Effect of Agricultural Exports on Food Security in Ebonyi State, Nigeria

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The objective was to determine the effect of agricultural exports on food security in Ebonyi State of Nigeria. Data were collected from both primary and secondary sources. A multi-stage sampling technique was used for the selection of one hundred and twenty (120) farmer respondents and the resulting data were analysed using both descriptive and inferential statistics. The results showed that agricultural exports contributed 75.5% of the total non-oil export earnings in 2005 and 65.6% in 2009. The major agricultural crops exported included cocoa, cassava, yam, maize, millet, oil palm, beans, palm kernel, groundnut, melon, rice, sorghum, soybean, plantain, and rubber. The output of cocoa, cassava, yam, and rubber were considerable, being 272.6, 49631.6, 359228.6, 312.0 (000'tons) respectively in 2009. The coefficient of multiple determination (R^2) was 0.786 or 79% which implies a good fit in the regression model. However, three principal factors were extracted as the major factors that affect food security. The factors are economic, natural and institutional factors. The study showed that the exportation of agricultural products has significant effect on the food security situation in Ebonyi State. Provision of micro credit for the enhancement of agricultural production as well as input subsidy and tax relief, and promotion of agricultural market driven economy to diversify the already existing oil economy are recommended.

Key words: agricultural products, export, food security, economy, Nigeria.

INTRODUCTION

In Nigeria, agriculture has been one the most important single activity in the nation's economy, with about 70% of the total working population engaged in it (Abolagba et al., 2010). It accounts for the largest proportion of total labour employment and as a vital source of foreign exchange in its export orientation. Agricultural export remains one major source of foreign earning aside the oil sector and has played a prominent role in supporting capital development projects. From the initial trade in palm-oil, Nigeria's agricultural exports have enlarged to include cocoa, beans, palm-kernel, cotton, groundnut and rubber (Agbolagba et al, 2010). Ekpo and Egwaklide (1994) asserted that agricultural export commodities contributed well over 75% of total annual merchandise exports in the 1960s. For instance, Nigeria was the largest exporter of palm-oil and palm-kernel; ranked

second in cocoa and occupied a third position in groundnut (Abolagba et al, 2010). Nigeria's export earnings from major agricultural crops contribute significantly to the Gross Domestic product (GDP) over the years. For instance, in 2005 an output of about 1,640.4; 28, 521.8 and 2,479. 2 tons were obtained from potato, yam and cocoyam respectively, while a total output of 111,780.7 tons were obtained from staple foods. A total of 456.4 tons of staple foods were exported with a value of N38,588.1 million in earning (CBN, 2005).

The accrued earnings from agricultural export in Nigeria have brought numerous benefits to Nigeria and the continent at large. The government revenue depended heavily on agricultural export taxes and both the current account and fiscal balances depended to

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some extent on agriculture before the discovery of oil (Folawewo and Olakojo, 2010). Since the oil-boom era of the 1970s, the contributions of agriculture to foreign earnings have remained abysmally low, representing less than 1% between 2000 and 2004 (CBN, 2005).

Although, agriculture is still the leading earner of foreign exchange from non-petroleum exports, the reduction in agricultural activities has caused a high level reduction in local food production, making Nigeria one of the leading nations in importation of food to supplement local production, which leads to growing importation and falling export earning (Nwachukwu, Ehumadu, Mayeha, Nwaru, 2008). The trends of importation of food has grown increasingly over the years with the food import bill attaining a height of about N76,818.9 million in 1996 and N173002.2 million in 2005 (CBN, 2005).

A household is said to be food secure if it can reliably gain access to food in sufficient quantity and quality for household members to enjoy a healthy and active life (Barret, 2002). This situation, pin-points a critical definition that food security is concerned with access to food. According to FAO (2002), availability of food, access to food and risk related to either availability or access are the essential determinants of food security. However, Nwovu (2008) opined that food security exist when all people at all time have physical and economic access to sufficient, safe and nutritious food to meet their dietary requirements and food preferences for an active and healthy life. Food security does not only depend on the available or adequate supply of food but the determinants of the export earnings in ensuring sufficiency in production and distribution, since it is a basic necessity of life.

In spite of the numerous potentials of exportation of some agricultural products in Nigeria, there have not been available empirical statistics on the effect of such exportation on the food security, especially in Ebonyi state.

The objectives of the study were to: determine the trends in Nigerian agricultural exports from 2002 to 2009; identify and characterize the major agricultural exports in Nigeria; analyze the effect of Nigerian agricultural exports on food security in Nigeria; analyze the overall food security profile of the study area and the factors affecting food security in the area; and analyze the factors that can enhance agricultural production and food security in the study area.

MATERIALS AND METHODS

The study was carried out in Ebonyi State of Nigeria. It lies approximately 7^0 30^1E and 5^o40^1N with a land mass of approximately 5,932 square kilometres and a population of 1,453, 882 persons (NPC, 2006). The state is made up of thirteen (13) Local Government Areas, which are divided into three (3) agricultural zones

namely: Ebonyi North, Central and South zones. The major crops grown in the area are, rice, yam, cocoyam, maize, cassava, groundnut, vegetables and fruits, while fishing activities are predominant in the southern zone of the state.

Both multi-stage and purposive sampling techniques were employed in the selection of 120 respondents that were used as sample size. Data on the agricultural exports of Nigeria from 2002 to 2009 were collected from both primary and secondary sources. Data collected were analyzed using descriptive and inferential statistics as the null hypothesis was tested using F* test @ 0.05 level of significance.

Model specification for simple regression

$Y = f (x).... ....Implicit$
$Y = βo + β_1X_1 + et......................... Explicit stochastic$

Where:

Y	=	Total farm output
X	=	Agricultural Export Earnings
$βo$	=	Constant
$β_1$	=	Regression coefficient
et	=	stochastic error term

Model for multiple regression

Y = $f(X_1 + X_2 + X_3 + X_4 + X_5 + X_6) – implicit$
Y = $βo + β_1X_1 + β_2X_2 + β_3X_3 + β_4X_4 + β_5X_5 + B_6X_6 + et .... explicit$

Where:

Y	=	farmers output (N)
X_1	=	Drought
X_2	=	Incidence of pests and diseases
X_3	=	Exportation activities
X_4	=	Incidence of flood
X_5	=	High cost of input
X_6	=	Land fragmentation
$βo$	=	Constant
$β_1- β_6$	=	Regression coefficients
et	=	Stochastic error-term

RESULTS AND DISCUSSION

Trends in Nigeria's Agricultural Export from 2000-2009
Figure I shows the analysis of earnings in Naira (₦) from agricultural produce exported within the period under review. The graph shows an undulating movement reflecting certain periods of shortfall and rise in aggregate earnings from agricultural exports. Drop in export value occurred in 2001 and 2004 but subsequent years
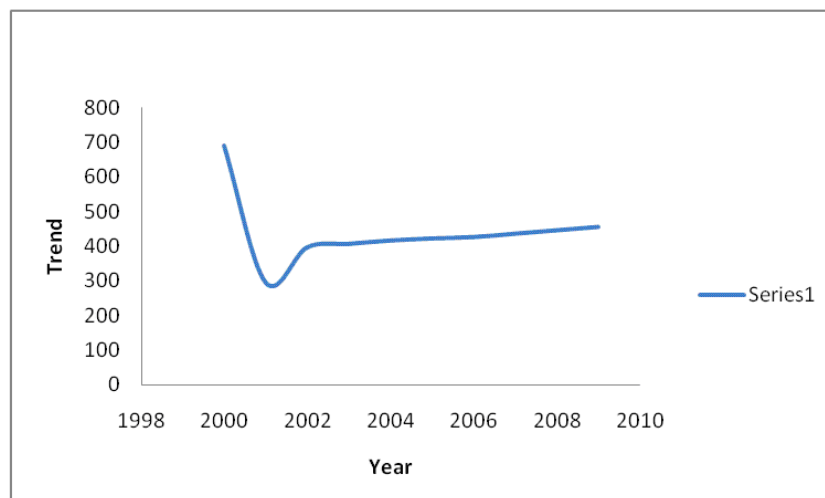
Fig. 1: Trends in agricultural exports ('000 tons): 2000-2009.

Table 1: Overview of features of Nigeria's major agricultural export.

Period	Average output of major agricultural exports	Average output growth	Contribution to Real GDP (%)	Average Export (₦'m)	Average export growth	Contribution to total Export (%)	Contribution to non-oil Export (%)
1970-1975	31002.1	-3.5	35.0	239.5	0.3	13.5	64
1976-1980	24428.4	-3.7	21.8	374.1	10.4	4.5	66
1981-1985	29523.2	14.3	30.6	226.7	1.1	2.5	78
1986-1990	55140.0	11.2	33.9	1667.3	78.5	4.2	60
1991-1995	89147.6	7.4	33.6	5849.7	72.6	1.7	64
1996-2000	108884.3	4.3	35.3	14978.6	-8.1	1.1	65
2001-2005	122820.1	2.7	41.0	36443.5	49.7	0.6	75.6
2006-2009	147219.9	3.2	40.0	4629.93	20.2	0.2	65.6

Source: CBN, 2010

recorded a steady increase. This increase can be explained by the renewed interest in agricultural development by the government Nigeria through policies and programmes (Yusuf and Yusuf, 2007; Abolagba et al., 2010)

The data in Table 1 shows the overview of performance that characterized the major Nigerian agricultural export from 1970-2009. From the data it was observed that there was a continuous fall in the average annual growth of agricultural output in Nigeria which coincides with the pre-SAP era. But soon after this era, the average output growth recorded a steady increment but at a decreasing rate in terms of percentage contribution to total exports. This was evident from the

steady growth from 64% between 1970 - 1975 to 75.6% between 2001 - 2005. This collaborates the findings of Folawewo et al. (2010) that prices of Nigerian agricultural products were characterized by inconsistent rise and fall within the period under review.

Table 2 shows the output in tonnes of selected agricultural crop; namely: cocoa, cassava, yam and rubber produced from 2000-2009 in Nigeria. The outputs of these crops were on a steady increase. For instance the output of cocoa rose from 170.0 ('000 tons) in 2000 to 253.7 ('000 tons) in 2008. Even though, the output was on the increase, it still falls short of potential capacity output. Nigeria has the potential to produce 350,000 tons

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Table 2: Output of selected agricultural crops.

Year	Cocoa	Cassava	Yam	Rubber
2000	170.0	36,750.0	26421.0	223.4
2001	171.0	28,473.9	22522.5	225.1
2002	172.0	29,653.6	23456.1	233.0
2003	185.5	31698.1	25073.3	239.0
2004	202.6	33393.3	26700.2	241.1
2005	215.4	35885.0	28521.8	245.2
2006	227.7	39704.9	30343.9	259.6
2007	240.2	42661.8	31986.3	277.4
2008	253.7	46553.9	33873.6	295.1
2009	272.6	49631.6	35928.6	312.0

Source: CBN, Various years

Table 3: Export values of selected agricultural product exports in Nigeria/percentage of total merchandised export between 2000 – 20009 (₦'m).

Agricultural Products	2000 -2004	2005 – 2009
Cocoa Exports	3894.56	4849.48
Growth rate (%)	2.40	96.50
% in total export	0.09	0.11
% in agricultural export	6.47	7.33
Rubber Exports	1862.40	1891.1
Growth rate (%)	12.13	19.55
% in total export	0.04	0.03
% in agricultural export	-	-
Yam Exports	704.61	614.70
Growth rate (%)	51.33	60.15
% in total export	-	-
% in agricultural export	1.33	1.23
Cassava Exports	23.09	54.14
Growth rate (%)	66.45	82.17
% in total export	0.0003	0.001
% in agricultural export	0.05	0.06

Source: Oni (2007)

of cocoa beans per annum, but production only amounted to 250,000 tons in 2009 (CBN, 2010).

The result on the export value of selected agricultural products exported in Nigeria between 2000-2009 as shown in Table 3 indicates that cocoa was a leading export earner for the country having contributed 6.47% - 7.33% in 2000 – 2004 and 2005 -2009 respectively. This is an indication that cocoa is the leading non-oil/crop foreign exchange earner. The data also shows value earning from export of yam between 2000 - 2004 and 2005-2009 was N704.61 and N614.70 with its percentage share of total agricultural exports as 1.33% and 1.23

respectively. Meanwhile, earnings from rubber and cassava were relatively low compared to the cocoa and yam. However, cassava recorded the greatest (66.45% and & 2.17%) in growth rate in the respective periods 2006-2004 and 2005-2009, followed by yam with 51.33 % and 60.15 % respectively. This was an indication that cassava output increased as a result of intervention from government and private sectors. This finding justifies Abolagba, et al. (2010) who deduced that the various efforts made by government and private sector in Nigeria has led to increases in agricultural productivity.

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Table 4: Varimax rotated factors of the effect of agricultural exports on food security

Variables	Components		
	Increased foreign earnings	Availability of food	Scarcity and high cost of food
Increase in local production of food	0.98	0.87	0.86
Diversification of food production for local exporters	0.98	0.03	0.05
Rise in aggregate farm household income	0.97	0.06	0.86
Efficient production in farm outputs Decrease in domestic food supply	0.86	0.87	0.11
Increase in unit price of consumer goods	-0.02	0.87	0.69
Scarcity of food commodities Increase in food importation to supplement local production	0.98	0.05	0.05
Increase in foreign exchange	0.48	-0.03	0.40
	0.86	0.87	0.67
	0.86	0.04	0.67

Source: Field Survey, 2010.

Regression analysis showed the coefficient determination (R^2) to be 0.654, which implies that about 65.4 % variation in farm output was caused by the agricultural export earnings. Also the agricultural export earnings had a positive sign, being significant at 5%. This suggests that agricultural export has direct effect on agricultural productivity in Nigeria. Folawewo, et al. (2010) reported that agricultural exports can contribute to the overall increase in agricultural production. The final regression equation is as follows:

$$Y = 120421.37 + 0.89X$$
$$(4222.263)* (005)*$$

R-squared (R^2) = 0.654, Adjusted R^2 = 0.611, F-ratio = 15.121, * = significant at 5%

The effect of agricultural exports on food security was analysed (Table 4) using three (3) matrix factor components - increase in foreign earnings, availability of food and scarcity and high cost of food. Component (1) loaded on the following: increase in local production (0.98), diversification of food production for local exporter (0.98), increase in aggregate farm household income (0.97). Component (2) loaded high on increase in local production (0.8), efficient production of farm output (0.87), decrease in domestic food supply (0.88). Component (3) loaded high on increase in local production (0.87), increase income (0.86), decrease in domestic food supply (0.69,). These signify a high level of relationship between them, thus justifying the deduction (Abolagba, et al. 2010) that exportation of agricultural products increases diversification of food production by local producers.

For Ebonyi State, the factors affecting the food security profile include incidence of drought, and high cost of input and land fragmentation which had highly significant positive coefficients; the coefficient for the incidence of pest and diseases was also positive, being significant at 5%. Meanwhile, the exportation of agricultural products and incidence of flood had significant negative coefficients, confirming the *a prior* expectations as reported in Abolagba (2010) and Adio (2000).

The result equally indicated that the coefficient determination (R^2) was 0.775, implying that about 77.5 % of variation in the total farm output was attributed to the independent variables. This negated our *a prior* expectations. The final regression line was thus stated as:

$$Y = -26137.5 + 7229.5X_1 + 1405.7X_2 - 186.603X_3 - 4756.973X_4 + 33958.8X_5 + 19528.740X_6 + et$$
$$(10646.216)** \quad (1208.6)* \quad (685.99)** \quad (228.28) \quad (2061.720)** \quad (5289.98)* \quad (4283.23)*$$

R-squared (R^2) = 0.786, Adjusted R^2 = 0.775, F-ratio = 69.290, * = significant at 1%, ** = significant at 5%

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Table 4 also shows the varimax rotated factor matrix on the factors that enhance agricultural production, exports and food security in the area. The three (3) components matrix factors were: economic, natural and institutional factors. In component I (increased foreign earnings), reduced taxation on agricultural operations (0.88), increased rural infrastructure (0.88), input subsidy (0.68), and access to credit loaded high. This conforms with the findings of Nwovu (2008), that increased access to credit, land and production inputs by farmers will enhance food security in Ebonyi state. Component II (availability of food) shows that access to land (0.94), input subsidy (0.55), use of fertilizer (0.94) and improve research and technology (0.94) were the major influencing factors. In component III (scarcity and high cost of food), availability of ready market (0.82), input subsidy (0.67), access to land 0.67 were the observed factors that can enhance agricultural productivity. Folawewo et al. (2010) suggested that input subsidy in agricultural operation are part of the institutional responsibilities of government, if food security must be met.

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