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FARM PRODUCTIVITY ANALYSIS AND RETURNS FROM DIFFERENT CLASSES OF LAND SIZE HOLDINGS IN IMO STATE, NIGERIA

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ABSTRACT

This study evaluated the farm productivity and returns from different classes of land size holdings in Imo State, Nigeria. Multi-stage random sampling technique was used to select 75 farmers for the study. Information was elicited from the sampled respondents through a structured questionnaire and interview schedule. Data were analyzed using descriptive statistics, partial productivity index of land, and net returns model. The socio-economic features of the farmers reveal a mean age of 58 years, 12 years educational attainment, 5 persons per household, 15 years farming experience, and a mean farm size of 1.07ha. The total returns from these zones showed that Owerri zone recorded the highest total returns of ₦290,878.2/ha with a land productivity of ₦49,258/ha which is higher when compared to other zones. Orlu zone had a total return of ₦227,227.4/ha with a land productivity of ₦45,454.6/ha and while Okigwe zone showed least returns of ₦197,553.1/ha with a land productivity of ₦39,510.63/ha. This implies that farmers in Owerri zone efficiently utilize the resources available to them which resulted to higher outputs and productivity relative to other two zones. The result further indicated that Owerri zone had the highest net returns of ₦73,628 followed by Orlu, ₦65,140 while Okigwe zone had the least returns of ₦52,390. Hence farmers in the area are encouraged to adopt good land management techniques,

thus this improves farm output and farm productivity and also raises farm income.

Keywords: Farm Productivity; Analysis; Net-Returns; Land Size Holdings; Imo State

INTRODUCTION

In classical economics, factors of production are predominantly land, labour, capital and entrepreneurship. According to Benjamin (1995) land provides the major natural resources used by man and also provides space for building and construction. Though it may be scarce, fixed and immobile, it is a major factor of agricultural production (Weersink et al. 1999). It has a derived demand given the fact that it is demanded for solid, liquid and gaseous minerals it contains. Again, land is usually elastic given that it has many alternative uses such as farming, road construction, mining, buildings and other uses such as recreation, religious and cultural (Palmquist, 1989). Land as a factor of production has a permanent value thus, it appreciates in value overtime and these values have continued to rise, thereby making it more important than other factors of production (Miranowski and Cochran, 1993). Land is therefore, the most crucial resource that accommodated agricultural activities like pre-planting, planting and post-planting operations as well as livestock production. Land prices are differentiated on the basis of its production attributes in agriculture as well as other activities (Duvivier et al. 2005).

In rural areas, where agricultural production dominates economic activities, land is of higher use, hence attracts higher values. However, the value of land is not influenced by its demand for constructions, building and urban development. Moreover, the potential returns from agricultural activities are capitalized into current farmland prices (Folland and Hough, 1991) with other variables reflecting the economic returns to agriculture.

In some studies land values have been estimated through the influence of returns to agriculture (Devadoss and Manchu, 2007). In recent times, returns from lands have depreciated due to unsustainable land practices used by farmers' overtime. Farmers in a bid to maximize productivity and income use variant land practices which is concomitant to soil erosion, leaching, desertification, deterioration, thus threatening farm productivity of the farmers (Osuji, 2017). Ideally, productivity growth in the agricultural sector is considered important if the sector is to improve at a rate equal to or greater than the population growth rate to meet the demand for food and raw materials. Also, productivity performance in the agricultural sector is critical to improvement in the economic well being of the entire country (Alabi, 2005). The general decline in agricultural productivity has translated into gross incapacitation of the sector in meeting the rising food demand and by extension led to perennial for instance food shortages, soaring food prices and massive importation (Imodu, 2005; Onyenweaku and Nwaru, 2005). Tanko et al. (2006) averred that Nigeria's food deficient situation has been worsened by declining farm productivity owing to inefficient production techniques, poor resource base and declining soil productivity among other factors.

MATERIALS AND METHODS

This study was carried out in Imo State, Nigeria. The State is located in the South-Eastern rainforest belt of Nigeria. Imo State has a total of 27 Local Government Areas which is divided into 3 Agricultural Zones namely; Owerri, Orlu and Okigwe. Across these zones, agriculture is a major economic activity predominant amongst the people of the State. A multiple-stage random sampling technique was adopted in selecting the sample. Three local government areas (LGAs), one from each of the agricultural zone, were selected using simple random sampling to get a representative sample of the State. From each LGA, 3 communities were randomly selected. The list of arable crop farmers in each chosen community forms the sampling frame. The list had farmers who cultivated on inherited or leased

and rented farmlands from which 10 crop farmers were selected making a total of 90 farmers. Out of these only 75 farmers were found useful for data analysis. Data collected using structured questionnaire and interview schedule were analyzed using descriptive statistical tools, partial productivity index of land, and net returns model. The partial productivity index of land model is explicitly specified as follows;

$P = Q_i/X_i$ ----------Eqn.1

Where:

P = Partial productivity index of land

Q_i = Quantity of output produced from an ith class of land (Naira)

X_i = Total rent and cost of land improvement of ith class of land (Naira)

Productivity of land was estimated based on land size holdings of the ith farmers sampled. (Just and Miranowski, 1993).

The net returns model is generally specified as follows;

NR = TR – TC ……Eqn.2

Where:

NR = Net returns

TR = Total revenue

TC = Total cost (TFC + TVC)

TFC = Total fixed cost

TVC = Total variables cost

The Total revenue (TR) is expressed as P_qQ_i ……Eqn.3

Where P_q is the unit price per produce while Q_i is the total quantity sold by a marketer in the area.

Total fixed cost (TFC) = ΣK_i ……Eqn.4

Where K_i represent fixed cost (depreciation; rent, etc)

Total variable cost (TVC) = ΣP_iX_i ……Eqn.5

Where P_i to P_n represent the unit price of inputs used, X_i to X_n are the corresponding inputs such as labour, seeds and others including cost of transportation.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Respondents

The socio-economic characteristics of the respondents are shown in Table 1 below. The mean age of the respondents was 58 years. It implies that the farmers were beyond their active stage of life to produce the needed quantities of output. It is generally believed that farmers output and productivity diminishes with advancing age. At this age farmers are growing weaker and as such loss of farming strength which declines maximum output. This finding agrees with Osuji (2017) and contradicts Lence and Mishra (2003) who reported that farmers at this age are more knowledgeable enough to scale through farm production constraints and have acquired enough farming experience to increase farm production in a short time. The mean education level was 12 years and this implies that the farmers attended up to secondary school which qualifies them to take critical decision concerning their farming enterprises. This further implies that the farmers were better positioned to take advantage of new innovation techniques that could boost their farming. The result agrees with Latruffe and Ch. Le Mouel (2009), assertion who stated that improved education level brings about positive changes in the knowledge, attitude and skills through research and extension. Educational attainment does not only raise agricultural productivity but also enhance farmer's ability to understand and evaluate information on new techniques. This supports the finding of Nelson and Kennedy (2009).

The mean household size was 5.0 which fall within the range of 6-10. This is desirable and of great importance to rural household as they rely more on their family members than hired laborers in their farming, thereby reducing production cost. This finding is consistent with Osuji (2017). The mean farming experience was 15.4 years which implies that the farmers were relatively experienced to carry on with their production activities. According to Ekanem et al. (2015) the years of farming experience of a farmer enables him to acquire practical and relevant farming knowledge which drive his ability to

efficiently utilize available resources with discretion. The mean of the farm size was 1.07. This implies that farmers in the area operated small farm sizes which have an inverse relationship on productivity of the farm. This further implies that most of the farmers were operating on subsistence level. This might not be unconnected with the difficulty in acquiring land for farming purposes. Studies have shown that most rural farmers in Nigeria operated on small scale basis (Gardner et al. 2008).

Table 1: Socio-Economic Characteristics of the Respondents

Variable	Mean
Age (years)	58
Education (years)	12
Household size (No of persons)	5
Farming experience (years)	15.4
Farm size	1.07

Source: Field Survey, 2014

Productivity of the Different Classes of Land Size Holdings in Imo State

The Productivity of the Different Classes of Land Size Holdings is shown in Table 2 below. The result shows that the returns on cassava and yam in Owerri and Okigwe Zones were higher than the returns in Orlu zone. Owerri and Okigwe zones showed a value of ₦84,674.4 and ₦89,824.8 on cassava relative to Orlu zone that has a value of ₦72,840. This implies that these zones had a good soil which is very fertile for the growth of these crops in the area. This is consistent with the findings of Ehirim et al. (2013). Orlu zone has a higher return on vegetable production when compared with other zones. Orlu zone has a value of ₦77,340 while Owerri and Okigwe zones recorded lower values of ₦11,200 and ₦32,184.8 respectively. This implies that farmers in Orlu zone have technical expertise and experience in vegetable crop production. This agrees with the findings of Osuji (2011). Again farmers in Owerri zone recorded higher values in Maize and Melon production compared with other zones. This further implies that farmers in Owerri zone put

into good use research services got from extension agents. Extension services are known to engender higher outputs if a farmer adheres to the instructions given. This corroborates with the findings of Osuji (2017). The total returns from these zones showed that Owerri zone recorded the highest total returns of ₦290, 878.2/ha with a land productivity of ₦49,258/ha which is higher when compared to other zones. Orlu zone had a total return of ₦227,227.4/ha with a land productivity of ₦45,454.6/ha and while Okigwe zone showed least returns of ₦197,553.1/ha with a land productivity of ₦39,510.63/ha. This implies that farmers in Owerri zone were able to efficiently utilize the resources available to them with utmost discretion which resulted to higher outputs and productivity relative to other two zones. This is also consistent with the findings of Osuji et al. (2012) who reported that efficient utilization of inputs induces higher yields and productivity of the farm. Again, the mean returns and mean farm sizes across the various zones further affirms that Owerri zone has upper hand in terms of output and farm productivity. The results reveals that Owerri zone recorded a mean value of ₦56, 110.88/ha and farm size of 1.36/ha which was also higher in relative with other zones. This further implies that increase in farm size plays a major role in the productivity of the farmers Ehirim et al. (2013).

Table 2: Productivity of the Different Classes of Land Size Holdings

Variables (Ha/farmer)	Owerri zone ₦ (Ha/farmer)	Orlu zone ₦ (Ha/farmer)	Okigwe zone ₦ (Ha/farmer)
Returns			
Cassava	84,674.4	72,840	89,824.8
Yam	114,680	14,104.18	72,184.8
Vegetables	11,200	77,340	32,184.8
Maize	115,040	70,544.8	35,944.8
Melon	70,000	1,534.3	14,826.7
Total returns	290,878.2	227,227.4	197,553.1
Mean returns	56,110.88	47,272.78	48,993.18
Land productivity	49,258	45,454.6	39,510.63
Mean farm size	1.36Ha	1.04Ha	1.24Ha

Source: Field Survey, 2014.

Net Returns from Different Classes of Land Size Holdings in Imo State

The net returns from different classes of land size holdings are shown in Table 3 below. The Table showed further that Owerri zone recorded the highest total revenue with a corresponding output in kilogram of crops produced across the zones. The result reveals that Owerri zone has a value of 5,944kg in comparison with Orlu and Okigwe zones with values of 4,960kg and 3,820kg respectively. This implies that Owerri zone has technically efficient farmers who maximize output with available inputs. This result is consistent with the findings of Osuji et al. (2014) and further corresponds with the result in (Table 1) above which showed Owerri zone having whip hand over other zones. It could be further deduced that Orlu zone had an aggregate variable cost of ₦200,380 which marginally differs from that obtained in Okigwe zone with over 74 percent increase in Owerri zone. Furthermore, it was found that the fixed cost in Owerri zone is higher than that of Orlu and Okigwe zones. It has been argued that large fixed cost becomes a constraint to technology adoption (Featherstone and Baker, 1988) especially of

the technology that requires a substantial amount of initial set-up cost called "lumpy technology" Goodwin et al. (2003). The result further indicated that Owerri zone had the highest net returns of ₦73,628 followed by Orlu, ₦65,140 while Okigwe zone had the least returns of ₦52,390. This further implies that Owerri zone had better soils with the farmers engaging in good land management practices which increase the quality of soils thereby resulting to higher yields and income. This agrees with the findings of Ehirim et al. (2013)

Table 3: Net Returns from Different Classes of Land Size Holdings

Variable (Ha/farmer)	Owerri zone ₦ (Ha/farmer)	Orlu zone ₦ (Ha/farmer)	Okigwe zone ₦ (Ha/farmer)
Quantity produced (kg)	5944	4960	3820
Total revenue	374400	296000	282000
Variable cost			
Cost of labour	28,800	15,656	20,500
Other cost (Aggregate)	268212	200380	200110
Fixed cost			
Depreciation of fixed inputs	10320	9200	7400
Other cost (Aggregate)	32560	30 480	29500
Total cost	300772	230860	229610
Net returns	73628	65140	52390

Source: Field Survey, 2014.

CONCLUSION AND RECOMMENDATIONS

The productivity of the farmers has continued to decline due to variant land management practices engaged by the farmers. Farm size, to a large extent determines the productivity and output of the farmers in the long run. The findings of the study showed that farmers' mean farm size was low and this implies that farmers in the area operated small farm sizes which have an inverse relationship on the productivity of the farm as well as their income. The result shows that the returns on cassava and yam in Owerri and Okigwe Zones were higher than the returns in Orlu zone. This implies that

these zones had a good soil which is very fertile for growing crops in the area. The total returns from these zones showed that Owerri zone recorded the highest total returns in comparison to other zones. The result further indicated that Owerri zone had the highest net returns followed by Orlu, while Okigwe zone had the least returns. Hence farmers in the area are encouraged to adopt good land management techniques thus; this improves farm output and productivity and also raises farm income.

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