
**COMPARATIVE ANALYSIS OF RICE PRODUCTIVITY OF FARMERS ON
DIFFERENT LAND TENURE SYSTEMS IN IMO STATE**

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ABSTRACT: *This study compared and analysed the rice productivity of farmers on different land tenure systems in Ihitte/Uboma Local Government Area. A multistage sampling technique was used to select 50 rice farmers for the study. Data were collected with a well structured questionnaire and were analysed using descriptive statistics, ordinary least squares multiple regression techniques, net farm income model, total factor productivity and the Z- test statistics. The result showed that 48% of the respondents practised the individual land tenure system. Their major method of land acquisition is through communal followed by inheritance. The average land size cultivated on was 1.98ha. 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. The net returns per hectare of rice farmers on communal and individual land tenure system were ₦8, 721.25 and ₦17, 327.91 respectively. The mean of the total factor productivity computed for communal and individual land tenure systems were 1.89 and 3.06 respectively. This implies that there was statistically significant difference between the productivities of rice farmers on the different land tenure systems in the study area. It is therefore concluded that with increased capital, improved varieties/technology and skilled labour, the level of profit would increase.*

KEYWORDS: Agriculture, Rice, Land Tenure, Agricultural Productivity, Land Amendment.

INTRODUCTION

Agriculture accounts for over 70 percent of the active labor force, and more than 23 percent of the Gross Domestic Product in Nigeria (World Bank, 2007). Agriculture is the mainstay of the majority of Nigerian rural poor, producing major food crops comprising cereals such as sorghum, maize, rice; tubers such as yams, cassava, legume such as groundnut and cowpea as well as vegetables. Nigeria is the most populous country in Africa, with a population of over 40 million people (NPOC, 2006); the larger part of which is poor and food insecure, with women and children mostly affected. The food produced, mostly at subsistent level is inadequate due to low crop yield. FAO (1999) observed that the average crop yields for the Africa region have remained low over the last decade; while increases in food production have been achieved largely through extending the area under cultivation rather than productivity-improving technologies. Thus the food produced has not been able to sustain access of all people at all times, to adequate food and nutrition for a active and healthy life, in most parts of African region. According to the World Bank (1996), poverty is hunger, among other indicators; and Nigeria with Human Poverty Index value of 37.3, ranked among the poorest countries in the world (UNDP, 2005).

Rice is a major staple food in Nigeria, but its domestic production has never been able to meet the demand; FAO (1999, 2006) and Erenstein et. al., (2003) observed that the demand and supply gap in rice production is widening, resulting in huge import bill on rice. The National Special Programmes on Food Security (NSPFS) and the Presidential Initiative on rice, aimed at attaining food sufficiency in local production of rice in the short term (2005) and increased export in the medium term (2007), with targets of 3 million hectare cultivation, and 15 million tons of paddy rice or 9 million metric tons of milled rice (FMAWR, 2008). Despite these efforts, Nigeria is still the world's largest importer of rice (FAO, 2006).

The Federal government of Nigeria took a decision against importation of some agricultural products to protect and to encourage local production of such crops among other reasons. However, that decision does not affect rice as free flow of imported rice is encouraged. This is because local supply of rice is not keeping pace with demand. Currently, Nigeria spends more of its export earnings on food importation. For instance the food importation bill of Nigeria which was N 102,185.1million in 1993 shoot up to N176,670.31million in the year 2007 (CBN, 2008). The shortage in supply of rice is reflected in the increase in its price over years. Rice is one of the oldest known cultivated crops (Hard castle, 1991). The ever increasing demand for rice as a staple food for human consumption and raw material for industrial uses has strengthened the zeal with which most countries produce rice.

In Nigeria, rice is grown almost in all states of the Federation (IITA, 1992). In Imo state, rice is grown to a large extent. The rice production in the state over years ranges from 0.7metric/tonnes to 2.18 metric/tones. The average yield of rice over years ranges from 2.5metric tonnes per hectare to 5.5metric tonnes per hectare across various localities in the state. The average area cropped under rice in Imo state over years ranges from 0.36 hectares to 1.50 hectares. Considering the geometric increase in population and unsteady food production rate, it becomes imperative that more food should be produced to meet up the population growth. Rice has become so popular in Nigeria that it is no longer food for special festive, but sustains a large proportion of Nigerian population (Iloba, 1976).

Timmons (1943) defines land tenure as the relationship between individuals and society, growing out of the use of land. This includes relationships between mortgages (public and private) and mortgagors, landlords (public and private) and tenants, operators and labourers on the other. In a broader sense, it includes the relationship between society and landowners, operators and labourers – through the use of policy, eminent domain and tax powers – in all instances where these relationships impinge upon rights in land. Emphasis of the above definition is on a broad spectrum of the relationships encompassed in the expression 'land tenure'. But the relationships arise in the process of exchanging, transferring or acquiring rights in land. Parson (1970), concisely defines land tenure as 'systematization of the rules which function by specifying what different classes of persons may or may not, must or must not with inference to the occupancy, use, abuse or disposition of land.

Land tenure is defined as the system of land ownership or acquisition by individual, family, community or government agency either for temporary or permanent use. Land tenure is the relationship, whether legally or customarily defined among people, as individuals or groups, with respect to land. Land tenure is an institution, that is, rules invented by societies to regulate behaviour. Land Tenure in Nigeria can broadly be classified into three main types namely; communal, individual (private) and public (state controlled). Communal land is such that is held under an arrangement that provides for joint or communal use of land. Under

individual tenure, land is available to the individual owner for agricultural purpose, but may be given out to other farmers on a rental basis, especially for cultivation (Arua and Okorji, 1997). State-held (public) lands are usually made available to individuals or private investors, cooperative societies and other organizations or groups of individuals on request if approved by the state governor (Arua and Okorji, 1997; Land Use Act 1978). The general performance of land tenure in Nigeria is affected by socio-economic, sociological, cultural, traditional, religious and institutional factors.

Agricultural productivity is measured as the ratio of agricultural outputs to agricultural inputs. Therefore output is usually measured as the market value of final output, which excludes intermediate products such as corn feed used in the meat industry. This output value may be compared to many different types of inputs such as labour and land (yield). These are called partial measures of productivity. Agricultural productivity may also be measured by what is termed Total Factor productivity (TFP) when all crops of the farm are in the numerator and all inputs in the denominator. When a single input is used (with one or more output) one has partial factor productivity. This method of calculating agricultural productivity compares an index of agricultural inputs to an index of outputs. This measure of agricultural productivity was established to remedy the shortcomings of the partial measures of productivity notably that it is often hard to identify the factors that cause them to change. Changes to total factor productivity are usually attributed to technological improvements. Olayide and Heady (1982), defined agricultural productivity as the index of the ratio of farm output to the value of the total input used in producing the output.

A land/soil amendment is any material added to a soil to improve its physical properties such as water retention, permeability, water infiltration, drainage, aeration and structure. The goal is to provide a better environment for roots. Amending a soil is not the same thing as mulching, although many types of mulch also are used as amendments. Mulch is left on the soil surface. Its purpose is to reduce evaporation and run-off, inhibits weed growth and creates an attractive appearance. Mulches also moderate soil temperature. Organic mulches may be incorporated into the soil as amendments after they have decomposed to the point that they no longer serve their purpose. The primary aim of soil amendment is to provide nutrient for crop growth or to provide material for soil improvement.

The specific objectives include to:

- identify the method of land acquisition and the types of land tenure systems of rice farmers in the study area.
- ascertain the profits of rice farming activities on different land tenure systems
- estimate the productivity of rice farmers on different land tenure systems in the study area.

The null hypothesis (H_0) of the study: There is no significant difference between the rice productivity of farmers on different land tenure system.

METHODOLOGY

This study was conducted in Ihitte/Uboma local government area of Imo state. Data for the study were collected from both primary and secondary information sources. Data were analysed using appropriate statistical and econometric tools such as descriptive statistics (mean, frequency distribution and percentages), Z – test statistics, productivity indices such as total factor productivity and net farm income model.

RESULTS AND DISCUSSION**Ascertain the Methods of Land Acquisition**

The percentage and frequency distribution of farmers according to the methods of land acquisition is represented in table 1

Table 1- Methods of Land Acquisition of farmer respondents

Method of Land Acquisition	Frequency	Percentage (%)
Communal	21	42
Inheritance	18	36
Lease	7	14
Purchase	4	8
Total	50	100

Source: Field Survey, 2013.

The table 1 showed that 42% of rice farmers acquire land through communal, 36% of rice farmers through inheritance, 14% through lease and 8% of rice farmers through purchase. This implies that majority of rice farmers in the study area acquire land through the communal method of land acquisition.

Table 2- Distribution of farmers according to Types of Land Tenure systems

Types	Frequency	Percentage (%)
Communal	21	42
Individual	29	48
Total	50	100

Source: Field Survey, 2013.

The table 2 showed that 42% of rice farmers practiced communal land tenure system while 48% practiced individual land tenure system. This implies that the individual land tenure system dominated the communal land tenure system in the study area. This also showed that the state or public type of tenure do not exist in the study area.

Ascertain the Profits of Rice Farming Activities on the Different Land tenure System

Table 3-Costs and Returns Analysis on Rice Production/ Hectare for Communal Land tenure system

Items	Quantity(kg)	Unit Price(N)	Value(N)/ha	Percentage Contribution to Total Cost
Returns				
Rice Output (Kg)	12.7	3724.39	47299.70	
Total Return			47299.70	
Variable Costs				
Agro – chemicals (fertilizers, herbicides)	22	284.53	6259.64	16.2%
Labour(mandays)	14	1044.09	14617.21	37.9%
Bags (number)	2	1091.25	2182.49	5.7%

Transportation,			2545.99	6.6%
RiceSeed(Kg)	41.54	98.58	4094.97	10.6
Total Variable Cost			29700.30	77%
Fixed Cost				
Rent on Land(N)			1765.58	4.58%
Depreciation				
Total Fixed Cost TFC			8878.15	23%
TotalCost(TVC+TFC)			38578.45	100.00
Net Return (NR)			8721.25	
Return Per Naira			22.6%	

Source: Field Survey, 2013.

Table 4-Profitability of Rice Farming Activities For Communal Land Tenure(ha)

Benefit Cost Ratio	1.23
Gross Ratio	0.82
Expense Structure Ratio	0.23

Source: Field Survey 2013.

Table 5-Costs and Returns Analysis on Rice Production Per Hectare for Individual Land Tenure System

Items	Quantity(kg)	Unit Price (N) (N)/ha	Value	Percentage Contribution to Total Cost
Returns				
Rice output(Kg)	28.4	2521.74	71739.13	
Total Gross Return			71739.13	
Variable Cost				
Agro- chemicals (Kg)	45.61	226.32		19%
Hired Labour (mandays)	19.58	815.68		29.3%
Other Expenses				12.3%
Rice Seed(Kg)	61.59	122.83		14.0%

	7565.22	
Total Variable Cost (TVC)	40589.86	74.6%
Fixed Cost		
Rent		9.1%
	4956.52	
Depreciation	1631.85	
Total Fixed Cost (TFC)		25.4%
	13821.37	
Total Cost (TC)	54411.22	100.00
Net Return (NR)	17327.91	
Returns per Naira		31.8%

Source: Field Survey, 2013.

Table 6-Profitability of Rice Farming Activities for Individual Land Tenure System(ha)

Benefit Cost Ratio	1.32
Gross ratio	0.76
Expense Structure Ratio	0.25

Source: Field Survey, 2013.

The mean annual cost of inputs and output of rice farming activities on communal and individual land tenure system is shown in the tables 3 and 5 respectively. The total output costs of rice farming activities were **₦47, 299.70** and **₦71, 739.13** respectively. The total fixed costs which were **₦8, 878.15** and **₦13, 821.37** represented **23%** and **25.4%** of total cost respectively and the total variable costs were **₦29, 700.30** and **₦40, 589.86** represented by **77%** and **74.6%** of total cost respectively. However, the gross returns were **₦47, 299.70** and **₦71, 739.13** respectively, the net returns were **₦8, 721.25** and **₦17, 327.91** respectively and the returns per naira from the enterprise were **22.6%** and **31.8%** respectively implying that on every naira invested, a profit of **23kobo** and **32kobo** were realised respectively.

The Benefit Cost Ratio (BCR= TR/TC) on tables 4 and 6 shows that the BCR for communal and individual land tenure system were **1.23** and **1.32** respectively showing an increase in returns. It indicates that the enterprise on the different land tenure systems (communal and individual) is profitable. It is probable that with increased capital, improved variety/technology and skilled labour, this ratio would increase.

Gross Ratio (GR= TC/TR). The values are **0.82** and **0.76** respectively. This implies that from every **₦1.00** return to the industry **82.00kobo** and **76.00kobo** respectively is being reinvested in the enterprise.

Expense Structure Ratio (ESR= FC/TC). The values of the expense structure ratio are **0.23** and **0.25** respectively which implies that about **23%** and **25%** of the total cost of production is made up of fixed cost components. This makes the business worthwhile for investment.

Estimate the Productivity of Rice Farmers on Different Land Tenure System in the Study Area

The productivities of rice farmers on communal and individual land tenure system were estimated using the Total Factor Productivity index, which was mathematically expressed as;

$$TFP = \frac{Q}{TVC}$$

Where, TFP= total factor productivity, Q= output and TVC= total variable costs

Table 7-Total Factor Productivity Indices of Rice Farmers on Communal Land Tenure System

Total Factor (range)	Frequency	Percentage (%)
0.78 – 1.18	2	10
1.19 – 1.59	5	24
1.60 – 2.00	4	19
2.10 – 2.50	7	33
2.51 – 2.91	3	14
Mean	1.89	
Total	21	100

Source: Field Survey, 2013.

The table showed that the mean total factor productivity of rice farmers on communal land tenure system is 1.89. It also showed that seven (7) farmers on the communal tenure system have the highest total factor productivity range which is between 2.10 – 2.50. The result implied that rice farming activities on communal land tenure system in the area is productive.

Table 8-Total Factor Productivity Indices of Rice Farmers on Individual Land Tenure System

Total Factor (range)	Frequency	Percentage (%)
1.51 – 2.11	2	7
2.12 – 2.72	4	14
2.73 – 3.33	15	52
3.34 – 3.94	7	24
3.95 – 4.55	1	3
Mean	3.06	
Total	29	100

Source: Field Survey, 2013.

The Table 8 shows that the mean total factor productivity of rice farmers on individual land tenure system is 3.06. It also showed that fifteen (15) farmers on the individual land tenure system have the highest total factor productivity range between 2.73 – 3.33. The result implied that rice farming activities on individual tenure system in the study area is productive.

Hypothesis Testing

The hypothesis which states that there is no significant difference in rice productivity of farmers on different land tenure system was tested using the Z - test statistics and the result is given below:

Table 9- Z – test Result for Comparing the Total Factor Productivity of Rice Farmers on Communal and Individual Land Tenure System.

	Communal Land Tenure	Individual Land Tenure
Mean	1.887619048	3.055862069
Variance	0.345239	0.373132
Observation	21	29
Hypothesized Difference	Mean 0	
Z	-6.824183189	
P(Z < =z) one-tail	4.42135E-12	
Z critical one- tail	1.644853627	
P(Z < =z) two-tail	8.8427E-12	
Z critical two- tail	1.959963985	

Source: Z – test Result, 2013.

The Table shows that the mean of communal and individual land tenure were 1.887619048 and 3.055862069 respectively. The variances were 0.345239 and 0.373132 respectively. The result of the Z – test statistics showed that absolute Zcal was 6.82 and Ztab or Zcritical was 1.96 (for a two-tailed test). The hypothesis was tested at 5% level of significance. This showed that the absolute Zcal > Ztab, that is 6.82 > 1.96. Therefore the null hypothesis which says there is no significant difference in rice productivity of rice farmers on different land tenure system (communal and individual) was rejected. This implies that rice farming activities on individual land tenure system is relatively more productive than rice farming activities on communal land tenure system.

CONCLUSION AND RECOMMENDATION

The results reveal that rice production on individual land tenure system is relatively more profitable and productive than on communal land tenure system. A very high productivity could be attained when the bottlenecks wrestling against high productivity is curtailed. In order to increase productivity and abundant returns by rice farmers and also fill the gap created by demand and supply of rice, the following recommendation is made: The ban of rice importation by the federal government should be strict and void of corruption so as to encourage local consumers' patronage of indigenous rice which in return will encourage indigenous farmers in terms of profit maximization and productivity. Farmers should form cooperatives or farmer groups to ensure greater access to agricultural credit facilities, improved seeds, fertilizers, extension services and loans which are now available for rice farmers in the country. This will help to reduce the incidence of insufficient capital involved in production.

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