Review Paper

Determinants of Farmland Value in Imo State, Nigeria.

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ARTICLE INFORMATION	ABSTRACT
	The study analyzed the determinants of farmland value in Imo State, Nigeria. The specific objectives were to examine the socio-economic characteristics of the food crop farmers, examine the methods of land acquisitions, and determine the factors influencing farmland value and estimate the value of farmland. Primary data were collected using a set of structured questionnaires from 180 respondents who were selected through purposive and random sampling techniques. Data were analyzed using descriptive statistics, econometric tools and hedonic price model. The results of the socio- economic characteristics of the farmers revealed a mean age of 40.8 years, an average of 8.83 years of formal education, a mean of 8.86 years of farming experience. The mean farm size was 1.086 hectare and inheritance as the method of land acquisition. The results of the Ordinary Least Squares multiple regression model for factors influencing farmland value showed that location and purpose of use were significant at($P< 0.05$), access to road and returns on land were significant at ($p<0.1$) and distance, community levy and duration of tenancy were significant factors for farmland value at ($P<0.01$). The result further showed that the average farmland value was ₦53,975.91. Reduction in the annual rental value of farmland through the removal of community levy in the study area.

Introduction

Land is a factor of production and a critical input in agricultural production (Raufu, 2010). The criticality is imposed by its availability, accessibility, quality and quantity. In Nigeria, the quality factor stands out as major determinants of land productivity. Land is important natural resources, used as an input factor in economic activities, such as agricultural, forestry, industrial and commercial uses. The economic allocation of land depends on return from these alternative uses, (Salman, K., Ghaffar, A., Syed, A.S., Abbas, U.J., Dawood, J., and Fayaz, M.,2016). According to Koomen and Buurman(2000), land has special characteristics compared to other inputs: its supply is fixed, has a fixed location, and its use affects the use and value of surrounding parcels.

Land has been described as all forms of natural resources with which a particular country has been endowed with, which are used in production (Onyebinama, 2000). It refers to those resources over which people have the power of disposal and which may be used to yield income. Land also supports other factors of production according to (Anyanwuocha, 2011).As land is the most basic means of production in the agribusiness sector, the quality of the land has a sizeable influence on its price, several factors can be used to evaluate the influence of land quality on its price(Kostov, 2009).

Farmland value is the price of a cultivated farm land per hectare for production in a voluntary transaction. Land prices are differentiated on the basis of its production attributes in agriculture as well as other activities (Delbecq, B.A., Kuethe, T.H., Borchers, A.M., 2014).An increase in farmland value most likely is driven by a combination of various factors to include, increase agricultural productivity, high commodity production, price, expanding trade and strong demand for non-agricultural land uses (Anderson, 2003). According to (Ehirim, N.C; Osuji, E; Anyanwu, U; Okwara, M., 2017),the value of land is rarely influenced by its demand for constructions, building and urban development, hence, the potential returns of agricultural activities are converted into farmland prices, with other variables reflecting the economics returns to agriculture. Land is mostly influenced by some natural and human factors that account for its development frame work and value. The framework of land conceptualizes the economic and social features of land which leads to its increasing value (Ehirim *et al.*, 2017). Economists have over the years studied the structure of agricultural land values or price in other to understand potential threats posed on land development to agriculture considered to be socially undesirable land use for food crops production (Andrew, J.P, Ruben, N.L and Robert, N.S., 2002). According to Oduwaye (2005), who examined land values in residential neighborhood in metropolitan Lagos, residential segregation exists in Nigeria between lands at different locations. His findings show that there are strong relationships between the residential land and agricultural

land values such as rent, cost, and cost of a plot of land. The outcome of the study showed that infrastructural facilities and economic variables are the major determinants of residential and agricultural land values in residential neighborhood.

Price is the only factor that must be considered when purchasing land, rental price and other factors include location, timing of an expansion and the financial situation of an individual and personal goal of a land owner have room to flex land value (FCC, 2015). In the agricultural sector, before any land is purchased for utilization, the price of the land must be estimated. The determinants of farmland prices are those items that influence the amount of farmland offered to the market and the amount of farmland desired from the market. However, the farmland market is different from the markets for products such as maize, soybeans, fertilizer or even equipment (Brent, A.G., Michael, D.B., Craig, L.D., Christopher, H., and Timothy, G.B., 2010). Over the past years, agricultural farmland have not been characterized by increases in the price of a rental farmland and but until very recently the prices have been on the rise, hence total returns have not witnessed any significant increase that will explain the sudden rise in farmland value. However, unequal distribution of land at different prices and insecure land tenure have affected value of farmland and have also had the most profound effect on the livelihood of farmers as a result of their inability to pay for the allotted size of farmland they desired. However, some land tenure system such as land lease cannot be subjected to improvement during utilization and this eventually affects the values of the farmland.

Moreover, the increasing demand of farmland for building and construction is creating the incessant rise in the values of farmlands. Many farmers have lost farmlands due to high rental or purchasing prices of farmland for agricultural activities. The loss of agricultural land could reduce the domestic food production and could threaten national food security in future (Salman *et.al.*, 2016). Rapid urbanization have led to the loss of cultivated farmland. The continue increase in the construction of the hospitality industries and the establishment of new estates and market places have increasingly affected adversely the value of farmland in Imo State. Many individual farmers who have leased and rented farm lands, and those who have temporary ownership of farmland for agricultural activities have suffered diverse losses as the owners of these lands have without prior information cleared the land and converted them to hotels and residential buildings. This also possesses a threat to agricultural production in the area. In a view to addressing the challenges that lead to the variations in the farmland value decline in the research tends to address the determinants of farmland value. The farmland value as mentioned in this study is the price of farmland be it rental or purchasing price. The board objective of this study was to examine the determinants of farmland value in Imo State Nigeria. The specific objectives were to;

(i) describe the socio-economic characteristics of the farmers in the study area,

(ii) examine the methods of land acquisition in the study area,

(iii) determine the factors influencing the value of farmland and estimate the value of farm land in the study area.

Materials and Methods

Study area

The study was conducted in Imo State of Nigeria. Imo State is located in the Eastern zone of Nigeria. It lies between latitudes $5^0 45^1$N and $6^0 35^1$N of the equator and longitudes $6^0 35^1$E and $7^0 28^1$E of the Greenwich meridian, occupies the area between the lower River Niger and the upper and middle Imo River, bounded on the East by Abia State, on the West by the River Niger and Delta State, and on the North by Anambra State, while River State lies to the South.

Imo State covers an area of about 5,067. 20 km^2, with a population of 3, 934, 899 (National Population Commission, 2006); a current population of about 5,408,800 (NPC, 2016) and population density of about 725km^2 (Ministry of Land Owerri, 2014).The State has three agricultural zones (Orlu, Owerri and Okigwe agricultural zones). These divisions are for administration and extension services and not for any agro-ecological difference. The State has 27 Local Government Areas (Imo Agricultural Development Programme, 2014), and the State experiences an average annual temperature of 28°C, an average relative humidity of 80% average annual rainfall of 1800 to 2500mm and an altitude of about 100m above the sea level (Imo ADP. 2014).

Sampling Method

Random sampling techniques were employed to draw the respondents for the study. The first stage involved random selection of the 2 Agricultural zones of the State. In the second stage, three (3) Local Government Areas each were purposively selected from the agricultural zones(based on the increasing demand of farmland in the area) making a total of nine (6) Local Government Areas used for the study. Also, in the third stage, five (5) communities were randomly selected from the nine (6) selected Local Government Areas making a total of 30 communities used for the study. Furthermore, three (3) villages were selected purposively from the selected communities making a total of 90 villages used for the study. The list of farmers in each of the chosen communities formed the sampling frame. Finally, two (2) farmers each were randomly selected from each of the 90 selected villages; giving a total of 180 farmers used for the study and this formed the sample size. Descriptive statistical tools such as mean and percentages were used to describe the socio-economic characteristics of the farmers and method of farmland acquisition while ordinary least multiple regression models were used to determine the factors influencing farmland value and hedonic price model were used estimate the value of farmland in the study area.

The models are specified as follows:.

The model is specified as follows:

$$LV_i = f\left(X_1, X_2, X_3, X_4, X_5, X_6 X_7, X_8, X_9, X_{10}, X_{11}\right) \dots \qquad \dots..(1)$$

Where;

$LV_i =$ Farmland rental price (₦)
$X_1 =$ Farm size (hectare)
$X_2 =$ Location (1 for Rural and 0 for Urban)
$X_3 =$ Returns from farmland (₦)
$X_4 =$ Types of soil (1 for loamy and 0 for otherwise)
$X_5 =$ Distance (Kilometre)
$X_6 =$ Productivity of farmland
$X_7 =$ Types of Cropping system (1 for mixed and 0 for otherwise)
$X_8 =$ Access to road (1 for Access and 0 for No Access)
$X_9 =$ Purpose of use (1 for agricultural use and 0 for Non-agricultural use)
$X_{10} =$ Community levy (₦)
$X_{11} =$ Duration of tenancy (years).

However, the value of farmland was estimated with hedonic pricing model, which is specified as follows;

$$L_i = \beta_0 + \sum_{i=0}^{n} \beta_1 \bar{X}_1 + \sum_{i=0}^{m} \beta_2 \bar{X}_2 + \sum_{i=0}^{y} \beta_3 \bar{X}_3 + \sum_{i=0}^{z} \beta_4 \bar{X}_4 + \cdots \sum_{i=0}^{u} \beta_n \bar{X}_n \qquad \dots(2)$$

Where:
$L_i =$ Farmland value
$(\beta_1 - \beta_n) =$ estimated parameters,
$(\bar{X}_1 - \bar{X}_n) =$ means of the estimated variables
$\beta_0 =$ Intercept

The values from the lead equation of the regression technique of factors influencing farmland value were used in the hedonic price model to estimate the value of land in the study area.
It was expected at a priori that the coefficient of X_1, X_2, X_5,X_6, X_7, X_8, X_{10},$X_{11} > 0$; X_3,X_4,$X_9 < 0$
The functional forms that were estimated are linear, semi-log, double log and exponential. However, the functional form with the best fit was selected on the statistical significance of the regression coefficients and the magnitude of R^2 (coefficient of determination).

Results and Discussion
Socio-economic Characteristics of the farmers are presented in Table 1

Table 1. Socio-economics Characteristics of the famers.

Age (years)	Frequency	Percentage (%)
20 – 29	37	20.6
30 – 39	41	22.8
40 – 49	68	37.8
50 – 59	20	11.1
60 – 69	14	7.8
Means	40.8	
Marital Status		
Married	106	58.9
\Single	53	29.4
Widow	16	8.9
Widower	5	2.8
Sex		
Male	98	54.4
Female	82	45.6
levels of education		
0 – 6	53	29.4
7 – 13	104	57.8
14 -20	23	12.8
Mean	8.83	
Farming experience		
1 – 5	63	35
6 – 10	67	37.2
11- 15	18	10
16 – 20	20	11.1
21- 25	12	6.7

Mean	8.86	
Farm size		
0.6 – 1.0	104	57.8
1.1 – 1.5	55	30.6
1.6 – 2.0	15	8.3
2.1- 2.5	6	3.3
Mean	1.086	

Source: Field Survey Data, 2019

Table 1 showed mean age of the respondents was about 40.8 years which showed that the farmers were in their active year. According to (Henri-ukoha, A; Anaeto, F.C; Chikezie,C; Ibeagwa, O.B; Ukoha, I.I; Oshaji, I.O and Anyiam , K.H., 2015), farmers in their forties were still active and can produce the needed output. This also agree with the findings (Onubuogu, G.C; Chidebule, S; and Eboh, E.C., 2013) that farmers within the ages of 41 to 50 years were still active and could withstand the stress involved in farm production . Table further showed that 58.9% of the respondents were married. This implies that farming activities in the area are mostly dominated by married people and have contributed greatly in the negotiation of farmland prices and farm activities in the rural areas. This agrees with the findings of Henri – Ukoha *et al.* (2015) who reported that farming in the rural areas are mostly dominated by married people. The results also showed that 54.4% of the respondents were males while 45.6% of respondents were females. This implies that males dominate in farmland valuation than their females' counterpart; this may be attributed to the reasons why women are not involved in any land matters in the communities. More so, Table showed the mean level of education of the respondents was 8.83 years of education. This implies that the respondents apart from indigenous knowledge possessed formal education at the level of primary education to know what are required during farmland valuation. According to Ehirim *et al.* (2017), improved level of education brings about positive changes in knowledge, attitude and skills through research and extension .

The results in Table 1 also showed that the average farm size of the farmers was 1.086 hectares. This implies that the size of farmland determine the price of the farmland.

Table 2 Methods of land acquisition

Methods of Land Acquisition	Frequency	*Percentage(%)
Leasing	76	19.59**
Inheritance	138	35.57**
Purchase	31	9.28
Leasing and Purchase	20	6.70
Inheritance and Purchase	15	3.87
Inheritance, Leasing and Purchase	18	4.64
Leasing and Inheritance	82	21.13**
Total		100

*Source: Field survey Data, 2019. * = multiple responses. ** = major methods of land acquisition.*

Table 2 showed the multiple responses of the respondents on the methods of farmland acquisitions. 35.57% of the respondents acquired their land through inheritance and 21.13% through leasing and inheritance and 19.59% acquired through leasing. This shows that majority of the respondents in the study area acquired farmland through inheritance; this may be the reason why the farmers in the study area did not have enough farmland at their disposals to increase their production capacity. Farmland is directly relate d to food crops production; small farmland will not translate the level of output the farmers in the study area desired. This disagreed with the findings of (Ben-Chendo, G.N; Korie,O.C, Essien, U.A, Uhuegbulem, I.J ,2014).) which posited that the methods of land acquisition in South East Nigeria was mainly communal method but agreed with (Eze, C.C; Okonkwo, S.O, Orebiyi, J.S. and Kadiri, F.A., 2011) in their study of land tenure system, farm size, innovation and agricultural productivity in South East that majority of the people in South East acquired land through inheritance which was not enough for them to go into commercial farming.

Table 3 Factors Influencing Farmland value.

Explanatory variables	Linear function	Exponential function	Semi-log function	Double-log function+
Constant	14553.825	8.597	271453.662	7.228
Farm size	-2939.821	-0.032	1928.012	0.019
	(- 0.472)	(-0.685)	(0.204)	(0.299)
Location	12961.197	0.039	8622.911	0.033
	(2.326)**	(0.937)	(2.008)**	(2.136)**
Return	0.395	1.440E-005	8660.478	0.055
	(0.239)	(0.999)	(1.935)*	(1.880)*
Soil type	-10188.123	-0.117	11264.129	0.007
	(0.919)	(-1.443)	(1.331)	(0.119)
Distance	871.509	0.021	18539.297	0.201

	(4.378)***	(5.099)***	(1.859)*	(2.960)***
Productivity	31.032	0.001	3987.124	0.029
	(0.289)	(0.918)	(0.784)	(0.841)
Type of crop	26269.377	-0.050	6431.246	-0.120
	(1.661)	(-0.380)	(0.445)	(-1.215)
Access to road	43787.929	0 .362	2173.064	0.226
	(1.834)*	(1.981)*	(1.098)	(1.977)*
Purpose of use	-237804.02	-0.379	-52127.129	-0.337
	(-12.719)***	(-2.384)**	(-2.545)***	(-2.479)**
Community Levy	0.210	1.563	-32365.803	0.145
	(1.131)	(1.279)	(-5.510)***	(3.623)***
Duration of Tenancy	425.954	0.33	63278.694	0.772
	(4.378)***	(24.320)***	(15.432)***	(27.674)***
R^2	0.402	0.841	0.665	0.884
R^{-2}	0.386	0.835	0.650	0.879
F- ratio	26.102***	131.240***	45.594***	175.196***

*Source: Field Survey Data, 2019.Values in parentheses are t – ratio   + = lead equation; ***= significant at 1%, **= significant at 5%, *= significant at 10%*

Table 3 showed that the double log functional form provided the lead equation on the basis of having the highest value of coefficient of multiple determination (R^2), highest numbers of significant variables, highest F-value and in conformity with a priori expectations. The value of coefficient of multiple determinations (R^2) was 0.884, which implies that 88.4% of the variation of farmland value in the study area was accounted for by the explanatory variables in the model. Variables such as location, return, distance, access to road, purpose of use, community levy and duration of tenancy were significant at 5%, 10% and 1% respectively, while variables such as farm size, type of soil, productivity, and type of crop were not significant at 5% , 10% and 1% respectively.

The coefficient of location was significant at five percent and positively related to farmland value in the study area. This implies that location positively affects farmland value; that is farmland value in the rural areas is lower than the value of farmland in the urban areas. According to (Oluyole, K.A; Oni, A.O; Omonona, B.I and Adenega, K.O., 2009), in his research, he stated that location is a positive influence on farmland value, land in the urban areas are highly valued than the rural land. The coefficient of returns was significant at 10% percent and was positively related to farmland value. This implies that any increase in returns in terms of higher output or yield from the land increases farmland value. Farmland that generated high returns to investment will experience increased value. The productive value of land is determined by the land's ability to generate a high financial return.

The coefficient of distance from the farm homestead was significant at one percent and was positively related to farmland value. This implies that the distance of a farmland strongly affected the value, the nearer the farmland is to the farmers' homestead, the higher the value; the demand for the farmland will also increase as most farmers would want to acquire farmland closer to them and as a result, the supply will decrease, leading to increase in the value of farmland. This is contrary to the findings of Ogbuefi and Egbenta (2002), who reported that analyzing rental value of a farmland, location factors in relation to the distance were not significant predicator of land value.

The coefficient of access to road was significant at 10% and positively related to farmland value. This implies that availability of access road to farmland increases the value of the farmland and leads to higher productivity of food crops. Farmland with no access to roads do not attract high value, farmers considering the cost of bringing their output to the market may not acquire that type of farmland. (Oluwaji, O.A; Afolabi, O.J and Oyetubo, O.A., 2018) in their study posited that access to road increase the value of land. The coefficient of purpose of use was significant at five percent and negatively related to farmland value. This implies that the purpose of use has a negative influence on the value of farmland. What the farmland will be used for other than agricultural purpose affects farmland value. Farmlands that are converted for the purpose of building construction will attract a higher value than farmland kept for agricultural purposes. This is because these other uses usually attract higher returns. Also, due to higher risks involved in agriculture, farmers are usually unwilling to pay higher to acquire a farmland for agricultural production. (Bello, I.K and Arowosegbe, O.S 2014 ; Yu-Hui Chen, Chun-Lin Lee, Guan-Rui Chen, Chiung-Hsin Wang and Ya-Hui Chen.2018) in their research confirmed that a sharp rise in the value of agricultural lands on the pretext of development is the purpose of rise in the price.

The coefficient of community levy was significant at one percent and positively related to farmland value. This implies that the higher the community levy, the higher the value of farmland. The amount of levy the communities charged aside the rental price of a farmland has a negative impact on the value of the farmland. Olufemi (2017) affirmed that vacant lands were not levied in Nigeria thereby creating room for speculation by the users; development levies are charged by the communities thereby increasing the value of the farmland. The coefficient of duration of tenancy was significant at one percent and positively related to farmland value. Years of holding may determine the value of the farmland in the long run. This is because the farmland may have been subjected to improvements. Thus in the long run farmland value increases as the years of holding increases.

Table 4. Estimated Land Value in Imo State Per Annum

Variables	Imo Agricultural Zone(hectare/Farmer)
Farm Size	0.3124
Location	2.3045
Returns	2.1338
Soil Type	0.1209
Distance	4.7020
Productivity	0.8991
Cropping System	-0.9217
Access to road	3.3267
Purpose of use	-1.1411
Community levy	5.0592
Duration of Tenancy	163.7083
Intercept	7.228
	187.7322 **Anti-log** 187.7322
Land Value	₦ 53,975.91

Source: Field survey data, 2019.

Table 4 showed that the land value per annum for farmers was ₦ 53,975.91 which is considerably high for a rural farmer to pay per annum for a farm size which is less than a hectare of farmland. This may be the reason why most farmers in the study area operate at the small scale level and cannot afford to rent more farmland due to the high rental value. The higher the value of farm size, the lower the size of the farm holding. The implications are that the farmers may have to apply appropriate farm management practices based on their farm experience and level of education. The situation would be different if the farmland value in the area is low; in this instance farmers would be able to acquire more farm land and thereby increase their farm holding, achieve higher productivity and invariably higher returns. This disagreed with the findings of Ehirim *et al* (2017), that the value of land in Owerri is ₦ 278,193.52 for outright purchase but asserted that the value is considerably higher for agricultural production.

Conclusion

The study focused on the determinants of farmland value in Imo State, Nigeria. The study showed that the value of farmland was considerably high in the study area considering the fact that they were rural farmers which resulted to the farmers' inability to rent more farmland for production activities. The results further showed that the double log function was selected as a lead equation and was used to interpret factors influencing farmland value. Variables such as farm size, location, returns, distance, access to road, and purpose of use, community levy, and duration of tenancy, farm inputs, soil type, and quality of planting material, farm experience, household size and farm yield were the factors influencing farmland value in the study area.

Recommendation

Based on the findings of this research study, the research recommended that;

The annual rental value of farmland should be reduced through the removal of levies charged by the communities for the rural farmers whose income levels are low to enable them acquire farmland during the season of production, this will enable majority of them to have access to a farmland of their choices.

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