Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol.4, No.14, 2014

Land Tenure Systems and Farmers Efficiency and Profitability Analysis: a Case from Plateau State, Nigeria

Dawang, Naanpoes Charles, Seltim Bongnap Wormak and Matawal Mallo Obed

Department of Agricultural Technology, Plateau State College of Agriculture, Garkawa,

Mikang Local Government Area

*Correspondent author dawang4u@yahoo.com

Abstract

This research study investigate Arable Food production in Plateau State, which follows four pattern of the land tenure system namely; the Traditional inheritance Tenure System, the gift tenure system, the Purchase Tenure system and Hired Land tenure system. The purpose of this study was to empirically establish whether land tenure as an institution contributes to the observed Arable crop productivity differentials among Plateau State farmers. The study used a random sampling technique to obtain a sample of sixty farmers each from the three Agro-ecological zones of the State. Data were collected from the 2012/2013 production year using questionnaires administered to farmers at villages in QuaanPan, Langtang South, Mangu, Bokkos, Jos-East, and Jos-South local government areas. Data were analyzed using descriptive statistics and Stochastic Production Frontier Analysis. The result also shows that the profitability index for Inherited land farmers was 1.35, for gift farmers was 2.14, for Purchased farmers was 3.76 and Hired farmers was 2.43. The mean technical efficiency of Inherited land farmers was 61%, for gift land farmers was 59%, for Purchased land farmers was 84% and for Hired land farmers was 77%. The results confirmed the existence of differentials in crop yields of farmer's base on tenure holdings with tenure security found to influence land improvements. Therefore, a need for the review of the land tenure act of 1978 in order to clearly and sufficiently redefine tenure rights on farm Lands so, as to promote farmers productivity.

KEYWORDS: Productivity, Land Tenure, Efficiency, Profitability Indexes, Farm Income.

1 Introduction

The food and agricultural organization (FAO, 2007) has projected that present food production must increase 70% by 2050 in order to keep abreast with global population growth and changing diets. Land is the most important economic resource most particularly for developing countries with largely rural population, where most people earn a living through agriculture. Land tenure system determined the quantum of rights, kinds and nature of access that the farmer may have and consequently the way he/she uses the land.

Land tenure is right on land and its resources as yield by individuals and by group under rules of the society, Timmons (1972), Institutional arrangement with respects to the ownership and cultivation of agricultural land vary considerably both between and within countries. The economic effects of property rights to land is related to the improved access to institutional credit, improved investments in land, higher productivity, higher land values and higher output and incomes (Byamugisha, 1999). Bruce (1988) reported that tenure security may not be the cause of the high investments in land, rather it might be induced by the higher investment in the land, being the Purchase price.

An understanding of the relationships between Land tenure and productivity of smallholder farmers in addition to firm-specific practices would provide policy makers with information to design programs that can contribute to increasing food production potential among smallholder famers. This study tries to investigate those issues from the point of view of assessment of land tenure resource capacity, productivity, and land use/management base on technical efficiency, net farm income, profitability index and farm-specific constraints measurements in Plateau State.

2 Objectives of the Study

The main objective of the study was to assess the types of Land tenure systems and level of farm productivity among smallholder farmers in Plateau State. The specific objectives were to;

i. Determine the cost, returns and net farm income of all the categories of farmers in the study area.
ii. Estimates the technical efficiency and profitability indexes of all the categories of farmers in the study area.
iii. Evaluate the Farm-Specific constraints' facing farmers in the study area.

3 Theoretical Frameworks

3.1 Tenure security and productivity

Roth and Haase (1998) reported that farmers are more likely to make medium to long term improvements if tenure has security rights. Property rights are important for developing countries where a risk to assets is put forth as a crucial determinant of lagging growth (Collier and Ginning, 1999). Ayalew et al. (2005) argued that the perceived lack of transfer rights by farmers is the most important factor in explaining the relatively low investment in developing countries. West (2000) observed that there is varying access to land, levels of quality, levels of individualization of rights and control by traditional authorities in Africa. However, in Nigeria, the traditional tenure rights are not well defined. There is a tendency to undermine the importance of customary land tenure system which is an integral part of social, political and economic framework (Migot-Adholla et al., 1994). Norton (2004) argued that customary land tenure protects the poor and vulnerable member of society and it can be more flexible to changing economic circumstances than individual tenure. Place (2006) noted that when measured in terms of possession of land, which a farming household has strong continuous use rights alongside with transfer rights, the tenure security is relatively high in Sub-Saharan Africa.

Land conflicts in Southern Africa tend to emerge whenever, profitable investments arise which may be evidence that tenure security is not at its best as rent-seeking (Adams, 2001). The economic effects of property rights to land is related to the improved access to institutional credit, improved investments in land, higher productivity, higher land values and higher output and incomes (Byamugisha, 1999). Bruce (1988) reported that tenure security may not be the cause of the high investments in land, rather it might be induced by the higher investment in the land, being the purchase price. Aw-Hassan et al. (2000) observed that though the length of ownership to land is secure in customary tenure, there is lack of clear agreements and differential interpretations of some rules governing communal land. The lack of enforcement mechanisms in customary tenure creates insecurity in terms of number of absolute rights, assurance of existing rights and the costs of enforcing the rights (Fraser, 2004). Farmers' fear of expropriation over land on which an investment would have been made deters investments in fixed assets (Goldstein and Udry, 2005)

Also access to credit might be hindered if property rights are not sufficiently well defined for land to serve as collateral. FAO (2005) reported that tenure reform measures helped to change the cropping patterns in favour of certain tradable crops liken sugarcane, rubber and rice. Feder and Feeny (1991) observed that the major influences of productivity are those which constrain rapid agricultural technologies, namely; lack of credit, limited access to extension, small farm size, inappropriate land tenure system, insufficient human labour and capital, absence of mechanization options to ease constraints, lack of access and untimely farm inputs, and inappropriate transport and market facilities.

4 Methodology

4.1 Study Area

Plateau State is located in the middle belt zone of Nigeria and lies between latitude $8^{o}30'$ and $10^{o}30'$N, longitude $7^{o}30'$ and $3^{o}37'$E with a land mass covering 53,585 square metres, the state has an estimated population 3.78 million (NPC, 2013 estimate). The State has a slightly undulating highland, which rises from steep escarpment from the riverine plains of River Benue and descends towards Bauchi State. While hills and rock formation abound in the Northern and upper part of the State, Uninterrupted expanse of plains with dense vegetation are found in the Southern and lower part of the state. The predominant part of the State lies on high altitude of between latitudes 8^{o} – 10^{o} N and longitude 7^{o} and 11^{o}E.

On the basis of soils, climate and typical farming system, the state is classified into three distinct agro ecological zones, namely; the lowland moist Savannah which falls within the Southern Guinea and Savannah rain forest, having extensive low lying flat land with high water holding capacity is favorable for the production of rice, yam, cassava, melon and groundnut. The Mid-altitude Zone which falls within 500-1500 meters above sea level, with soils which are sandy clay and heavy rains, while predominantly maize, Irish potato and assorted vegetables are produced; and the Sub-Sudan and Northern Guinea Savannah zones falls within 100-350 meters above sea

level, with high concentration of livestock and production of crops like Millet, Groundnuts, Sorghum and Cowpea.
It share boundaries with Nasarawa to the East, Kaduna to the North, Bauchi to West, Taraba to the South, has a captivating physical features with high lands rising from 1200m to 1820m above sea levels. The major ethnic groups include Taroh, Berom, Ngas, Mwaghavul, Pan, Goemai etc. The peoples' predominant occupation includes farming, fishing and hunting.

4.2 Sampling Procedures
The smallholder farmers involved in the farming of major cash crops in some selected areas were used as case studies to arrive at a general overview of types of Land tenure holdings and farm Productivity in the study area. The sampling procedures summarized and presented in Table 1 indicated that six local governments were purposively selected in view of their farming significance and to ensure geographical spread of selected sites to cover the state. Specifically, thirty farmers randomly selected from each of the purposively selected local governments were randomly selected and interviewed. This gave a total sample size of one hundred and eighty farm households heads. The interviews were conducted to farmers actively involved in fulltime farming only. The household heads were used as the sampling unit because they represent economic decision-making units.

Table 1 sample size and location

LOCAL GOVT	**SAMPLE SIZE**	**VILLAGES**	**LOC. SIZE**
QUAANPAN	30	SHANGFUUP	10
		HANCINKAR	10
		E	10
		ESPAT	
L/SOUTH	30	MAGAMA	10
		ANG-	10
		KWALA	10
		KUKUKI	
BOKKOS	30	TANGUR	10
		BUTURA	10
		RUWI	10
MANGU	30	KERANG	10
		JIPLIK	10
		KWANG	10
JOS-SOUTH	30	BISICHI	10
		KURU	10
		HEI	10
JOS-EAST	30	FUBOR	10
		MAIJUJU	10
		KERKER	10
TOTAL	**180**	**18**	

4.3 Data Collection
Primary data were employed for the research and collected using questionnaire administered to thirty yam farmers in QuaanPan and Langtang South local government areas each. Furthermore, the questionnaires were also administered to thirty Irish Potato farmers of Bokkos and thirty farmers in Mangu, as well as to thirty Acha farmers of Riyom and thirty Cassava farmers of Jos-East local governments. Information collected include: socioeconomic characteristics, land tenure arrangement, inputs, outputs, prices, rent on land, depreciations, costs, returns, and farmer-specific constraints.

5 Analytical Techniques

5.1 Farm Business Analysis

This was used to show the level of costs, returns, Net farm Income and profitability index for farmers under the existing land tenure systems. The farm business analysis measures the strength and weakness of the farm (Olukosi and Erhabor, 1987). The indicators used in this work were the Net farm Income (NFI) and Profitability Index. The item of revenue - value of total output and the cost items considered were variable costs; labour, fertilizer, herbicide,/pesticides and seeds/planting materials, while fixed costs were; depreciation on equipments and rents on land. The total return was estimated by multiplying the total weight of output by their prevailing market prices. The model used was represented by the equation;

$$NF1 = \sum_{i=1}^{n} P_i Y_i - \sum_{j=1}^{m} P_{xj} X_j - \sum_{k=1}^{k} F_k$$

Where;

NFI = Net farm Income (₦)
Y_i = output (kg/year)
P_i = Unit price of output (₦ / kg)
X_j = Quantity of variable input (where j=1, 2, 3 . . . m)
Px_j = Price/Unit of variable input (₦)
F_k = Cost of fixed inputs (Where k = 1, 2, 3…k fixed input)
$\sum$ = Summation (addition) sign.

The Net farm Income (NF1) is gross receipt less total cost. Profitability index (rate of return on an investment) was employed to explain the extent to which a Naira invested into farming will contribute to total value of output. The rate of return on investment into an enterprise is the ratio of net farm income to total cost of farming.

5.2 Stochastic Frontier Production Function Analysis (SFA)

The Stochastic frontier model was simultaneously used to estimate the technical efficiencies and inefficiencies of individual farmers using the maximum-likelihood estimation (MLE) program in a FRONTIER 4.1c (Coelli, 1993). The use of SFA will enable managers to understand individual farmers level of technical efficiency in the existing land tenure function where the maximum attainable output of individual at a certain time is a function of four productive inputs, labour, fertilizer, herbicide and seeds, represented by;

$Y_i = f(E_1, E_2, E_3, E_4, Si)$- - - - - - - - - - (i)

Where;

Yi = yam, cassava, Irish potato or Acha
E_1 = is the labour measured in man days.
E_2 = represents the fertilizers used during production year and measured in kg.
E_3 = represents the number of litters of herbicides used.
E4 = represents the weight of seeds/materials used.

To estimate the Equation above, the first best option was to consider a Cob-Douglass flexible functional form, as well as being theoretically plausible (Berodt and Christensen, 1973); it's specified as follows:

$\ln Y_j = \beta_o + \beta_1 \ln E_1 + \beta_2 \ln E_2 + \beta_3 \ln E_3 + \beta_4 \ln E_4 + (V_i - \mu_i)$ - - - - (ii)

Where; subscript j refers to the jth farmer in the sample. In denotes the natural logarithm (base e). A logarithmic transformation provides a model which is linear in the logarithmic of the inputs. The deviations ε_i in equation from the production frontier $[f(E_i\ S_i)]$ are represented by an asymmetric two-sided error composed of a two-sided random (v_i) and a consider error term ($\mu_i \geq O$); $E_i = v_i - \mu_i$. The stochastic error V_i is usually assume to be normally distributed, with Zero mean and constant variance. The μ_i in equation (ii) is the technical inefficiency effects, assumed to depend on some selected farm-specific variables which were included to indicate their possible influence on the technical inefficiencies of the farmers.

Where;

$\mu_i = b_o + b_1D_1 + b_2D_2 + b_3D_3 + b_4D_4 + b_5D_5 + b_6D_6 + b_7D_7$ - - - - - (iii)
D_1 = Age of farmers (number of years)
D_2 = Educational status (number of years)
D_3 = Experiences of farmers (number of years)
D_4 = Household size of farmers (number of dependence)
D5 = Cooperative society membership (dummy, 0, 1)
D6 = Extension contact (dummy, 0, 1)

D7 = Access to Credit (dummy, 0, 1)

Test for the presence of technical inefficiency effects using generalized likelihood ratio, is defined by chi-square (χ^2) test statistics (Greene, 2000). The test statistics, $\chi^2 = -2\text{In}\ (H_o/H_a)$

H_o: Total variation in output is not due to technical inefficiency

H_a: Total variation in output due to technical inefficiency effects.

When inefficiency was estimated, Technical Efficiency (TE) was computed using,

TE = E [exp (- μi)/ (v - μi)]

6 **Results and Discussion**

6.1 Costs, Returns and Profitability Analysis

The costs, returns and profitability analysis of farmers having land under different tenure systems were calculated as indicated in Tables 2, 3, 4, 5, 6, 7, 8 and 9. The daily prevailing average wage rate at QuaanPan and Langtang South was ₦400, while, wage rate at Bokkos was ₦850, and wage rate at Mangu was ₦500, while, Riyom wage rate was 800 and ₦1000 for Jos-East. The results for inherited land farmers presented on Table 3 indicated that labour makes up about 47.03 percent of cost inputs used by farmers of inherited lands and being the highest cost item, while Agro-chemical makes up about 10.51 percent, which is the least cost item. The farmers in the study area make a profitability index of 1.35, meaning that for every one naira invested in the enterprise gives a return of one naira thirty five kobo.

Table 3 Net farm income for inherited land farmers

items		naira	percent
A	Returns	12,030,707	
B	Cost		
i.	Labor	2,405,943	47.03
ii.	Fertilizer	1,116,400	21.82
iii.	Seeds	957,301	18.71
iv.	Agro- Chemical	537,550	10.51
v.	Depreciation/rent	984,561	19.23
C.	Total Cost	5,115,050	
D.	Net Farm Income	6,915,057	
E.	Profitability Index	1.35	

The results from farmers who acquired land by gifts as presented on Table 4 shows that labour was the highest cost item with about 52.60 percent and Agro-chemical has the least amount of 07.46 percent. The farmers in the study area have a profitability index of 2.14, meaning that for every one naira invested in the enterprise gives a return of two naira fourteen kobo.

Table 4 Net farm income of gift land farmers

	items	Naira	percent
	A Returns	2,430,727	
	B. Cost	-	
vi.	Labor	405,943	52.60
vii.	Fertilizer	116,400	15.08
iii.	Seeds	97,301	12.61
ix.	Agro- Chemical	57,550	07.46
x.	Depreciation/rents	94,561	12.25
C.	Total Cost	771,755	
D.	Net Farm Income	1,658,972	
E	Profitability Index	2.14	

Table 5 shows farmers who acquired land by hiring; the highest cost item was fertilizer with about 33.83 percent, while the least cost item was depreciation/rent with 09.45 percent. Seeds/materials cost 20.50 percent. The farmers in the study area can make a profitability index of 2.43, meaning that for every one naira invested in the enterprise gives a return of two naira forty three kobo.

Table 5 Net farm income for lands owned by hiring

	items	Naira	percent
A	Returns	1,099,250	
B	Cost	-	
i.	Labor	71,050	22.17
ii.	Fertilizer	108,410	33.83
i.	Seeds	65,710	20.50
iv.	Agro- Chemical	45,040	14.05
v.	Depreciation	30,250	09.45
C	Total Cost	320,460	
D	Net Farm Income	778,690	
E	Profitability Index	2.43	

The result presented on Table 6 also indicated that farmers who purchased land for farming had lowest cost item in of labour with about 09.73 percent only, while about 36.15 percent of seeds/plant materials and 34.18 percent of Agro-chemical. The farmers in the study area make a profitability index of 3.76, meaning that for every one

naira invested in the enterprise gives a return of three naira seventy six kobo. This was the highest amount of the types of tenures on land in the study area.

Table 6 Net farm income of Purchase land farmers

A	Items	Naira	percent
	Returns	3333000	
B	Cost	-	
	i. Labor	68,100	09.73
	ii. Fertilizer	83,400	11.92
	iii. Seeds	253,000	36.15
	iv. Agro - Chemical	239,200	34.18
	V Depreciation/rent	56090	08.02
C	Total Cost	699,790	
D	Net Farm Income	2,633,210	
E	Profitability Index	3.76	

6.2 Stochastic Frontier Analysis

The result presented on Table 7 shows that gamma (γ) parameter which measures technical inefficiency was statistically significant at 1%, indicating that there was deviation from frontier. The LR test shows that there were technical inefficiency effects, suggesting that deviation from frontier was as a result of technical inefficiency effects. The Return to Scale (RTS) was 2.27 implying a increasing RTS. This signifies that farmers were operating at irrational stage 1 of production function. The distribution of efficiency scores of farmers shows that about 48% of farmers were operating at efficiency level of less than 60%, while about 2% of farmers were operating at 80% or more efficiency level. The result indicated that only about 25% of farmers were operating at 50% or more efficiency level. The mean technical efficiency level was 61.45 %, suggesting the existence of inefficiency percentage of 39.

Table 7 Stochastic frontier estimate of TE for inherited tenure farmers

	OLS			ML		
Variable	Coeff.	S.E	t-ratio	Coeff.	S.E	t-ratio
Intercept	5.37	2.54	2.10	5.56	1.05	5.27*
Labour	0.33	0.38	0.87	0.29	0.17	1.72**
Fertilizer	0.45	0.73	0.611	0.47	0.39	1.21
Seeds/setts	0.29	0.90	-0.32	-0.15	0.63	-0.23
Herbicides	0.015	0.15	-0.98	-0.022	0.095	-0.23
Constant	0			-0.047	-0.15	-0.31
Age	0			0.10	0.18	0.55
Experience	0			-0.12	-0.16	-0.75
Education	0			-1.85	-1.82	-1.01
Cooperative	0			0.097	0.027	0.35
Extension contact	0			0.083	0.065	1.27
Credit Access	0			-0.092	-0.05	1.98**
Household size	0			0.144	0.07	2.05**
δ^2	0.31			0.34	0.12	2.81*
ý	0.71			0.68	0.15	4.48*
Log likelihood				-124.55		
LR test				16.84		

*, ** significant at 1% and 5% respectively

Table 8 shows that gamma (γ) parameter which measures presence of technical inefficiency was also statistically significant at 1%, indicating that there was 41% deviation from frontier and variation from output was as a result of difference in their socio-economic characteristics. The LR test fails to reject the hypothesis that there were no technical inefficiency effects, suggesting the existence of technical inefficiency effects among the farmers of gift land tenure system. The Return to Scale (RTS) was 2.49 implying an increasing RTS. This means that investing in farming using gift lands will yield a more than proportionate return, suggesting that farmers can increase input factors to expand their output per hectare.

Table 8 Stochastic frontier estimate of TE for gift tenure farmers

	OLS			ML		
Variable	Coeff.	S.E	t-ratio	Coeff.	S.E	t-ratio
Intercept	5.37	2.54	2.10	8.4	1.4	6.1*
Labour	0.33	0.38	0.87	0.16	0.06	2.4*
Fertilizer	0.45	0.73	0.611	-0.89	0.60	1.40
Seeds/setts	0.29	0.90	-0.32	0.13	0.76	1.07
Herbicides	0.015	0.15	-0.98	-0.58	0.26	-2.4**
Constant	0			0.003	0.028	0.04
Age	0			1.3	0.59	2.2**
Experience	0			0.03	0.04	0.40
Education	0			0.89	0.83	-1.07
Cooperative	0			0.010	0.018	-5.44*
Extension contact	0			0.023	0.048	0.47
Credit Access	0			0.051	0.047	1.08
Household size	0			0.03	0.012	2.8*
δ^2	0.43			0.064	0.017	3.6*
ý	0.75			0.87	0.123	8.0*
Log likelihood				-124.55		
LR test				25.25		

Mean TE = 59

The gamma (γ) parameter which measures technical inefficiency was statistically significant at p<0.00 and indicates that there was deviation from frontier. The LR test shows that there were no technical inefficiency effects, suggesting that deviation from frontier was not as a result of technical inefficiency effects in the farm. The value of gamma parameter was 0.89, suggesting that 89% of variation in catch was due to random factors. This then means that OLS model was the adequate representation of data. The Return to Scale (RTS) was 0.181 implying a decreasing RTS. This signifies that farming for hired land farmer was experiencing a decreasing return to scale, meaning that production function is in stage 11 of the production. The variable "seeds/sett/ planting material" and Agro-chemical were negative implying they are in excess use. The efficiency scores of farmers for at hired land shows that 85% of the farmers are operating at 60% or more efficiency level. All the fishers were operating at an efficiency level of 50% or more. The mean efficiency level was 77%.

Table 9 Stochastic frontier estimate of TE for hired tenure farmers

	OLS			ML		
Variable	Coeff.	S.E	t-ratio	Coeff.	S.E	t-ratio
Intercept	5.37	2.54	2.10	5.56	1.05	5.27*
Labour	0.33	0.38	0.87	0.29	0.17	1.72**
Fertilizer	0.45	0.73	0.611	-0.098	1.3	-7.2*
Seeds/setts	-0.29	0.90	-0.32	-0.27	0.23	-1.1
Herbicides	-0.015	0.15	-0.98	0.016	4.41	0.39
Constant	0			0.089	0.29	0.32
Age	0			0.12	0.20	0.599
Experience	0			-0.003	0.20	-0.014
Education	0			-0.42	2.2	-2.37*
Cooperative	0			0.097	0.0027	0.35
Extension contact	0			0.083	0.065	1.027
Credit Access	0			0.092	0.05	-1.93*
Household size	0			-0.27	0.23	-1.1
δ^2	0.50			0.016	4.41	0.39
ý	0.56			0.89	0.29	0.32
Log likelihood				-17.55		
LR test				3.12		

MTE = 77

The estimated gamma parameter of MLE model was statistically significant at 1% LOS with value 0.95, indicating that about 95% of the variation in the output among the farmers was due to differences in their technical inefficiencies efficient. Technical inefficiency model indicated that the education, cooperative society membership and access to credit of the farmers show statistical significance. The sum of partial elasticity was 0.47, implying a decreasing return to scale and inputs would return a less than proportionate output. However, exploitation was at stage of profit maximisation.

Generally, limited number of farm displays substantially lowers levels of technical efficiencies in the purchase lands. The arithmetic means of the individual efficiency scores of 0.77 for hired lands and 0.84 for purchased land are consistent with Schultz's (1964) thesis of "Poor and efficient" smallholders and peasant farmers in developing country agriculture. The purchased land technical efficiency estimate shows that 30% of the farmers were operating at 90% or more efficiency level, while 3.75% are operating at efficiency level below 50%. The result further indicated that about 80% of farmers were operating at 80% or more. Similarly, 96.25% of the sample farmers were operating at 50% or more and mean technical efficiency level score of farmers was 84.16%.

Table 10 Stochastic frontier estimate of TE for Purchased tenure farmers

	OLS			ML		
Variable	Coeff.	S.E	t-ratio	Coeff.	S.E	t-ratio
Intercept	5.37	2.54	2.10	5.56	1.05	5.27*
Labour	8.4	1.4	6.1	0.19	0.017	1.92**
Fertilizer	0.16	0.06	2.4	0.47	0.39	0.11
Seeds/setts	-0.89	0.60	1.4	-0.15	0.63	-0.73
Herbicides	0.13	0.76	1.7	-0.022	0.095	-0.83
Constant	0			-0.047	0.15	-0.31
Age	0			0.10	0.18	0.55
Experience	0			-0.12	0.16	-0.75
Education	0			1.3	0.59	2.2**
Cooperative	0			-0.02	0.012	-2.2**
Extension contact	0			0.089	0.29	0.32
Credit Access	0			-0.007	0.011	-6.8*
Household size	0			0.52	0.37	1.3
δ^2	0.35			0.82	0.96	0.84
ý	0.67			0.95	0.23	4.30*
Log likelihood				-134.23		
LR test				21.84		

MTE = 84

7 Conclusions

Food production in Nigeria follows a four way pattern of the land tenure system. As an institution, land tenure plays a major role in the performance and development of the food sector by influencing the land ownership and use patterns as well as the productivity of the land. Evidence shows that the net farm income and profitability index of crops cultivated on purchased land are much higher than those cultivated all other tenures. Purchased tenure farmers have better education, more land, spent more on adoption of technology than other farmers. The technical efficiency of purchased farmers was 84% and hired farmers were 77%, suggesting that the two systems were best for growth and development of Agricultural.

The results of the stochastic frontier models show that Access to credit, cooperative society membership, Education, age and household size were farm-specific constraints observed among the farmers in the study area This may implies that property rights to land contribute significantly to the observed differentials in accessibility to credit, education, cooperative society membership and household size in the study area, hence the hypothesis that land tenure has no effect on productivity is rejected.

8 Recommendations

In light of the challenges for food self reliance, growth and development of the agricultural sector, it is recommended that land tenure reform on inherited agricultural lands be undertaken with the view to sufficiently liberalise land rights. This is to suggest that government need to redefine the land use decree of 1978, so as to separate farm Lands from Lands for other uses as the land tenure affects their productivity.

9 Reference

Aw-Hassan, A., M. Alsanabani and A.R. Bamatraf, 2000. Impact of Land Tenure and Other Socioeconomic Factor s on Mountain Terrace Maintenance in Yemen. CAPRi working paper No. 3. International Food Policy Research Institute, Washington DC, USA

Ayalew, D., S. Dercon and M. Gautam, 2005., Property Rights in a Very Poor Country: Tenure Security and Investment in Ethiopia. The World Bank, Oxford University

Bruce, J.W., 1988. The variety of reform: A review of recent experiences with land reform and the reform of land tenure, with particular reference to African experience. Land Centre, University of Wiscon, USA.

Byamugisha, K.F., 1999. The effects of land registration on financial development and economic growth: A case study of Thailand. School of Surveying, University of East, London

Collier, P. and J.W. Gunning, 1999., Explaining African economic performance. Agric. Econs. J., 37(1):64-111.
Coelli, T.J. (1993). "A Guide to Fronlier version 4.1:A Computer program for frontier production function Estimation", CPA Working Paper 96/07, Department of Econometrics, University of New England, Armidale.
FAO, 2005. Food and Agricultural Organization Report., Ministry of Agriculture and Cooperatives. Government Printer, Mbabane, Swaziland
Greene, W. (2003). "Econometric Analysis" 5th Edition Pretence Hall, New Jersey.
Feder, G. and D. Feeny, 1991. Land tenure and property rights: Theory and implications for development policy. World Bank Econ. Rev., 5: 137-138.
Fraser, G., 2004., Obstacles to agricultural Development in the Communal Areas of Eastern Cape. A report for Eastern Cape Provincial Growth and Development Plan, Appendum. Retrieved from: www.ecoprov. gov.za/modules/pgdp/file.pdf, (Accessed on: March 24, 2011).
Goldstein, M. and C. Udry, 2005. The Profits of Power: Land Rights and Agricultural Investment in Ghana. The World Bank, Yale University. Retrieved from: www.eco.yale.edu/`cru2/pdf/goldstein.pdf, (Accessed on: March 24, 2011).
Migot-Adholla, S.E., F. Place and W. Olusch-Kosura, 1994. , Security of tenure and Land Productivity in Kenya. Searching for land tenure in Africa, IOWA: Kendall/Hunt.
Norton, D.R., 2004. Agricultural Development Policy: Concepts and Experiences. Food and Agricultural Organizations of the United States, pp: 109-176.
NPC, (2003). National Population Commission, Abuja, Nigeria
Olukosi, J.O., and Erhabor, P.O. (1987) Introduction to farm Management Economics: Principles and Applications. AGITAB Publishers LTd Zaria, Nigeria
Place, F., 2006. Land Tenure and Agricultural Productivity in Africa: A comparative Analysis of Economic Theory, Empirical Results and Policy Statements. World Agro- forestry Centre Nairobi, Kenya.
Roth, M. and D. Haase, 1998. Land tenure security and agricultural performance in Southern Africa: Basis, broadening, access and strengthening input market systems. Madison, Land Tenure Centre, University of Wisconsin.
Schultz, T.W., (1964) Transforming traditional Agriculture. New Haven, C.T: Yale University Press.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar