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Foreign Direct Investment in Nigeria; Efficiency Differentials of Foreign and Local Farms in Edu Local Government Area of Kwara State

[1]J.J. Musa, [1]O. Chukwu and [2]S. Bello
[1]Department of Agricultural Engineering, Federal University of Technology,
P.M.B 65, Minna, Niger State, Nigeria
[2]Department of Agriculture and Extension Services, University of Ilorin,
P.M.B 1515, Ilorin, Kwara State, Nigeria

Abstract: The relationship between agricultural investments in terms of inflows from Foreign Direct Investment (FDI) and Agricultural productivity in Nigeria cannot be over emphasized. Productive Performances of the New Nigerian farmers were measured vis-a vis communal farming in Edu Local Government of Kwara State. The entire 15 foreign commercial farmers present in the area were enumerated, while for the local farmers, the first stage sampling involved the random sampling of 6 villages constituting the displaced and non-displaced farmers surrounding the foreign initiated farms. Most of the displaced communities have been adequately relocated and compensated. From each of these 6 villages a random sample of 15 farmers was selected to make a total sample size of 90 local farmers. This research dealt with those farmers who planted rice, maize, yam and melon. It was discovered that 82% of the farmers planted maize, 76% planted yam, 60% planted rice and 78% planted melon. On the other hand, 80, 40, 70, 30 and 40% of the foreign farmers planted maize, groundnut, soya beans, cowpea and rice, respectively. From the study, the mean output of communal farming is 5,511MJ/15,000 kg per annum with minimum and maximum values of 874 and 12,722MJ/15,000 kg per annum. This figures when compared with the mean, minimum and maximum values of the Nigeria farmers on the basis of output in MJ/ha/annum is larger and thus attributed to number of cropping seasons practiced in communal farming.

Key words: Foreign, investment, goals, investors, efficiency, inputs, outputs

INTRODUCTION

Despite the immense natural wealth and emphasis that have over the years been placed on revitalizing agriculture by successive Governments, Nigeria remains poor, the economy is still one of the weakest in the world; the production of food has not matched the increasing population. As food production increases at the rate of 2-2.5%, the demand for food increases at a rate of more than 3.5% due to the population growth of 2.83-3% (Nyako, 2006). The apparent disparity in the rate of food production and demand for food in Nigeria has led to food demand-supply gap, thus, leading to a widening gap between domestic food and total food requirement, an increasing resort to food importation and high rates of increase in food prices, all these culminating into poverty, hunger, starvation and food insecurity. The Federal Government of Nigeria, recently, expressed fears that if the present trend continues it may become almost impossible to meet the Millennium Development Goals (MDGs) (Obasanjo, 2004). In a recent report, the World Bank described Nigeria as being among the poorest nations on earth with the majority of its people (i.e., over 80%) entangled in poverty living on less than the equivalent of a dollar per day (Nyako, 2006). It is pertinent to note that the proportion of the poor has doubled over the last two decades in spite of the, oil export earning of about $300.00 billion since the mid 1970s, average income in 2000 was 20% lower than 1975.

As a result of the widespread inability to produce adequate food in Nigeria and in most Less Developed Countries (LDCs), the government of Nigeria like most of these countries have embarked on numerous agricultural development strategies since, the 1960s, such as Operation Feed the Nation (OFN), the Green Revolution, National Economic Empowerment and Development Strategies (NEEDS), National Poverty Eradication Programme (NAPEP) to mention but a few. Although, these strategies were initiated with good intentions, however, the all-too-familiar picture (that of an ever worsening food security situation) still persists.

Corresponding Author: O. Chukwu, Department of Agricultural Engineering, Federal University of Technology, P.M.B 65, Minna, Niger State, Nigeria

Several problems have been identified with these technological intervention programmes, such problem as the emphasis being placed on technology transfer without eliminating the structural obstacles (e.g., land tenure) facing peasants in 1950s and 1970s. Furthermore, the skills needed to manage these technologies were found to be tied to the suppliers rather than to the beneficiaries (peasants) and at times they created situations of income disparity and socio-economic inequalities to make mention of a few (Molnar Clonts, 1983; Hayami and Ruttan, 1985; Stevens and Jabara, 1988).

Moreover, several researchers Aitken *et al.* (1997) have documented studies on production efficiencies of peasants in Less Developed Countries (LDCs) with most of these studies attempting to characterize the behaviour of peasants. These studies assumed ideal socio-economic environments such as appropriate marketing policies, adequate infrastructure, access to technologies and other inputs. The results portray peasant's behaviour in various ways, for some, the behaviour of peasants is static, largely because they are not innovative or efficient, while a few others, believe they are efficient and signs of inefficiencies are as a result of the static environment in which they are operate (Aitken and Harrison, 1999). Yet, there are numerous studies, which convincingly argue that peasants are efficient, that their goals, strategies and decisions are logical and rational given the constraints and choices they face (Schultz, 1964).

The new partnership for Africa's Development (NEPAD) and other proponents of FDI perceive FDI as a key resource for the translation of NEPAD's vision of growth and development into sustainable growth by eliminating current global level of poverty. However, it has been noted that, while the FDI regime in Nigeria is improving, serious deficiencies still remain. The persistent political and institutional uncertainty in the country they inferred was discouraging FDI and trade flows outside the oil sector. They also posited that the legal and judicial systems were inadequate to support the needs of new investors into other sectors of the economy.

It was also reported that the FDI in Nigeria showed a great deal of sensitivity to changes in domestic investment, domestic output or market size, indigenization policy and changes in the openness of the economy and hence, the absorptive capacities of developing countries were found to be important determinants of the structure of FDI. However, this concept when transposed into the Nigerian agrarian situation reflects that attempts at putting in place certain measures and policies have been taken to increase the countries absorptive capacity. This perhaps must have informed the decision of the Kwara State Government in pioneering efforts of inviting foreign direct investment in the realm of agriculture as shown by the invitation of commercial farmers from Zimbabwe to Nigeria. The initiative, it is understood would complement the policy thrust of strengthening the macro-environment to stimulate greater private sector investment in agriculture so that it can assume its appropriate role as lead and main actor in the economy.

One of such steps taken that has attracted interest, is the encouragement that has been given to foreign direct investment in the area of agriculture. FDI has been posited as one of the most important solutions to economic problems in most less developed countries (Bengoa and Sanchez-Robles, 2003; Akinlo, 2004). Moreover, in recent times, the many developing economies of the world have come to regard Foreign Direct Investment (FDI) as an important form of agricultural financing with a promising path towards increased agricultural productivity and overall economic growth and development. Although, it is important to state that debates still go on as regards the efficacy of FDI as a major source of financing in agriculture, it would seem difficult for even most economists to completely disregard the potential benefits of FDI.

Some policy analysts have argued that the indigenization policy of a 40% foreign equity holdings participation allowance enforced by successive regimes in Nigeria, has been the cause in decline of both private and foreign investments, reduction in the long-run of levels of per capita consumption and entirely slowed down the growth and economic development. However, upholding a contrary view, are those who believe that a foreign controlled economy might endanger domestic production and discourage the development of a most suitable indigenous technology which is likely on the long run to further aggravate the persistent problems of poverty, disease and hunger that plague our nation.

The combined foreign initiated commercial farms i.e., the New Nigerian Farms (NNF) have a capacity of approximately 15,000 ha of farm land. Edu Local Government Area is located in the Northern part of the State, while the Shonga district lies to the East of the Local Government Area. Edu falls in the geographical location of 8°30'-9°00'N and longitude 5°00'-6°20'E. Agricultural production is favoured in the North-eastern part of the State due to the naturally fertile land of the flood plain of River Niger that stretches from Jebba/Bacita through Shonga in Edu to Gakpan in Pategi L.G.A of the State.

The broad objective of this study is to examine and analyze the productive performances of foreign and domestic farms in the study area. Other objectives are to determine the technical, allocative, economic and energy

efficiencies of both farm groups to establish the differentials in production efficiencies that exist between the two farm groups, to analyze the determinants of the various inefficiencies that exit, to determine and compare the cost and returns of both farm groups and to investigate the socio-economic consequences of the acquisition of local lands by foreign farmers.

MATERIALS AND METHODS

Description of the area: Kwara State was created in 1967, it falls within the latitude 7°55'N and Longitude 2°20'E, having a total land area of 32500 Km^2. The State is made up of 16 Local Government Areas (LGA) and shares boundaries with Oyo, Osun, Ekiti, Niger and Kogi States. The State is also characterized by two distinct seasons, that is, the wet and dry seasons. This study was conducted in Shonga community of Edu Local Government Area of Kwara State. This is mainly because the foreign initiated commercial farms are situated in this community. It should also be noted that as at the time of conducting this research, this community is the only known community in Nigeria that has such commercial farms of large magnitude.

The entire 15 foreign commercial farmers present in the study area were enumerated, while for the local farmers, the first stage sampling involved the random sampling of 6 villages constituting the displaced non displaced farmers surrounding the foreign initiated farms in the study area. It is important to note that most of the displaced communities have been adequately relocated and compensated. From each of these 6 villages a random sample of 15 farmers was selected to make a total sample size of 90 local farmers.

Primary data as well as secondary data were adopted. The primary data involved the administration of both a well structured questionnaire for local farmers and an interview schedule for foreign farmers. The study was based on comparison of productivity performance of both commercial farmers and local farmers in the 2006 cropping season. The data collected for local farmers generally covered both displaced and non-displaced farmers in the study area.

Data collected were analyzed and compared using descriptive statistics; such as mean, mode, percentiles and range. Econometric tools such as correlation techniques, regression and stochastic frontier and the Data Envelopment Analysis (DEA) were used in analyzing the productive performance of both farm groups. Other analytical tools used are energy efficiency, farm budget analysis. These are used in analyzing the energy efficiency ratios and gross margins, respectively of both farm groups. The DEA method was used to determine the technical, allocative and overall cost/economic efficiencies of the two farm groups, while energy ratio measures were adopted in determining energy efficiencies of the farm. In using the DEA method to solve for the technical, allocative and economic efficiencies, the price information was supplied with the view of solving for cost minimization.

Energy efficiency estimates were measured as a ratio of energy output of the production to input energy, which is defined as a form of energy value of outputs and energy value of the sum of all direct and indirect inputs. Therefore,

$$\text{Energy ratio} = \frac{\text{Total energy output}\left(\text{MJ ha}^{-1}\right)}{\text{Total energy input}\left(\text{MJ ha}^{-1}\right)}$$

where:

Total energy output (MJ ha^{-1}) = sum of energy equivalents of yield.

Total energy input (MJ ha^{-1}) = energy input in farm operations (MJ ha^{-1}).

The Stochastic frontier function was used to establish the differentials in in-efficiencies in production of both farm groups. The Cobb Douglas and trans-log production function specified were adapted from the research of Coelli (1995).

The frontier functions (production and cost) are estimated through maximum likelihood methods. For this study, the computer programme FRONTIER version 4.1 was used. However, it should be noted that this computer programme estimates the Cost Efficiency (CE).

Analyses of efficiency indexes: Based on the cost frontier function the average Technical Efficiency (TE), Allocative Efficiency (AE) and Economic Efficiency (EE) indexes are required for comparison among both farm groups and would be computed.

The technically efficient input vector (X_n) for a given output level is derived by solving simultaneously Y= f (X) and the input ratios (Bravo-uretra and Pinheiro, 1997; Rahji, 2003). Therefore, Economic, Allocative and Technical Efficiencies indices are derivable directly using frontier production function (Taylor, 1986; Sharma *et al*., 1999; Rahji, 2005).

TE and EE can be calculated using cost measures as follows:

$$\text{Technical Efficiency (TE)} = \frac{\sum_i x_i tP_i}{\sum_i x_i P_i} \quad (1)$$

$$\text{Economic Efficiency (EE)} = \frac{\sum_i x_i eP_i}{\sum_i x_i P_i} \quad (2)$$

Therefore,

$$\text{Allocative Efficiency (AE)} = \text{EE/TE} = \frac{\sum_i x_i eP_i}{\sum_i x_i tP_i} \quad (3)$$

Gross Margin (GM) analysis was adopted in measuring and comparing the cost and returns of both farm groups.

RESULTS AND DISCUSSION

The results discussed are entirely based on the 2006-cropping season for both local and foreign farmers. It is important to note that the local farmers had scattered plots of land probably as a result of their displacement and as such the crops planted (sole and combined) were considered. In the event of the study, it was discovered that for the local farms, 100% of the respondents were males, implying the dominance of males as household heads in the study area, who basically plant various crops such as millet, maize, cowpea, soya beans, rice, yam and melon. This research dealt with those farmers who planted rice, maize, yam and melon. It was also discovered that 82% of the farmers planted maize, 76% planted yam, while 60 and 78% planted rice and melon, respectively. On the other hand, 80, 40, 70, 30 and 40% of the foreign farmers planted maize, groundnut, soya beans, cowpea and rice, respectively.

From this result, it is clear that the mean output of communal farming is 5,511MJ/15,000 kg per annum with minimum and maximum values of 874 and 12,722 MJ/15,000 kg per annum, respectively. These figures when compared with the mean, minimum and maximum values for the Nigerian farmers on the basis of output in MJ/ha/annum are larger and thus attributed to number of cropping seasons practised in communal farming.

However, the results of labour use per hectare indicate mean, minimum and maximum values for 261.5, 175 and 348 Man-days, respectively for communal farmers as opposed to 37, 27 and 47 Man-days, respectively for foreign farmers. The relatively high value of manual labour experienced by local farmers is largely attributed to the conventional methods of farming still practised in most sub Sahara, Africa. This method generally involves the use of crude implements such as hoes and cutlasses for energy-sapping works such as stumping, land preparation, harvesting and transportation of their produce to the final points of sale. Furthermore, land is presumably efficiently utilized on per hectare basis by local farmers as the same piece of land which is in most cases scattered and disjointed is used in planting up to two or three crops annually. These crops are usually in combined form i.e., mixed cropping system or at times, crops are planted at the off season of other crops.

Seed application rates statistics; indicate that local farmers apply more seed on per hectare basis per annum than their foreign counterparts. This is apparently so since, it is the perception that foreign farmers have more access to improved high yielding seeds. On the other hand, fertilizer application is greater per hectare per annum for foreign farms when compared to communal farming. This is largely due to access to a high working capital by foreign farmers. The summary of the statistics for input and soico-economic variable of both the foreign and local farms per hectare basis is shown in Table 1.

The mean values for agrochemicals and tractorization are 3 L ha^{-1} and two machine-days for foreign farmers and 0.87 L ha^{-1} and 0.38 machine-days for the local farmers. As expected the areas of agrochemicals used and tractorization are about 3-5 times greater for foreign farms on per hectare per annum than their local counterparts, considering the fact that communal farming is done at least three times a year. The summary of DEA showing various efficiency estimates for the two farm groups in the study is presented in Table 2.

Technical, allocative and economic efficiencies: In analyzing and establishing the determinants of in-efficiencies in the data collected for both local and foreign farms, the Maximum Likelihood Estimate (MLE) of both Cobb Douglas and Trans-log production functions were adopted using the FRONTIER 4.1 computer programme. The results of these analyses indicate that the data of the foreign farms gave a singular matrix signifying a no solution to parameter estimates for both the OLS and MLE. This result supports the mean technical efficiency which is gotten from the DEA analysis as 100%. Therefore, presumably there are no socio-economical and environmental variables that affect their technical efficiency. On the other hand, the local farmers had a mean technical efficiency of 72% as opposed to 92% presented in Table 2 for the DEA.

The coefficients of Maximum Likelihood Estimates (MLE) of land cultivated for local farmers presented in Table 1 show a positive value of 38.14 which is highly significant at 1%. This portrays that if land cultivated is increased by a percentage, while holding all other inputs constant there will be an increase of about 38.14% in output levels. Inherently, one can posit that local farmers seriously under utilize land. Similarly, the results for seeds, when increased by a percentage will lead to a 0.22% increase in output levels. Although, this result indicates that increment in seed use will bring about increase in output levels, the standard error is not significant.

Table 1: Summary statistics for input-variable and socio-economic variables of both foreign and local farms in per ha

	Foreign farmers				Local farmers			
Variables	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.
Maize ha^{-1}	874	3035	1755	480	971	2833	1925	555
Melon ha^{-1}	122	586	324	110	N/A	N/A	N/A	N/A
Rice ha^{-1}	1350	2750	2041	413	2750	3500	3125	293
Soya Beans ha^{-1}	N/A	N/A	N/A	N/A	1466	3420	2303	610
Yam ha^{-1}	867	16193	10747	3246	N/A	N/A	N/A	N/A
Cowpea ha^{-1}	N/A	N/A	N/A	N/A	147	163	156	7
Groundnut ha^{-1}	N/A	N/A	N/A	N/A	2198	3420	2812	505
Output ha^{-1}	874	12722	5511	82.19	653	2622	1750	640
Land (ha)	0.40	3.6	1.61	0.78	120	575	272	141
Labour (mandays)	175	600	348	82	27	60	47	10
Seeds (MJ kg^{-1})	29	2387	974	687	8	1466	366	516
Fertilizer (Kg)	83	750	229	105	160	540	329	110
Agrochemical (lit)	0.13	1.75	0.87	0.34	1	4	3	1
Machine intensification	0.38	0.38	0.38	0.38	1	2	2	0
Exp (years)	10	32	18	5	19	38	31	5
Household size	2	36	14	6	N/A	N/A	N/A	N/A

Table 2: Summary of table of DEA, showing the various efficiency estimates of both farm groups

	Local farmers						Foreign farmers					
	TE = 0.96		AE = 778		EE = 0.750		TE = 1.00		AE = 0.821		EE = 0.812	
Efficiency range	FEQ	C.F	FEQ	C.F	FEQ	C.F	FEQ	C.F	FEQ	C.F	FEQ	C.F
50	0	0	5	10	6	12	0	0	1	10	1	10
51-60	0	0	2	4	2	4	0	0	3	30	3	30
61-70	0	4	5	10	11	22	0	0	2	20	2	20
71-80	4	8	13	26	10	20	0	0	0	0	0	0
81-90	5	10	15	30	11	22	0	0	4	40	4	40
91-100	41	82	10	20	10	20	10	100	10	100	10	100
Total	50	100	50	100	50	100	10	100	10	100	10	100

CONCLUSION

The implementation of Foreign Direct Investment (FDI) inflows into agricultural Sector of Nigeria has not been saddled with problems of socio-political and economic instability and a non-receptive financial and institutional environment for FDI. On the strength of this, the study makes the following policy recommendations that institutional supports be given in the area of increased access to improved and highly yielding variable inputs such as seeds, fertilizers, agro-chemical and machinery with emphasis being placed on the best use (combination) of these resources. This is particularly important in the case of local farmers, since this research and previous research works have emphasized that production efficiency will be significantly increased and perhaps enable local farmers compete favourably with the New Nigerian Farmers if given the same leverage. Efforts should also be geared towards improving the basic market performance by reducing overall cost of variable inputs. These reductions in inputs should be in form of government subsides. These subsidies will no doubt bring about increases in the access to output market and facilitate the demand-supply side incentives for maximizing output levels as documented in most part of the world especially in sub-Saharan Africa. Apparently, this will create a window of opportunity for local farmers in the areas of technological transfer and increased human developmental standards. Going by the general opinion that Public-Private Partnership is a consensus approach in moving forward the Nigerian economy, the case of agriculture should not be an exception, particularly as regards partnership between intending State Governments and Foreign Investors as much as it is desirable to provide basic power, communication and other infrastructural facilities in order to attract FDI, it is also desirable that governments should diligently investigate the strength of capital inflows and technology competence that will be attracted into the economy from the would be investors. Considering the land-induced problems and conflicts that have trailed the entrance of the Zimbabwean Farmers to Nigeria and considering the circumstances of their exit from their erstwhile country, it is imperative to take cognizance of the long-term effect of the displacement of local farmers.

It was noted in the course of this study that for agricultural and economic growth to occur, technological driven-approaches need to be considered in order to achieve an optimum combination of farm inputs, which is one strong point the foreign farmers have on their side.

However, in as much as government is prepared to co-finance agricultural investment by foreign investors, it should also extend the same leverage to the local farmers or indigenous farmers particularly in the form of input supports at subsidized rates.

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