability analysis of paddy production: A case of agricultural zone 1, Niger State Nigeria. *Journal of the Bangladesh Agricultural University*. 2018;16:88. 10.3329/jbau.v16i1.36486.
 5. Dontop-Nguezet PM, Diagne A, Okuruwa VO, Ojehomon V. Impact of improved rice technology on income and poverty among rice farming household in Nigeria: A local Average treatment effect (LATE) approach. Contributed paper prepared for the 25th conference of the centre for the studies of African economies (CASAE) 20-22nd March, 2011. St Catherine College, University of Oxford, UK; c2011.
 6. Adenuga Adewale, Omotesho O, Ojehomon VET, Diagne A, Ayinde Opeyemi, Arouna Aminou. Adoption of Improved Rice Varieties and its Impact on Multi-Dimensional Poverty of Rice Farming Households in Nigeria. *Applied Tropical Agriculture*. 2016;21:24-32.
 7. Oyinbo O, Chamberlin J, Vanlauwe B, Vranken L, Kamara YA, Craufurd P. Farmers' preferences for high-input agriculture supported by site-specific extension services: Evidence from a choice experiment in Nigeria. *Agricultural systems*. 2019;173:12-26. <https://doi.org/10.1016/j.agsy.2019.02.003>,
 8. Yamane. *Statistics, An Introductory Analysis*, 2nd ed., New York: Harper and Row, 1967.
 9. Oyedele OJ. *Economic Analysis of Irrigated Rice Production in Kura LGA of Kano State*, M.Sc dissertation, submitted to Department of Agricultural Economics and Rural Sociology, Faculty of Agriculture, ABU, Zaria, 2016.
 10. Mustapha SB, Undiandeye UC, Sanusi AM, Bakari S. Analysis of adoption of improved rice production technologies in Jeer local government area of Borno state, Nigeria", *International Journal of Development and Sustainability*. 2012;1(3):1112-1120.
 11. Saliu JO, Ibrahim MK, Eniojukan FO. Socio economic Determinants of Improved Rice Technologies' Adoption among Small Scale Farmers in Kogi State, Nigeria. *Econ. Organ*. 2016;13(2):217-232.
 12. Nuhu HS, Donye AO, Bawa DB. Barriers to women participation in agricultural development in Bauchi Local Government area of Bauchi State, Nigeria. *Agriculture and Biology Journal of North America*, 2014;5(4):166-174.
 13. Galadima M. Impact of IFAD Community Based Agriculture and Rural Development Programme on Rural Livelihood in Yobe State, Nigeria. Unpublished M.Sc. Thesis. Department of Agricultural Economics and Rural Sociology. Ahmadu Bello University Zaria, Nigeria. 2014.
 14. Chekene MB, Chancellor TSB. Factors Affecting the Adoption of Improved Rice Varieties in Borno State, Nigeria. *Journal of Agricultural Extension*. 2015;9(2):21-33.
 15. Akpan SB, Patrick VI, James US, Agom DI. Determinants of decision and participation of rural youth in agricultural production: A Case study of Youth in Southern Region of Nigeria. *Research Journal of Agricultural Science*. 2015;7(43):35-48.
 16. Akpan SB. Encouraging Youth Involvement in Agricultural Production and Processing in Nigeria: International Food Policy Research Institute, Washington, D.C. IFPRI Policy Note No. 29. 2010.
 17. Alarima CI, Kolawole A, Sodiya CI, Oladele OI, Masunaga T, Wakatsuki T. Factors affecting the adoption of sawah technology system of rice production in Nigeria. *Journal of Food, Agriculture and Environment*. 2011;9(3-4):177-183.