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PRODUCTIVITY AND PROPERTY RIGHT TO LAND USE AMONG IFAD/VCDP RICE FARMERS IN GWER LOCAL GOVERNMENT AREA OF BENUE STATE OF NIGERIA

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ABSTRACT

The study assessed the productivity and property right to land use among IFAD/VCDP rice farmers in Gwer local government area, Benue State. A sample size of 120 farmers was collected through a cluster sampling technique using a pre-tested questionnaire. Descriptive statistics, total factor productivity (TFP), and Gross Margin Analysis (GM) were the tools for data analysis. Results of the data analysis show that the majority (69.2%) of the farmers acquired their lands by inheritance. Also, (79.8%) had controlling access to a piece of land and hence had land tenure security. Among these, 62.7% believed they could sell their rights to other individuals, 55.8% believed they could sell the land outrightly while 100.0% believed they could lease it. The average farm size for cultivation was 2.683ha and (53.3%) of the farmers had an average TFP value of 4.8981. Many (48.2%) farmers with the secured land tenure type had a TFP of 5.2207, a mean total variable cost of ₦279783.7838 and earned revenue of ₦1,054,918.92 with a mean GM of ₦775,135.13 which is rated at ₦288389.86/ ha. Conversely (64.9%) of farmers with the in-secured land tenure type had a TFP of 4.1745, a mean total variable cost of ₦24,1330.1205 and earned revenue of ₦1,167,409.64 with a mean GM of ₦926,079.51 which is rated at ₦359,993.17/ha. The t-test showed that there was an as significant difference in the TFP and GM of rice farmers between secure and insecure land tenure types. The constraints faced by the farmers are; Poor access to technological resources in terms of machinery and adverse weather factors. The study recommends that government should provide credit resources in form of inputs that should be supplied to farmers and extension information on weather issues as well as assist farmers with loans and another agricultural resource to enhance large scale production through mechanized farming.

Keywords: *property right to land use, total factor productivity, gross margin analysis*

INTRODUCTION

Agriculture accounts for over 70 per cent of the active labour force, and more than 23 per cent 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 and 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 (NPC, 2006); the larger part of which is poor and food insecure, with women and children most affected. The food produced, mostly at a subsistent level is inadequate due to low crop yield. FAO (1999) observed that the average crop yields for the African 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 an active and healthy life, in most parts of the African region

Since the mid-1970s, rice consumption in Nigeria has risen tremendously at about 10 per cent per annum due to changing consumer preferences. However, production has never been able to meet demand, leading to considerable imports which today stand at about one million metric tons yearly. The imports are procured in the world market with Nigeria spending about 356 billion naira in 2010 on rice imports alone. The inability of Nigeria's rice sub-sector to meet the domestic demand could be attributed to low productivity, inefficiency in the use of resources, disincentives from the macroeconomic environment and production being in the hands of small-scale farmers who use traditional technologies (Federal Ministry of Agriculture, 1995). Also, the shortfall in the supply of rice in Nigeria has been attributed to the continuous rise in per capita consumption brought about by increased population and rapid urbanization. (Akande *op cit*, 2001, Fabusoro and Agbonlahor, 2002).

It is a known fact that land is a basic natural resource as it supports most human activities and it is from it that most other economic resource is derived. It can neither be increased nor decreased therefore it must be judiciously and efficiently managed in a sustainable manner for the use and good of all. This, therefore, reveals why different countries the world over have evolved land tenure and land administration systems to administer their lands. (Oluwamotemi & David, 2010). The predominant land tenure system in Nigeria during the pre-colonial period was the customary land tenancy where land holdings were owned by villages, towns, communities and families. The land was deemed not owned by individuals but by communities and families in trust for all the family members (Omuojine, 1999). However, ownership of land often interferes with its use as an agricultural asset. The right of people to own, use and control land and its resources is known as the land tenure system. The indigenous land tenure in Nigeria is communal (Osemeobo, 1991). Land tenure systems influence the use to which land is put for economic and social development as land is the basis for every form of physical development and constitutes the primary medium for food (rice) production, the provision of shelter and utilities, the manufacture of goods and the establishment of institutions to support the basic needs of modern communities (Lasun and Olufemi, 2006).

According to Ben-Chendo and Joseph (2014), "Agricultural productivity is measured as the ratio of agricultural outputs to agricultural inputs. Therefore, the output is usually measured as the market value of the 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

The main theories behind this study are the property rights theory and the production theory. Property rights theory does not emphasize who owns the land but rather analyzes the formal and informal provisions that determine who has a right to enjoy benefit streams that emerge from the use of assets and who have no such rights (Libecap, 1989; Eggertsson, 1990; Bromley, 1991). Thus, property rights involve a relationship between the right holder, others, and a governance structure to back up the claim. According to the United Nations Centre for Human Settlements (UNCHS, 2004), there exists a close relationship between land tenure and property rights. The main justification for secure property rights to land is that it is providing the incentives for investment in land and sustainable development.

Benue State is one of the leading rice producers in Nigeria and the study area has a favourable climatic condition for rice production. Against this backdrop, it's imperative to investigate the impact of the Right to Land Use on the productivity of rice farmers for purpose of optimizing its production. In an economy, where land resources are scarce and free access is lacking, this study can show the possible increment in output as a result of an increase in the cultivable landed resource base of farmers.

METHODOLOGY

The study area for this research was Gwer Local Government Area in Benue State, Middle belt Nigeria. Its name was derived from the Gwer river located in Benue state; with a land mass of 2,294Km^2 and a population of about 163, 647 at the 2006 census. It is headquartered in Aliade; bearing seventeen (17) council wards and occupying an area of about 80 – 90east of the Greenwich meridian. Also, the state lies within the AW climate and experiences two distinct seasons; the wet season and the dry season. The rainy season lasts from April to October with annual rainfall in the range of 100-200mm and the climate of the area is characterized by relatively high temperatures throughout the year with the average annual maximum temperature varying between 35ºC - 31ºC throughout the year while the average annual minimum temperature is between 23ºC - 20ºC (FAO, 2001). Agriculture employs a larger percentage of the working population in the area, but agricultural landholdings are generally small. The average number of farm plots per household ranges from 3 to 30 plots and between 0.4 and 4.0 ha (FAO, 2002). The predominant form of crop husbandry in this region is the rain-fed cultivation of annual crops.

The population for this study consists of all farming households in Gwer Local Government Area. A sample size of 120 respondents was selected using the cluster sampling technique. The data were analyzed using descriptive statistics, total factor productivity and gross margin analysis. The descriptive statistics used include Percentages, Mean and Frequency distribution.

Table 1: Descriptive Statistics of Farm and Farmer-specific Characteristics

Variable	Frequency	Percent	Mean
Age			**45.60 (10.796)**
≤ 20	01	.8	
21 – 40	41	34.2	
41 – 60	68	56.7	
61+	10	08.3	
Sex			
Female	35	29.2	
Male	85	70.8	
Marital status			
Single	09	07.5	
Married	111	92.5	
Level of education			
No formal education	08	6.7	
Primary	34	28.3	
Secondary	57	47.5	
Tertiary	21	17.5	
Farming experience			**9.89 (5.674)**
≤5	25	20.8	
6 – 15	78	65.0	
16 – 25	15	12.5	
26+	02	01.7	
Family size			**6.050 (2.7496)**
≤ 5.0	52	43.3	
6.0 - 10.0	59	49.2	
11.0 - 15.0	09	07.5	
Farm size per hectare			**2.683 (1.1666)**
≤1.0	06	5.0	
2.0 - 2.0	61	50.8	
3.0 - 3.0	30	25.0	
4.0+	23	19.2	
Access to credit	102	85.0	
Access to non-farm income	81	67.5	**0.68 (0.470)**
Member of a cooperative	120	100.0	
Access to extension agent/service	120	100.0	

Note: Values in parentheses represent standard deviation
Source: Computed Field survey data, 2021

Total factor productivity (TFC)

The product information of the data is used to determine the total factor productivity and is expressed as the ratio of total output to input. (Pfeiffer, 2003).

$$TFP = \frac{\text{Total Output}}{\text{Total Input}}$$

Gross Margin Analysis (GM)

"Gross Margin Analysis (GM) is the difference between the Gross Income and Total Variable Cost was used because it is the preferred method of determining the profitability of subsistence farm enterprises in which fixed capital is negligible." (Kudi, Yakubu, & Nasa'i, 2010).

GM = GFI – TVC

Where;

GM = Gross Margin (₦/ha)

GFI = Gross Farm Income (₦/ha)

TVC = Total Variable Cost (₦/ha)

The summary statistics of Farmer's Land and security of land property in Table 2 showed that the land tenure system in the study area was predominantly (69.2%) through inheritance. This result is similar to Tsue (2015) where the majority (47.5%) of the respondents in north-central Nigeria indicated that they owned a piece of land by inheritance. This implied that private ownership (inheritance) of rice farmland was predominant in the study area. This could enhance credit access and investment. Ownership and control of land and related resources are often associated with influence in decision making and power to affect outcomes according to Tsue (2015). Bamire (2010) also found that "farmland acquisition through inheritance was predominant in the dry savannas of Northern Nigeria." Rugege *et'al.* (2007) asserted that land tenure was a key factor in any economy since it conferred property rights and defined access to and control over land assets, including natural resources that existed in or on the land. Additionally, it conferred rights in relation to the manner in which people own, occupy and transact land. This also entails decisions pertaining to residential and business development, agricultural production and mining, and the use of other natural resources. This then informs the idea of land rights which are largely exercised on the basis of the level of security an individual is granted over a land.

Table 2: Percentage distribution of land tenure characteristics of rice farmers (n=120)

Variable	Frequency	Percent
Tenure type		
Inherited	83	69.2
Rent	37	30.8

Source: Computed from field survey data, 2021

The summary statistic in Table 3 reveals that; 83 of the respondents (69.2%) secured their lands through the inheritance tenure type. This implies that they had controlling access (security) to the piece of land. Out of this, 62.7% assert that they could sell their rights to other individuals in exchange for money; the other 37.3% opined that they had no rights to sell the land. The inability to sell land outrightly by respondents indicated the ineffective and weak property rights (insecurity) to land. Furthermore, all of the respondents (100%) who owned or had land tenure security reported that they could lease it out if they so wished. This result is similar to Tsue (2015) who found that the majority (62.9%) of the respondents had the right to lease off their land. The result also revealed that a majority (78.3) of respondents who had land tenure security reported that they could transfer and confer ownership of the land to anyone as they may wish. This is similar to Tsue (2015) where the majority (53.7%) of the respondents had a land transfer right.

The stability of tenure is very important for farmers to invest in land development and management practices for agricultural production. Secure individual rights over land lead to higher levels of labour and management effort, which in turn encourages higher levels of investment to protect or enhance land fertility (Feder & Feeny, 1991). In the area of agriculture, Feder *et al.* (1988) illustrated that increased tenure security was expected to enhance the productivity of farmers through the intensification effect, which reflected the effects of land tenure security on the incentives to invest, particularly in capital goods attached to the land. First, if the farmer believed that he would be allowed to reap the long-term benefits of current investments, investment levels were likely to increase relative to a situation where there was tenure insecurity. Access to land without sufficient security is of little use to investors, who need secured long term property rights as collateral for bank facilities.

The result of this study also confirmed a study by Kim and Muhammad (2013), where 50% of the farmers in Agatu Local Government Area had freehold predominance hence more tenure security. These freeholders engage in tree crop production and fishery due to the fact that freeholders have more security of tenure which induces long term agricultural investment.

Table 3: Percentage distribution of land rights of rice farmers in secure and insecure tenure forms

(n=120)

Land rights	Pooled		Secure		Insecure	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Sell rights	67	55.8	31	37.3	00	100
Transfer rights	65	54.2	65	78.3	00	100
Lease right	83	69.2	83	100.0	00	100

Source: Computed from field survey data, 2021

The productivity of rice farmers was measured using Total factor productivity (TFP). The Productivity of rice farmers in secure and insecure land rights in table 4 indicates that the majority (53.3%) of the rice farmers with IFAD/VCDP had an average total factor productivity value of 4.8981 having incurred a total factor cost ranging from 2.01-5.00. Further statistics, however, show that (48.2%) of individual farmers with the secured land tenure type had average total factor productivity of 5.2207 and the majority (64.9%) of the farmers with the insecure land tenure type had average total factor productivity of 4.1745. This showed that the rice farmers with secure land rights had higher productivity than the ones with insecure rights.

This was confirmed by a t-test of the difference shown in table 4. The result showed that there was a significant difference ($t=2.74$, $p<0.01$) in the productivity between farmers who had secure land rights and those who had insecure rights at the 1% level. This implied that the farmers with secure land property rights had higher productivity than those with insecure rights. This might be owing to the fact that farmers with secured land tenure type or property right usually incur less cost in terms of obtaining and utilizing spans of land that are readily available for rice cultivation as may be compared with farmers with the insecure land type who own land through rent. This negates the result of Kim and Muhammad, (2013) who stated that farmers who rent (insecure tenure type) land in Agatu Local Government Area of Benue state have more yield than those with freehold (secure tenure type).

Table 4: Productivity distribution of rice farmers in secure and insecure land rights (n=120)

Variable	Pooled		Secure		Insecure	
	Frequency	percent	Frequency	Percent	Frequency	Percent
TFC						
≤ 2.00	02	01.7	01	01.2	01	02.7
2.01 - 5.00	64	53.3	40	48.2	24	64.9
5.01 - 8.00	43	35.8	31	37.3	12	32.4
8.01+	11	9.2	11	13.3		
Mean 4.8981 (1.98107)		5.2207 (1.94214)		4.1745 (1.89827)		
t-test = -2.744		df = 118		Sig. = .007		

Note: Values in parentheses represent standard deviation
Source: Computed from field survey data, 2021

The summary statistics of the Cost and Return Variables of Rice Farmers in the study area are presented in table 5. The result indicated that the mean total variable cost incurred was ₦253186.67 and from this value individuals with secure land tenure type and the insecure land tenure type incurred mean variable costs of ₦279,783.78 and ₦241,330.12 respectively. The table reveals that the mean revenue was ₦1,132,725.00 which means that on average a rice farmer obtained a gross margin of ₦879,538.33 which is at ₦337,915.49/ha. Consequently, the mean revenue of a farmer with a secured land tenure type is ₦1,054,918.92 and as such obtains a mean gross margin of ₦775,135.13 which is rated at ₦288,389.86/ha. Conversely, the mean revenue of a farmer with an insecure land tenure type is ₦1,167,409.64 and as such obtains a mean gross margin of ₦926,079.51 which is rated at ₦359,993.17/ha.

The result of the gross margin analysis as presented in table 5 indicates that the mean total revenue obtained by a farmer with IFAD/VCDP was higher than the mean total variable cost. This result shows that rice production in Gwer LGA of Benue state is a lucrative business and it could be concluded therefore that rice farming is profitable. The implication of this result is that a farmer with land tenure security realizes an average gross margin value of ₦288,389.86 which is higher in value compared to one with land tenure insecurity who records an average gross margin value of ₦359,993.17. Hence, a rice farmer with IFAD/VCDP averagely realizes a gross margin of ₦337,915.48 for each hectare committed to rice production. The result of the t-test also showed a significant difference ($t=2.936$, $p<0.01$) in the gross margin between farmers with secure and insecure land property rights.

Table 5: Descriptive statistics of cost and return variables of rice farmers in the study area (n=120)

Variables	Pooled (Mean) (₦)	Secure land tenure (mean) (₦)	Insecure land tenure (mean) (₦)
Cost of rent	7,225.00	23,000.00	192.77
Cost of seed	53,333.33	55,405.41	52,409.64
Cost of fertilizer	97,050.83	101,783.78	94,940.96
Cost of herbicide	15,910.00	16,270.27	15,749.40
Cost of tractor	1,625.97	1,217.19	1,808.19
Cost of plough	29,991.67	33,324.32	28,506.02
Cost of planting	6,558.33	4,864.86	7,313.25
Cost of fertilizer application	1,004.17	972.97	1,018.07
Cost of herbicide application	1,405.00	1,189.19	1,501.20
Cost of harvesting	39,083.33	41,756.76	37,891.57
TVC	253,186.6667	279,783.7838	241,330.1205
Total revenue	1,132,725.00	1,054,918.92	1,167,409.64
Gross margin	879,538.3333	775,135.1351	926,079.5181
Gross margin per ha	337,915.4861	288,389.8649	359,993.1727
t-stat = -2.936	df = 118	Sig. = .006	

Note: Values in parentheses represent standard deviation Source: Computed from field survey data, 2021

CONCLUSION AND RECOMMENDATION

The study concludes that rice farmer productivity in the study area was high and as such could be considered profitable. The key socioeconomic factors that affect rice production in the study area were age, farming experience, farm size, access to credit and land tenure security. Major constraints faced by rice farmers in the study area were a lack of access to technological facilities for mechanized farming and weather factors. Also, the tenure right is a major barrier to the development of agriculture in the study area and to solve the problem, it would sound logical to propose a strategy whereby available land is fairly distributed among the IFAD/VCDP farmers and that would be through the land tenure reformation and land consolidation method. The study recommends that the number of credit resources in form of inputs supplied to farmers should be increased, extension information on weather issues should be made readily available and accessible to the farmers and the Government is enjoined to assist the farmers with loans and other agricultural resources to enhance large scale production through mechanized farming.

CONFLICT OF INTEREST

The authors of the paper declare no conflict of interest

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