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Determinants of Land Holding Size among Rice Farmers in Southeast, Nigeria

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Abstract

This study identified determinants of land holding size of rice farmers in Anambra state, southeast Nigeria. A multistage sampling technique was used in sample selection. Six autonomous communities were chosen purposively based on the consideration of rice farming activities in these rural communities. The sample frame was 182 rice farmers. From this sample frame, twenty rice farmers were randomly selected from 6 rice farming communities giving a sample size of 120 but 99 were valid. Data were collected with structured questionnaire from 120 randomly selected rice farmers. Data were collected on the socio- economic variables, land sizes, land amendment practices.. Data were analysed using descriptive statistics; ordinary least squares multiple regression techniques. The results showed that rice farmers in the study area were predominantly male (78.79%) with a mean age of 44.2years and household size of 8persons.Their major method of land acquisition is through communal followed by inheritance, lease and purchase. The average land size cultivated on was 1.66ha.The multiple regression analysis showed that factors such as sex, farming experience, method of land acquisition, annual off farm income and lease price of rice farmers influenced their landholding size. It is therefore concluded that with government intervention farmers can have access to increased land sizes which will invariably improve technology use and the level of profit would increase.

Keywords: Land ownership, Amendment, Practices, Size, Rice, Determinants

Contents

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1. Introduction

Although rice grows well in all the six geo-political zones of Nigeria, the demand for polished long grain, stone free and odorless rice by the urban dwellers has fueled the demand for imported rice. Total demand for rice in Nigeria is put at about 5million MT a year out which about 3.2 million MT are produced locally. Erenstein, et al. [1] observed that the demand and supply gap in rice production is widening, resulting in huge import bill on rice. The high cost of importation in recent years has highlighted the desire by the government to encourage import substitution by encouraging increased local production. Locally produced rice at present is uncompetitive in the market because its value chain is fragmented and cannot offer a standard. It is fraught with poor quality-presence of extraneous materials such as stones and debris. Most farmers in Nigeria keep on operating patches of small holdings; as a result rice production is mostly dominated by small holder producers who employ traditional practices and primitive technology resulting to a negligible quantity in production and supply of the commodity which result to a meager income which could not provide decent existence for farm family. Secondly because all operations are manual with limited farm sizes, cost of production is also high. This is in spite of the fact that Nigeria has very favorable ecologies for rain fed lowland, irrigated lowland as well as upland rice production. Total potential land for irrigated rice production is estimated at 1.6 million hectares out of which only 47, 798ha is available.

There had been reported decrease in farm size and consequently fallow length which has adversely affected the resource base due to increasing population pressure on the available land [2]. In the absence of sound management practices or the economic use of fertilizer and other additives, declining fallow periods results to accelerated periods of leaching of nutrients, increased weed population, erosion and decreased moisture retention [3, 4]. Manure, whether organic or inorganic helps to enhance plant development. The major purpose of manure or fertilizer application is to improve soil fertility and increase yield of crops. In crop production, proper and adequate plant nutrients are required for an enhanced crop establishment, growth and yield. Nakkiran and Karthikeyan [5] opined that fragmentation of scattered pieces of land contributes to the difficulties of getting effective soil conservation measures implemented and increases the labour and time required in agriculture. However, crop production can be influenced by the source of nutrient involved in its production [6]. Reduced portion of arable land have led to the abandonment of the traditional methods of land use and over- exploitation of the land have resulted to land degradation. It means that if over- crowding on the arable land leads to less efficient methods of production, then food production would actually decrease as population increase. For instance, Nweke [7] pointed out that average holding on farm land is less than 1.5 hectares per family in addition to another 0.2 hectares of compound land. This implies that the farmers may have small plots of land scattered some distance from his home. Even the size of holdings and of individual plots according to Eboh [8] is further reduced by fragmentation due to division of farm land among heirs. Therefore, some scholars [2, 9, 10] are of the view that farm size is to a large extent a reflection of pressure on land. This work is set to achieve the following objectives

-analyse the socio-economic characteristics of the farmers

-isolate the determining factors to land size holding

-determine the land amendment practice

2. Methodology

The southeast is made up of five states; Anambra, Imo, Abia, Ebonyi and Enugu and rice is being produced in all these states. The zone is located at the tropical rain forest with thick vegetation. Demographically the zone has a population of sixteen million three hundred and eighty on thousand seven hundred and twenty nine (16,381,729) which is approximately 12% of the entire population of Nigeria [11].

The multistage sampling technique was used in sample selection. This was used in order to enable the researcher capture a significant position of the characteristics of the farmers at different stages and to ensure a good spread of the data. In the first stage, two states were randomly selected and Three local government areas and six autonomous communities were purposively selected (3 each) from the twenty- two autonomous communities on the consideration of rice farming activities in these rural communities. Ten informants from each of the six sampled communities were selected to aid generation of the list of rice farmers. The sampling frame was 182 (list of rice farmers in each village within the selected autonomous rural communities involve in rice farmers). From this sampling frame, twenty rice farmers were randomly selected giving a sample size of 120. Data were collected from primary and secondary information sources. The study made use of a well-structured questionnaire and journals, bulletins and textbooks. Twenty one questionnaires were invalid and just 99 questionnaires were used for further analysis. Data were analyzed using descriptive statistics such as frequency, percentages and mean, and multiple regression analysis.

A multiple linear regression model was employed and is expressed as

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, e)$ ……(1)

Where,

Y = land holding size in hectares

X_1 = sex (Dummy, 1 for male; 0 for female).

X_2 = age of farmer (years).

X_3 = marital status (Dummy 1 for married; 0 for otherwise)

X_4 = household size (number of persons).

X_5 = level of education (years)

X_6 = farming experience (years).

X_7 = method of land acquisition (Dummy, 1 for communal; 0 for otherwise).

X_8 = off - farm income of farmer per annum (Naira).

X_9 = lease price per hectare (Naira).

e = error term.

Four functional forms were fitted to the data. These include the linear, semi – log, double- log and the exponential functions. The function that gives the best fit was selected based on the magnitude of the coefficient of the multiple determination (R^2) and the size and signs of the estimated coefficients and the statistical significance of the parameter estimates.

3. Results and Discussion

Table 1 showed that 78.78% of rice farmers were male while 21.21% were female. This shows that majority of the respondents were male. This fact goes a long way to show the domination of the male sex in rice farming due to the nature of the job which is mostly strenuous for their female counterpart and also the pattern of land ownership in the study area. This agrees with the findings of Olaleye [12] that small scale farming are being carried out mostly by males, while the females involve in light farm operations such as harvesting, processing and marketing.

The mean household size was 8 persons. This shows that most of the respondents have a larger family size that assists them in their farming activities; also it will continue to reduce land area available for individual farmers in the future. This disagrees with the findings of Ogungbile and Olukosi [13] that in Nigeria the average family size is about 6- 7 persons per family. The method of land acquisition was mainly communalThe mean level of education of rice farmers is 8.1 years. This implies that most of the farmers obtained at least primary education. This feature makes them capable of understanding and adopting available innovations that encourages rice production. The mean level of experience of rice farmers was 7.95 years. This implies that most of the farmers interviewed have been in the business for a reasonable number of years. This period would have exposed them to various challenges associated with rice production and therefore would have found adaptive strategies to those challenges hence better productivity. Rice farmers acquire land through communal land tenure system. The mean farm size available to each farmer was 1.66 hectares. It could be deduced that large expanse of land was not available to majority of the farmers; thus extremely limiting commercialization and productivity in agriculture in the study area. The mean lease price per hectare was ₦12,676 which was high considering that farmers in the rural areas are pro-poor.

Table-1. Socio-economic characteristics of the respondents n=99

Characteristics	Frequency	Percentage
Sex		
Male	78	78.79
Female	21	21.21
Age (Mean=44.2years)		
30-39	48	48.48
40-49	22	22.22
50-59	13	13.14
60-69	16	16.16
Marital Status		
Married	93	93.94
Single	6	6.06
Household size (Mean-8persons)		
2-7	45	45.45
8-13	50	50.51
14-19	4	4.04
Method of Land acquisition		
Communal	56	56.57
Inherited	32	32-23
Lease	8	8.08
Purchase	3	3.03
Farming Exp. (Mean-7.95years)		
1-5	31	31.31
6-10	64	64.65
11-15	14	14.14
Educational attainment		
(Mean=8.1yrs)	29	29.29
1-6	55	55.56
7-12	15	15.15
13-18		
Lease Price/ ha (Mean=N12,676)	34	34.34
10.000- 15,000	65	65.66
16,000-20,000		
Off farm income sources	62	62.63
Trading	22	22.22
Artisan	6	6.06
Hairdressing	9	9.09
Civil Servant		
Land holding size (Ha)	1	1.01
(Mean=1.66ha)	26	26.26
0.5 – 0.9	57	57.58
1.0 – 1.4	10	10.10
1.5 – 1.9	5	5.05
2.0 – 2.4		
2.5 – 2.9		
Total	99	100

Source: Field survey, 2013

Isolate the Factors Influencing Landholding Size in the Study Area

Table-2. Factors Influencing Land Holding Size in the Area

Explanatory Variable	**Linear Form**	**Semi-log Form**	**Double-log Form**	**Exponential Form**
Sex(X_1)	0.623993 (1.799542)*	0.94809 (1.625663)	0.189584 (1.921738)*	0.23917 (1.946059)*
Age (X_2)	-0.00558 (-0.36003)	-0.92589 (-0.81704)	0.065396 (0.34115)	-0.00056 (-0.10109)
Marital Status(X_3)	-0.11319 (-0.35323)	-1.05554 (-1.61889)	-0.00038 (-0.00342)	0.15808 (1.391828)
Household Size (X_4)	-0.04064 (-0.74812)	0.45164 (0.930798)	-0.04402 (-0.5363)	-0.02101 (-1.09114)
Levelof Education (X_5)	0.017495 (0.669746)	-0.09631 (-0.35798)	0.05746 (1.262645)	0.014442 (1.559893)
Farming Experience(X_6)	0.041813 (2.591611)**	1.03859 (2.059167)**	0.066407 (0.778349)	0.003393 (0.593372)
Method of Land Acquisition(X_7)	-1.21663 (-3.01443)***	-1.40679 (1.82925)*	-0.38953 (-2.99432)***	-0.59006 (-4.12489)***
Off- farm Income of Farmer (X_8)	0.00000331 (2.646787)**	2.222085 (3.303207)***	0.322954 (2.838112)***	0.000000445 (1.002659)
Lease price (X_9)	0.000518 (8.890965)***	2.126741 (4.179953)***	0.4745 (5.513241)***	0.00000736 (3.564822)***
Constant	0.791164	-39.3209	-7.06033	0.718748
R^2	0.969815	0.913886	0.940657	0.908676
F- Value	142.7958	47.16693	70.44972	44.22252
Degree of Freedom	90	90	90	90
No of Observation(n)	99	99	99	99

Source,FieldSurvey,2013
**Significantat5%level
*Significantat10%level
***Significantat1%level.

Figures in parenthesis are t-ratios.

Table 2 shows that four functional forms of the multiple regression analysis models were tried, out of the four functional forms estimated, the linear functional form provided the best fit and hence chosen as the lead equation. This choice was based on the premise that it has the highest number of t-values that were statistically significant at 1%, 5% and 10% level. It also showed a relatively higher $R^2$and F-value of 0.97 and 142.8 respectively. The R^2 value implies that 97% of the variation in the farmers land holding size is explained by the variations in the independent variables included in the model, while the remaining 3% of variation in farmers land holding size is explained by other variables not included in the model. The F-value of 142.8 shows that the proportion of the explained variation on the dependent variables is statistically significant at 0.01 levels which implies that the model is adequate for use for further analysis. The result showed that factors such as Sex(X_1), Farming Experience(X_6), Method of Land Acquisition(X_7), Income of Farmers(X_8) and Lease Price(X_9) significantly influence the land holding size in the study area.

Sex(X_1) which showed a positive relationship with land holding size and significant at 10% level of probability. This could be that the workload involved in rice production makes men in the enterprise more productive than the women; this therefore implies that landholding size is increased as the productive sex increase.

Age(X2) of farmers showed an inverse relationship with landholding size but not significant. This implies that as the age of rice farmers increases the landholding size decreases.

Marital status(X3) showed an inverse relationship with landholding size but not significant. This implies that marital status of respondents in the study does not influence landholding size.

Household size(X4) also showed an inverse relationship with landholding size but not significant. This implies that as the household size increases the landholding size decreased. This may be due to sharing of farmlands among households as a result each individual would be entitled to small portion of land to cultivate.

Level of education(X5) of farmers showed a direct relationship with landholding size but not significant. This implies that as the farmers level of education increased the landholding size increase as well.

Farming Experience(X6) showed a positive relationship with landholding size and significant at 5% level of probability. This implies that as the years of farming experience of respondents increased the land holding size also increased because farmers with highest number of years of experience in farming will have good skill and better approaches to farming operations and would want to obtain more farmlands inorder to expand production which leads to increased productivity.

Method of land acquisition(X7) showed a negative relationship with landholding size and significant at 1% level of probability. This implies that as method of land acquisition decreases the landholding size decreases. The decrease in land acquisition was due to the prevalence of communal landholding system in the area resulting to fragmentation of land among members of the community, this is so because the land belongs to the entire community, as a result no member of the community is permitted to use the land without permission from leaders of the community and individuals are given small portion of land on which they could cultivate.

Income of farmers(X8) showed a positive relationship with landholding size and significant at 5% level of probability. This implies that as the income of farmers increased the landholding size also increase. This implies that farmers with higher equity is capable of purchasing or obtaining larger size of farm in order to expand production and also enjoy the economies of scale thereby leading to higher productivity.

Lease price(X9) showed a positive relationship and significant at 1% probability. This implies that as landholding size increases the lease price increased. This relationship supports the law of supply which says that the higher the price the higher the quantity supplied.

Examine the soil amendments practices adopted by the farmers to improve production.

Table-3. Frequency distribution of land amendment practices adopted by the rice farmers

Land/SoilAmendment Practices	*Frequency	Percentage	
Fertilizers	95	95.96	
Pesticides	58	58.58	
Herbicides	30	30,30	
Insecticides	15	15.15	
Irrigation System	4	4.04	
Increased fallow length	20	20.20	
Other amendment practices	31	31.31	

Source: Computed from Field Survey, 2013.*Multiple responses were recorded

The table showed that 95.96% used fertilizers, 58.58% used pesticides, 30.30% used insecticides, 15.15% used the irrigation system, 404% practiced increased fallow length, 20.20% increased fallow length while 31.31% did other soil amendment practices. This implies that the soil amendment practices mostly done by farmers are the use of fertilizers and other agro- chemicals. Also, farmers do more of the land amendment practices as these practices helps in the improvement and sustainability of the farmers' physical production and hence increased productivity.

4. Conclusion

This study has brought to the open that the land holding size of the rice farmers is relatively small and can discourage the practice of rice farming. There is need for the enhancement of Land holding size so that rice farmers would optimize resources used in rice production.

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