



# Effect of Government Subsidies on the Income of Rice Farmers in Awka Agricultural Zone of Anambra State, Nigeria

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## Abstract

The phenomenon of high government spending on agricultural subsidies not yielding commensurate increase in output and income of farmers is of concern to stakeholders in the sector. This study looked at the effect of government subsidies on the income of rice farmers in Anambra State. The study was carried in Awka Agricultural Zone of the State because of the high concentration of rice farmers in the area. Multistage random sampling technique was used to select the location and 62 respondents used for the study. Data were collected by use of questionnaire and data collected were analyzed using qualitative and quantitative techniques. The net return model was used to estimate the income of the farmers while the ordinary least squares multiple regression model was used to determine the effect of subsidies on the income of the farmers. Result showed that average age of the farmers was 49 years with an average household size of 5 persons. The farmers made an average net return of N219755. Gender, marital status, non-farm income, farm size, cost of inputs and government subsidies were the variables that significantly influenced the net return of the rice farmers. The amount of subsidies given was significant at one percent and positively influenced the net return of the farmers. The study recommended that Government should sustain the subsidies being given to farmers to encourage them boost output.

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## Introduction

Most smallholder farmers in developing countries are subsistence oriented, cultivating food crops mainly for household consumption and growing a small proportion of cash crops to meet non-food household needs (ICAE, 2015). Furthermore, 75 per cent of rural people in developing countries are poor and food insecure, and therefore, improvement of agricultural production is the main strategy to reduce rural poverty and food insecurity [1]. Among several factors that impede such a livelihood strategy is the low use of improved farm inputs in crop production, especially fertilizer and hybrid seeds [2]. Druilhe and Barreiro-Hurle [3] argue that with low household incomes and limited income sources most smallholder farmers, especially in Africa, are unable to self-finance the purchase of adequate improved farm inputs to produce enough food and cash crops to meet household food and income security requirements. In order to promote the use of fertilizer and hybrid seeds, subsidies are one of the most pervasive policy instruments used by most governments in developing countries [1]. Prior to the implementation of structural adjustment and stabilization programs in the 1980s and early 1990s, which were promoted by the World Bank and the International Monetary Fund (IMF), most governments in sub-Saharan Africa (SSA) implemented farm input subsidies, which were phased out to conform to the agreements with the World Bank and IMF [2,3]. However, in recent years, many countries in SSA have reintroduced these subsidies, including Malawi [3,4].

Recent studies on the reintroduced farm input subsidies in Sub-Sahara Africa have focused on their direct and general equilibrium impact. Direct impact studies include effects on:

(i) maize output [4-6]

(ii) input markets [4,7]

(iii) land allocation [6,7] and (iv) household welfare, including food security [9]; income from crops production, livestock and asset worth [4,8].

Governments in sub-Sahara Africa have always given subsidies to farmers in the form of grants or inputs at reduced cost. For instance, the Government of Malawi has reintroduced a large scale farm input subsidy program since the 2005/06 agricultural season and used it as a policy tool to improve maize production, productivity, food security and household income from crop sales. However, despite the implementation of these programmes, food insecurity and poverty are still wide-spread among smallholder farmers especially in Nigeria. This raises doubts about the effectiveness and sustainability of these subsidies on farmers' output, income and welfare.

A **subsidy** is a form of financial aid or support extended to an economic sector (or institution, business, or individual) generally with the aim of promoting economic and social policy. Although commonly extended from government, the term subsidy can relate to any type of support – for example from NGOs or as implicit subsidies. Subsidies come in various forms including: direct (cash grants, interest-free loans) and indirect (tax breaks, insurance, low-interest loans, accelerated depreciation, rent rebates).

Whether subsidies are positive or negative is typically a normative judgment. As a form of economic intervention, subsidies are inherently contrary to the market's demands. However, they can also be used as tools of political and corporate cronyism.

An **agricultural subsidy** is a governmental subsidy paid to farmers and agribusinesses to supplement their income, manage the supply of agricultural commodities, and influence the cost and supply of such commodities. Examples of such commodities include: wheat, feed grains (grain used as fodder, such as maize or corn, sorghum, barley, and oats), cotton, milk, rice etc.

As mentioned previously, a number of studies including Chirwaet *al* [10]; Doward and Chirwa [9]; Ricker-Gilbert and Jayne [4,8] have been carried out on the impact of farm input subsidies, however, there are still gaps in the literature on their effects on household income and welfare.

The study looked at the i. socioeconomic characteristics of rice farmers in the study area; ii. it also estimated the net return of rice farmers and; iii. the effect of subsidies on rice farmers' net return.

## Methodology

### Study Area

The study was carried out in Anambra State. Anambra State is one of the states in south-eastern region of Nigeria. The State has four agricultural zones namely: Onitsha, Aguata, Anambra, and Awka and is bounded by Delta State to the West, Imo State and Rivers state to the South, Enugu State to the East and Kogi State to the North. Anambra state is the eighth most populated state in Federal Republic of Nigeria with a population of 4,055,048 people and second most densely populated state in Nigeria after Lagos state having a density of 837.1/km (2168.2sqmile) and a total land area of 4,844km (1870.3sqmile) with coordinates of latitude 6°20'N and longitude 7°00'E (NPC 2006).

Multistage sampling was used to select the location and respondents for the study. Firstly, one agricultural zone with high concentration of rice farmers was purposively selected for the study. Secondly two Local Government Areas also with high concentration of rice farmers were purposively selected from the agricultural zone. Thirdly, four rice producing communities were purposively selected from each Local Government Area giving a total of eight communities for the study. Lastly, eight rice farmers from each community were selected from a list organized by the local extension agent giving a total of sixty-four respondents for the study.

Objectives i and ii which is to describe the socioeconomic characteristics of the farmers and to estimate the net return of the rice farmers was estimated using the net return model. The model is specified as

$$\text{Net return (NR)} = \text{TR} - \text{TC}$$

Where TR= Total Revenue

TC= Total cost

TR= PQ

When P= price / unit of output (₦ / Kg)

Q= Qty of output (Kg)

TC= TFC + TVC

Where TFC= Total fixed cost (₦)

TVC= Total variable cost

The ordinary least squares multiple regression analysis was used to determine the effect of subsidies on the net return of the rice farmers in the area (objective iv). The model is specified as follows:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12})$$

Where Y= Net return (Naira)

X<sub>1</sub>= Age of the farmer (years)

X<sub>2</sub>= Sex (male=1, female=0)

X<sub>3</sub>= Marital status (married=1, otherwise=0)

X<sub>4</sub>= Household size (Number of persons)

X<sub>5</sub>= Educational level (years spent in school)

X<sub>6</sub>= Farm experience (years)

X<sub>7</sub>= Non-farm Income (Naira)

X<sub>8</sub>= Farm size (Hectares)

X<sub>9</sub>= Cost of inputs (Naira)

X<sub>10</sub>= Subsidies (Naira)

X<sub>11</sub>= Amount of credit (Naira)

X<sub>12</sub>= Depreciation of capital (Naira)

### Results and discussion

The results of the analyses performed are presented and discussed in this section.

Socioeconomic characteristics of the rice farmers were analyzed and the result is presented in Table 1.

The result in Table one shows that majority of the farmers (about 52%) were between the ages of 40-49 years. This is an indicator that most of the farmers were still in their productive age and would therefore be energetic and strong enough to carry out their rice farming activities. Rice farming is exerting and requires much energy and vitality which only youthful individuals may possess. The mean age of 49.42 reinforces the view that the farmers were in their productive age

Majority of the farmers were married. This may be adduced to the prevalent practice among rural farmers to have a family whose members would provide help on the farm.

The result also shows that majority of the farmers (about 73%) had household size of between 5-8 persons, which is an indication that the rice farmers had large households. This may not be unconnected with the need for labour on the rice farms which household members usually provide. It may also be an indication that the output from the farm is enough to sustain the household. The mean household size was about 5 persons.

Majority of the rice farmers had not more than 6 years of formal education. The average for years of formal education was 5.50 years. This implies that the farmers were barely educated and may be unable to cope with complexities involved in modern farming business. This may also impinge on the farmers' ability to diversify and increase income of the household.

The mean years of farming experience was about 17 years. This is an indication that most of the rice farmers have had a considerable amount of experience in rice farming and this may make up for the lack of education among them. Farmers are known to fall back on their experience when taking production and management decisions in the farm firm. The experience of these rice farmers may therefore be a valuable asset in their farming activities.

The result also shows that the farmers had very few extension contacts with extension agents with the mean extension contact being just about 1 visit in the past season. This paints a picture of how very poorly innovations and other incentives are being disseminated among the rice farmers. A vibrant extension service is important for higher productivity, output and income especially among the rice farmers. Rice is one crop that thrives on modern technology and these technologies can only get to the farmers by extension contacts from extension agents.

#### Net return of Rice Farmers in the study area

The analysis of the net return of the rice farmers is presented in Table 2.

**Table 1:** Socioeconomic characteristics of rice farmers in the study area.

Variable	Frequency	Percentage	Mean
<b>Age</b>			
30-34	1	1.61	49.42
35-39	3	4.84	
40-44	16	25.81	
45-49	16	25.81	
50-54	10	16.13	
55-59	3	4.84	
60-64	13	20.97	
<b>Marital status</b>			
Married	49	79.03	
Not married	13	20.97	
<b>Household size</b>			
1-4	17	27.42	5.40
5-8	45	72.58	
<b>Educational level</b>			
0 (no formal)	6	9.68	5.50
1-6	42	67.74	
7-12	14	22.58	
<b>Farming experience</b>			
1-10	7	27.42	16.7
11-20	31	50	
21-30	10	16.13	
31-40	4	6.45	
<b>Number of extension contacts</b>			
0	20	32.26	1.47
1-2	24	38.71	
3-4	18	29.03	

Source: Field survey, 2017.

**Table 2:** Estimation of the net return of the rice farmers in the study area.

Items	Unit	Average per Ha		Value (₦)
		Quantity	Unit price/cost	
<b>REVENUE</b>				
Rice output (yield)	Kg	2408	250	602000
Total revenue	₦			<b>602000</b>
<b>VARIABLE COST (INPUTS)</b>				
Seed	Kg	102	480	48960
Fertilizer	Kg	105	6500	89375
Agrochemicals	Litres	18.25	2700	49275
Labour Cost	₦			168610
<b>Total variable cost</b>				<b>356220</b>
<b>Fixed Cost</b>				
Depreciation on implements				19950
Rent on land				3340
Interest on loan				2735
Total fixed cost				26025
Total cost				382245
<b>GROSS MARGIN</b>				<b>245780</b>
<b>NET RETURN (TR-TC)</b>				<b>219755</b>

Gross margin analysis and net returns were used to determine the net return from rice farming in the study area. The result showed that the average total revenue of ₦602,000 was generated from sale of rice output. The total variable cost of ₦356,220 accounted for about 93% of total cost. This is an indication that the overhead cost in running the farm firm is high and takes a huge proportion of the farmer’s resources. This also implies that the subsidies being received by the farmers may not be influencing significantly the cost structure of the farm business. The farmers made an average net return of ₦219,755 which though low, however points to the fact that rice production in the area is profitable

**Effect of Subsidies on Income level of Rice farmers**

Table 3 shows the estimated regression results of the effect of subsidies on income level of rice farmers in the study area. The four functional forms namely, the double log, linear, semi log and exponential functions were fitted. The exponential function was chosen as the lead equation based on the values of R<sup>2</sup>, F-statistics and the a priori expectation. The coefficient of multiple determinations (R<sup>2</sup>) was 0.6839. This implies that 68.39% of the variation in the net return of rice farmers was explained by the explanatory variables.

Results showed that gender, marital status, non-farm income, farm size, cost of inputs and government subsidies were statistically significant at 1% and 5% levels of significance.

The coefficient for gender (3.217) was positive and statistically significant at one percent significance level. This implies that an increase in the number of male rice farmers by one per-

son increases the net return of rice farmer by ₦3.22k. This could be attributed to the physical strength of male farmers which over powers the drudgeries in rice production. This in turn increases the net income of the farmers.

The coefficient for marital status (0.6921) was positive and significant at five percent level. This shows that an increase in the number of married rice farmers by one person in the area increases the net return of rice farmers by ₦0.69k. This could be linked to the free family labour brought about through marriage and child-bearing which reduces the cost of hiring farm labour and therefore increases the net income of rice farmers.

The coefficient for non-farm income (0.00005057) was positive and significant at one percent level. This shows that an increase in non-farm income by one naira increases the net return of rice farmers by ₦0.00005057k. This could be linked to the role non-farm income play in offsetting both the food and non-food needs of the family. This in other words reduces the consumption expenditure from farm income and therefore increases the net income from rice production.

**Table 3:** Estimated Regression Results for the Effect of Subsidies on the Income level of Rice farmers.

	0	Exponential+	Linear	Semi-log	Double-log
Constant		-0.0152 (-0.562)	-19204.4 (-0.8765)	-465060 (-0.3730)	-0.7132 (-0.5090)
Age		-0.0152 (-0.562)	-19204.4 (-0.8765)	-465060 (-0.3730)	-0.7132 (-0.5090)
Gender		3.2174 (4.2704)*	2574814 (4.2099)*	2487746 -1.40208	4.6459 (2.3298)**
Marital Status		0.6921 (2.1539)**	266350.6 -1.02115	236205.2 -0.70427	0.62885 -1.6683
Household Size		-0.07212 (-0.7440)	-166431 (-2.11508)**	-738669 (-1.4186)	-0.2132 (-0.3643)
Level of education		0.0371 -0.49344	144064.4 (2.3607)**	694185.6 (2.02156)**	0.3427 -0.888
Farming experience		0.00516 -0.2427	54947.7 (3.1857)*	598396.8 (2.01858)**	0.1162 -0.3489
Non-farm income		5.06E-05 (4.2031)*	23.4394 (2.3998)**	84155.38 -1.44048	0.21463 (3.2657)*
Farm size		0.58663 (4.6548)*	422305.3 (4.1279)*	725779 -1.2392	1.4915 (2.2658)**
Cost of inputs		-7.63E-07 (-5.3995)*	-0.61253 (-5.3427)*	130493.6 (1.6913)***	0.14135 -1.63009
Government Subsidies		1.17E-05 (5.0647)*	0.66215 -1.3773	101062.9 -1.64409	0.11415 -1.65227
Amount of Credit		-4.98E-07 (-0.8409)	-5.901 (-3.1508)*	-103237 (-2.3315)**	-0.22318 (-4.4848)*
Depreciation		-9.16E-07 (-0.1455)	-8.4001 (-1.6431)	-95983.8 (-1.05956)	-0.0701 (-0.6885)
R2		0.6839	0.6838	0.4502	0.5425
Adjusted R2		0.6065	0.6064	0.3155	0.4305
F-value		8.8347	8.8305	3.3435	4.8424

\* Significant at 1%; \*\*significant at 5%, \*\*\*significant at 10%

The coefficient for farm size (0.5866) was positive and significant at five percent level. This shows that an increase in farm size by one hectare increases the net return of rice farmers by ₦0.57k. This could be linked to the increase in farm size which increases the number of rice stands and hence rice output and net return realized.

The coefficient for costs of inputs (-0.000000763) was negative and significant at one percent level. This shows that an increase in the cost of inputs by one naira in the area decreases the net return of rice farmers by ₦0.0000008k. This is an indication that for every one naira increase in the cost of inputs, the net return of the farmers decreases by ₦0.0000008k. This could be linked to the additional costs that reduced the naira value realized as net return.

The coefficient of government subsidies (0.00001168) was positive and significant at one percent level. This shows that an increase in the value of government subsidies by one naira in the area increases the net income of rice farmers by ₦0.000012k. This is an indication that subsidies have a positive effect on net return. This could be attributed to the cost-reducing effects of government subsidies especially the cost of farm inputs which in turn increases the net return of rice farmers in the area.

### Conclusion and recommendation

The study investigated the effect of government subsidies on the net return of rice farmers in Anambra State. The findings of the study showed that rice farming in the area is profitable and, that government subsidies have positive effect on the net return of rice farmers in the area. The study therefore makes the following recommendations:

1. Government should sustain the subsidies being given to farmers to encourage them boost output
2. The State Government should assist the rice farmers access inputs at reasonable prices so as to reduce the high variable cost expended on the farm
3. There is need for a functional proactive extension service which would disseminate technologies to the rice farmers as soon as these technologies are available
4. There is need to introduce alternative sources of income such as cottage industries in the area so as to provide the farmers with other income sources.

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