ISSN 0258-7122 (Print), 2408-8293 (Online)
Bangladesh J. Agril. Res. 45(4): 431-444, December 2020

EFFECT OF AGRICULTURAL POLICY AND RESOURCE UTILIZATION ON SMALL-SCALE GROUNDNUT PRODUCTION IN NIGER STATE, NIGERIA

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Abstract

The present research empirically determined farm resource-input utilization among the groundnut farmers and the effect of agricultural policy on groundnut production in Niger State of Nigeria. A total of 120 farmers were selected through a multi-stage sampling technique. Thereafter, a structured questionnaire complemented with the interview schedule was the instruments used to elicit information from the respondents and the collected data were analyzed using inferential statistics and the policy analysis matrix (PAM). The empirical findings showed that groundnut production is affected by the failure of the farmers to apply the recommended inorganic fertilizer dosages. In addition, the farmers were not economically efficient as allocation of the farm inputs were not optimized. The farm size, seed, manure, biocides and depreciation on capital had an index of greater than 1.00 while NPK and human labour AEI index were less than 1.00. Furthermore, the agricultural policy was not in favour of the farmers despite the effort in deregulating the agricultural marketing sub-sector. Therefore, the study recommends that the extension agents should re-train the farmers on the appropriate technologies needed in the application of recommended dosage for agro-chemical, especially inorganic fertilizer. In addition, the government should improvise a protectionist policy for the producers so that they can compete favourable and earn remunerative prices in the agricultural commodity markets.

Keywords: Resources; Optimization; Farm; Policy; Groundnut; Nigeria

Introduction

In Nigeria, groundnut has become a major staple food in most homes today and unfortunately, the domestic production of groundnut has not met the demand thereby leading to food shortages (Sadiq *et al*., 2017). The food problem in the country has been exacerbated by a low level of productivity of resources used in recent times which leads to low profit. The gap between demand and supply of agricultural products in Nigeria has been on the increase since focus shifted away from agriculture to other sectors of the economy (Audu *et al*., 2017). This is not unconnected to challenges such as inefficient management, low capital base and inadequate information about new production technology.

In spite of Nigeria's fertile soils, large expanse of arable land as well as suitable climatic factors all of which favours groundnut production, the nation's output of the crop has declined over the years, thus losing its leading position to countries

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like China and the United States of America that have invested immensely in both institutional and market organizations that linked the farmers to markets (Table 1; Figure 1 and 2) (Yusuf, 2016).

Based on the increased population in the study area, there is a need to match the gap with food production because groundnut is an important crop for realizing this dream given its nutritional and industrial benefits. The crop has been a principal commodity produced by the majority of households in the study area; hence, output increase of groundnut is an important step towards achieving self-sufficiency of the crop in the study area.

Given the above scenario, it becomes necessary to take an efficient approach towards optimum resource allocation so as to make farmers' income productive, thus keeping afloat the farm-firm business going concern. It is in the light of the above that the research on efficient allocation of farm inputs and the effect of agricultural policy on small-scale groundnut production in Niger State of Nigeria was conceptualized. The specific objectives were:

i. To determine the resource-use efficiency among the producers, and,

ii. To examine the effects of agricultural policy on groundnut production in the studied area.

Table 1. Production Trend of Groundnut in Nigeria

Year	Production	Area	Yield	PG (%)	AG (%)	YG (%)
1980	471000	563000	8366	-7.64331	10.47957	-20.2486
1981	530000	650000	8154	11.13208	13.38462	-2.59995
1982	458000	497000	9215	-15.7205	-30.7847	11.51384
1983	591000	650000	9092	22.50423	23.53846	-1.35284
1984	546000	600000	9100	-8.24176	-8.33333	0.087912
1985	621000	594000	10455	12.07729	-1.0101	12.96031
1986	896000	793000	11299	30.69196	25.09458	7.469688
1987	687000	597000	11508	-30.4221	-32.8308	1.816128
1988	1016000	707000	14371	32.38189	15.5587	19.92207
1989	1017000	800000	12713	0.098328	11.625	-13.0418
1990	1166000	707000	16492	12.77873	-13.1542	22.91414
1991	1361000	1127000	12076	14.3277	37.26708	-36.5684
1992	1297000	1046000	12400	-4.93446	-7.74379	2.612903
1993	1323000	1121000	11802	1.965231	6.690455	-5.06694
1994	1453000	1571000	9249	8.947006	28.64418	-27.603
1995	1579000	1767000	8936	7.979734	11.09225	-3.50269
1996	2278000	2266000	10053	30.68481	22.02118	11.11111
1997	2531000	2251500	11241	9.996049	-0.64402	10.56845
1998	2534000	2604700	9729	0.11839	13.5601	-15.5412

Year	Production	Area	Yield	PG (%)	AG (%)	YG (%)
1999	2894000	1929000	15003	12.43953	-35.0285	35.15297
2000	2901000	1934000	15000	0.241296	0.258532	-0.02
2001	2683000	1731000	15500	-8.12523	-11.7273	3.225806
2002	2855000	1878000	15202	6.024518	7.827476	-1.96027
2003	3037000	1985000	15300	5.992756	5.390428	0.640523
2004	3250000	2097000	15498	6.553846	5.340963	1.277584
2005	3478000	2187000	15903	6.555492	4.115226	2.546689
2006	3825000	2224000	17199	9.071895	1.663669	7.535322
2007	2847373	2202638	12927	-34.3343	-0.96984	-33.0471
2008	2872740	2336400	12296	0.883025	5.725133	-5.13175
2009	2977620	2643330	11265	3.522276	11.61149	-9.15224
2010	3799240	2789180	13621	21.6259	5.229135	17.29682
2011	2962627	2353680	12587	-28.2389	-18.5029	-8.21482
2012	3313500	2659800	12458	10.5892	11.50914	-1.03548
2013	2474530	2732700	9055	-33.9042	2.667691	-37.5814
2014	3399158	2799773	12141	27.20168	2.395659	25.41801
2015	3467446	2801756	12376	1.969403	0.070777	1.898836
2016	3581800	2680000	13365	3.192641	-4.54313	7.399925
2017	2420000	2820000	8582	-48.0083	4.964539	-55.7329

Source: FAO, 2020

Note: P, A, Y and G means Production, Area, Yield and Growth rate in percentage.

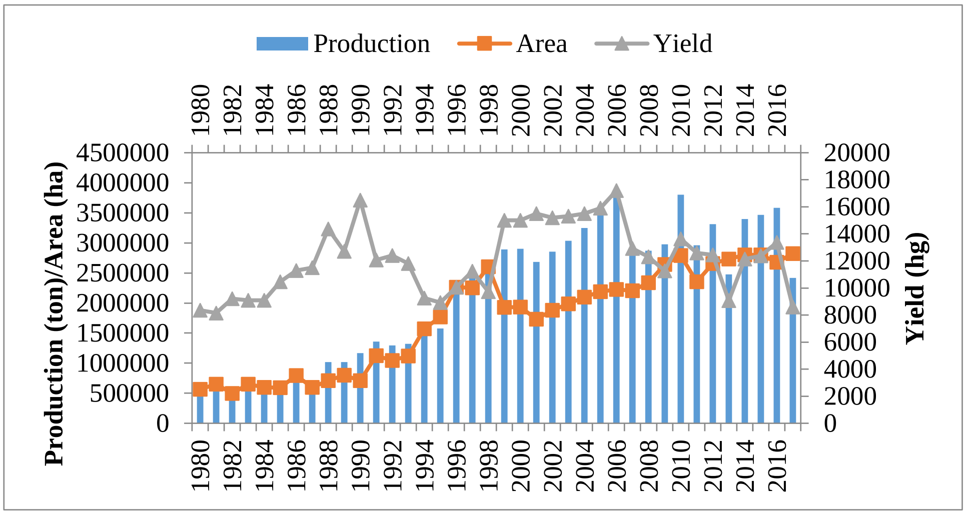

Fig. 1: Production trend of groundnut (1980-2017).

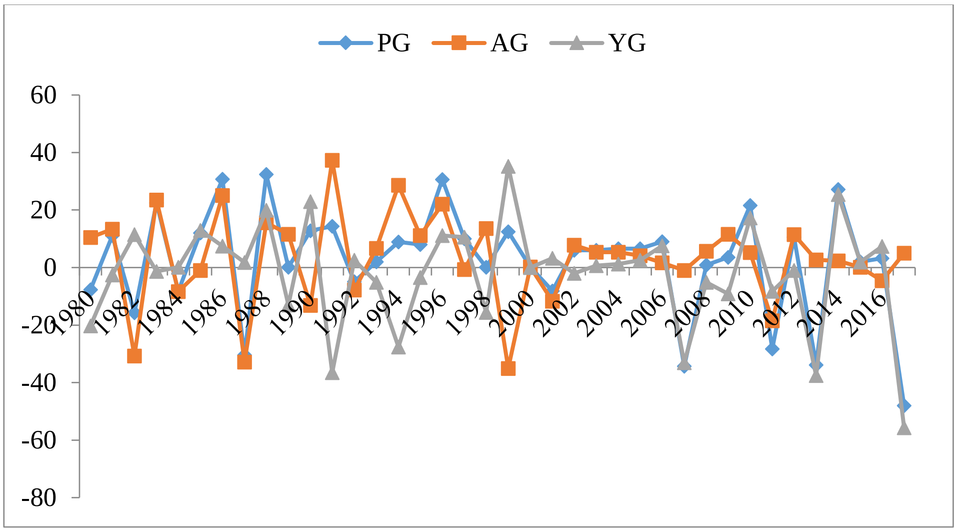

Fig. 2: Annual growth rates of production, area and yield (1980-2017).

Research Methodology

Study Area: The state is located between latitudes 8˚21˚N – 11˚30N and longitude 3˚30˚E – 7˚20E of the Greenwich meridian time and is characterized by Guinea savannah vegetation. Most of the inhabitants engaged in agricultural activities *viz.* arable crop production, livestock rearing, hunter, lumbering etc (Sadiq, 2014).

Sampling Techniques and Sample Size: The research adopted a multi-stage sampling technique in which one agricultural zone *viz.* Kuta was conveniently chosen among the three (3) existing zones. Thereafter, two Local Government Areas (LGAs) *viz.* Chanchaga and Shiroro were purposively chosen owing to the preponderance of groundnut producers and the potentials of the LGAs in the cultivation of the crop. Afterward, from each of the chosen LGAs three (3) villages were randomly selected; and from the chosen villages, twenty (20) producers were randomly selected, thus given a total of 120 respondents for the study. Data were elicited through a structured questionnaire complemented with the interview schedule. The first and second objectives were achieved using OLS estimation applied to the multiple regression model and policy analysis matrix (PAM).

Model Specification

1. Multiple regression model

The implicit form is as follow:

$Y = f(X_1, X_2, X_3, X_4, X_5)$ .... (1)

While the explicit form is:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon_t$...... (2)

Where:

Y = Output (kg); X_1= Farm size (ha); X_2= Seeds (kg); X_3= NPK (kg); X_4= Manure (kg); X_5 = Herbicides (ltr); X_6 = Human labour (manday); X_7 = Depreciation on capital items;β_0 = Intercept;β_{1-7} = Regression coefficients; and, ε_t = white noise

The functional forms fitted into the specified equation are as follows:

(a) Linear function

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots \ldots \ldots \ldots \ldots + \beta_n X_n + \varepsilon_t$ .... (3)

MPP= β

Elasticity = $\beta * \overline{X}/\overline{Y}$

(b) Semi–log function

$Y = \beta_0 + \beta_1 logX_1 + \beta_2 logX_2 + \beta_3 logX_3 \ldots \ldots \ldots \ldots + \beta_n logX_n + \varepsilon_t$ ...... (4)

MPP = $\beta/\overline{X}$

Elasticity = $\beta/\overline{Y}$

(c) The Cobb Douglas (double log) function

$logY = \beta_0 + \beta_1 logX_1 + \beta_2 logX_2 + \beta_3 logX_3 \ldots \ldots \ldots + \beta_n logX_n + \varepsilon_t$ .... (5)

MPP = $\beta * \overline{Y}/\overline{X}$

Elasticity = β

(d) Exponential function

$logY = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots \ldots \ldots \ldots + \beta_n X_n + \varepsilon_t$.......................... (6)

MPP = $\beta * \overline{Y}$

Elasticity = $\beta * \overline{X}$

Determining technical efficiency of resource use

The elasticity of production was used to estimate the rate of return to scale which is a measure of a firm's success in producing maximum output from a set of variable inputs.

EP = MPP/APP………………………………………………………….. (7)

Where:

EP = elasticity of production

MPP = marginal physical product

APP = average physical product

If

EP =1: constant return to scale

EP < 1: decreasing return to scale

EP > 1: increasing return to scale

Determining the allocative efficiency of resource-use

The following ratio was used to estimate the relative efficiency of resource use (r)

$AEI = MVP/MFC$ .... (8)

Where:

MFC or P_x = unit cost of a particular resource

MVP = value added to groundnut output due to the use of an additional unit of input, calculated by multiplying the MPP by the unit price of output i.e. $MPP_{xi} * P_y$

Rule of Thumb

If r = 1, resource is efficiently utilized

If r > 1, resource is underutilized

If r < 1, resource is over-utilized

Economic optimum takes place where *MVP = MFC*. If *AEI* is not equal to *1*, it suggests that resources are not efficiently utilized. Adjustments could, therefore, be made in the quantity of inputs used and costs in the production process to restore *r = 1* and the model is given as follows:

Divergence percentage (D %) $= (1 - 1/r_i) \times 100$ *or* $[\frac{(r_i - 1)}{r_i}] \times 100$....... (9)

2. ***Policy Analysis Matrix (PAM):***

PAM is usually built using farm budget, including revenues and costs, which occur in the form of tradable inputs (production inputs) and domestic resources (land and labor) (Table 2). In PAM, both revenues and costs are evaluated financially (at market prices) and economically (at border prices) to assess the effect/impact of the implemented policy by measuring Nominal Protection Coefficient for outputs and inputs, Effective Protection Coefficient and Comparative Advantage Coefficient (Domestic Resource Cost Coefficient-DRC).

Table 2. PAM structure

Items	Revenue	TIC	Domestic Cost			TDC	NI	VA
			LC	RV	D			
Financial Prices	A	B	C	D	E	F	G	H
Economic Prices	I	J	K	L	M	N	O	P
Policy Effect	Q	R	S	T	U	V	W	X

Note: TIC = Tradable input cost; LC = Labour cost; RV = Rental value; D = Depreciation on capital items; TDC = total domestic cost; NI = Net income; and VA = Value added

Nominal Protection Coefficient for outputs (NPC_O): Is the ratio between domestic and economic prices of outputs. It represents such kinds of protection or taxes that prevent equating domestic prices with border prices. It reflects the level of incentives or non-incentives offered to domestic farmers. It is shown below:

$$NPC_O = \frac{A}{I} \quad \text{……} \quad (10)$$

NPC> 1 means that domestic prices are higher than border prices, indicating implicit subsidy for producers.

NPC <1 means that domestic prices are lower than border prices, indicating that producers incur implicit taxes.

NPC = 1 means the absence of intervention in price policy, as well as absence of protection.

***Nominal Protection Coefficient for inputs (NPC_I)*:** It is the ratio between domestic and economic prices of outputs and it is given below:

$$NPC_I = \frac{B}{J} \quad \text{……} \quad (11)$$

NPCI> 1 means that the government subsidizes production inputs.

NPCI <1 means that the government imposes taxes on inputs.

NPCI = 1 means the absence of distortions in input prices.

Effective Protection Coefficient (EPC): It is the ratio of the value-added of a particular product in domestic market price to the value-added in economic price. It measures the net effect/impact of economic policy on domestic output and input markets and it is shown below:

$$EPC = \frac{G}{O} \quad \text{……} \quad (12)$$

EPC = 1 means the absence of distortions.

EPC> 1 means effective protection or incentives for producers.

EPC <1 means negative protection in the form of taxes imposed on producers.

The nominal protection coefficient for both inputs and outputs is used to estimate the structure of incentives at the commodity level, while the effective protection coefficient is a measure of price incentives.

Domestic Resource Cost Coefficient (DRC): It is the ratio between costs and benefits and it measures the efficiency or comparative advantage of a commodity in a system. It is given below:

$$\boldsymbol{DRC = \frac{N}{P}} \quad \text{……………………………………………………………….. (13)}$$

DRC <1 means that using less than one unit of domestic resources yields one unit of hard currency, an indication that the country enjoys a comparative advantage.

DRC> 1 means that more than one unit of domestic resources is used to acquire one unit of hard currency, an indication that the country has no comparative advantage in the global market. If the opportunity cost of using domestic resources exceeds the value-added estimated at world prices, it means that the economic activity is unprofitable.

Following World Bank (2000), the economic value for production factors is as follows: seeds are 1.12; inorganic fertilizersare1.45; Biocides are1.09; human labour is 0.75; Machinery is 1.12; economic rent i.e. opportunity cost for farm size; while for any other factors their current nominal value is taken.

Results and Discussion

Production Estimates and Inputs Allocation Efficiency

The results of the ordinary least square (OLS) estimation showed the exponential functional form to be the best fit for the specified multiple regression model among all the tried functional forms as it satisfied the economic, statistical and econometric criteria (Table 3). Thus, it was chosen as the lead equation to give an exploratory insight on groundnut production. The diagnostic test results showed the residual to be homoscedastic and normally distributed as evident by the Bruesch-Pagan and Chi^2 test statistics respectively, which were not different from zero at 10% degree of freedom. In addition, it was observed that the explanatory variables did not exhibit collinear relationship and the model specification is adequate as indicated by their respective variance inflation factors (VIF) which are less than 10.0 and the non-significant of the test statistic at 10% probability level, respectively.

Furthermore, the result showed the coefficient of multiple determination (R^2) to be 0.8904, implying that 89.04% of the variation in the output of the groundnut was influenced by the stimulus variables included in the model while the joint influence of the disturbed economic reality accounts for 10.96%. The predictor variables found to have an influence on the groundnut output were seed, fertilizer, herbicides, farm size and depreciation on capital items as evident by their respective statistical properties which were different from zero at 10% degree of freedom. The positive significance of the seed coefficient implied that the farmers used improved varieties and adopted the recommended practices, thus exerting a positive effect on the output of the groundnut. Therefore, the marginal and elasticity implications of a unit increase in the use of improved seed varieties by 1kg would increase the groundnut output level by 75.65kg and 0.508% respectively. A similar finding was reported by Zekeri *et al*.(2013), Audu *et al*.(2017) and Thulasiram *et al*.(2018).The positive significant of the depreciation on the capital items coefficient indicated high intensity in the use of primitive implements in the cultivation of this crop on a small-scale basis. Thus, the marginal and elasticity implications of a unit increase in the rate of depreciation of capital items by 1 naira will make the farmers to increase their groundnut output level by 0.024kg and 0.074% respectively.

The positive significant and inelastic of the farm size coefficient showed the presence of marginal effect of economies of size which is expected, given that the crop is cultivated on a small-scale basis. This did not come as a surprise as smallholder farmers lack economic capital but rather possessed social capital, thus farm outputs are mostly in small quantity. Therefore, the marginal and elasticity implications of a unit increase in the farm size by 1 hectare would increase output by 222.78kg and 0.328% respectively. This conforms with the findings of Bathon *et al*. (2016) and Audu *et al*. (2017). The positive significant of the herbicides coefficient signified the appropriate dosage application of the agrochemical, thus exerting a positive influence on the output level of groundnut in the studied area. Thus, the marginal and elasticity implications of a unit increase in the use of herbicides by 1 litre would increase output level by 115.95kg and 0.091% respectively. This agrees with the findings of Bathon *et al*. (2016) and Thulasiram *et al*. (2018) who in their various research reported a direct relation between biocides and groundnut output level. The negative significance of the fertilizer coefficient revealed an over-dosage in the application of the agro-chemical. Therefore, the marginal and elasticity implications of a unit increase in the quantity of inorganic fertilizer by 1 kg would decrease the output level of groundnut by 2.23kg and 0.186% respectively. Audu *et al*. (2017) found a contrary finding in their study.

The positive non-significant of the organic manure coefficient indicates insufficient use of this form of fertilizer owing to the use of close substitute i.e. the inorganic fertilizer in the studied area. In addition, this form of fertilizer is not in abundance in the studied area and the farmers' quest for high yield affected the use of organic residue fertilizer in the studied area. The positive non-significant of the human labour coefficient showed the substitution effect of herbicides, thus reducing the use of human labour for manual operation in the production of this crop in the studied area. The use of weed suppressant has become a common practice among the farmers in the studied area despite its consequence on the environmental condition of the soil and the climate. The positive significant of the managerial efficiency parameter indicated that the prevailing technology at the disposal of the farmers contributed to the output level of the groundnut production in the studied area.

The result of the return to scale showed the farmers to be operating in an uneconomic production stage i.e. increasing return to scale as indicated by the index value which is greater than unity (1.032). This implies that the farmers have the chance to increase the scope of their production to attain an economically viable point i.e. optimum production point which lies within the economic region of production by increasing the use of the resource at their disposal judiciously keeping in view the prevailing technology and market prices of input-output in the studied area (Table 3).

A perusal of Table 4 showed the highest contribution to the output owing to additional input to come from farm size while depreciation on capital items accounted for the least contribution to the output level as indicated by their respective marginal physical product (MPP) value. However, inorganic fertilizer contribution to the output level was negative due to inappropriate application owing to the benefits of subsidy and a bulk discount rate as farmers constituted themselves into farmers' groups in the studied area.

Furthermore, the empirical evidence showed that the farmers were not efficient in the allocation of all the farm inputs as evident by the under-utilization of almost all the resources except inorganic fertilizer and labour that were over-utilized (Table 4). Over-utilization of the inorganic fertilizer owes to the provision of subsidy coupled with bulk discount in the purchase of the input as most of the farmer groups have direct link to the agro-input suppliers. Thus, the farmers are advised to adjust their inputs if they want to take advantage of profit optimization in groundnut production in the studied area.

Effect of Agricultural Policy on Groundnut Production

The PAM results showed that the per hectare revenue of the financial and economic prices reached₦53670.39 and ₦71560.52 respectively, thus making the government agricultural policy on the producers to be ₦17890.13 (Table 5). Thus, this indicates that the farmers incurred an implicit tax of ₦17890.13 per hectare during the period of study. Furthermore, the agricultural policy has an effect on groundnut production as the cost of cultivation declined by ₦1841.13 during the production season. For the net income which reflects the implicit taxes and subsidy received, evidence showed the financial and economic prices to be ₦27425.23 and ₦44046.27 respectively, thereby resulting in policy effect of ₦16621.03. Therefore, it can be suggested that the farmers incurred implicit taxes to the tune of ₦16621.03 per hectare.

Table 3. Production determinants of groundnut output

Inputs	Ordinary least square (OLS)				Col. Test
	Linear	Exponential (+)	Semi-log	Double log	VIF (+)
Constant	105.376(197.88) [0.532]^{NS}	6.0904(0.1527) [39.86]***	1860.50(2084.12) [0.892]^{NS}	5.6571(0.9727) [5.815]***	
Farm size	317.271(75.948) [4.177]***	0.1698(0.0586) [2.897]***	822.777(176.057) [4.673]***	0.4908(0.0821) [5.974]***	2.442
Seeds	54.959(15.228) [3.609]***	0.05767(0.0118) [4.905]***	351.96(168.36) [2.090]**	0.3565(0.07858) [4.536]***	1.988
NPK	0.0634(1.0342) [0.0613]^{NS}	−0.001699(0.000798) [2.128]**	171.29(94.227) [1.818]*	0.02567(0.04398) [0.583]^{NS}	9.714
Manure	−0.00423(0.1627) [0.026]^{NS}	0.00013(0.000126) [1.052]^{NS}	−366.94(275.12) [1.334]^{NS}	−0.00602(0.1284) [0.0469]^{NS}	1.032
Herbicides	31.7271(7.594) [4.118]***	0.0884 (0.021) [4.2095]***	186.05(208.41) [0.893]^{NS}	0.5657(0.9727) [0.5815]^{NS}	
Human labour	1.6565(4.5609) [0.3632]^{NS}	0.00417(0.00352) [1.185]^{NS}	26.1758(110.746) [0.236]^{NS}	0.00992(0.05169) [0.192]^{NS}	1.153
Depreciation on capital items	0.01831(0.0108) [1.683]*	1.827e-5(8.398e-6) [2.175]**	5.6876(41.911) [0.135]^{NS}	0.0407(0.0195) [2.083]**	1.077
$\sum \beta$		1.031684			
R^2	0.923	0.8904	0.8945	0.9451	
Adjusted R^2	0.919	0.8845	0.8889	0.9422	
F-stat	225.65***	153.01***	159.76	324.61****	
Heteroskedasticity (B-G)	164.56{6.3e-33}***	0.388{0.767}^{NS}	46.306{6.14e-6}***	43.281{1.03e-7}***	
Normality test	48.00{3.76e-11}***	0.5265{0.718}^{NS}	15.260{0.00048}***	9.062{0.0107}**	
RESET Test	13.381{3.88e-4}***	0.6537{0.1736}^{NS}	59.569{5.33e-12}***	1.5e-4{0.9902}^{NS}	

Source: Field survey, 2018

Note: * ** *** ^{NS} significance at 1%, 5%, 10% and Non-significant respectively.

Values in ( ); [ ]; and { } are standard error, t-statistic and probability value, while Col. = Collinearity

Table 4. Technical and Allocative efficiencies of groundnut farmers

Inputs	Mean	APP	EP	MPP	MPV	MFC	AEI	D(%)	Decision
Farm size	1.9333	678.4772	0.328357	222.7831	16708.73	5000	3.341746	70.07552	UU
Seed	8.8	149.0568	0.507505	75.64705	5673.529	320	17.72978	94.35977	UU
NPK	109.17	12.01521	-0.18553	-2.22923	-167.193	56	-2.98558	133.4943	OU
Manure	1013.3	1.294483	0.133857	0.173276	12.99567	5	2.599134	61.52564	UU
Herbicides	1.0323	1270.658	0.091255	115.9543	8696.571	1000	8.696571	88.50122	UU
Human labour	19.776	66.32787	0.082545	5.475036	410.6277	750	0.547504	-82.6472	OU
Dep. on cap.	4034.4	0.325129	0.073699	0.023962	1.797131	1.18	1.522992	34.33978	UU

Source: Field survey, 2016

Note: UU = Under-utilization; OU = Over-utilization

RTS = 1.032; Output $\overline{Y}$ = 1311.70; P_y/kg = ₦75

Table 5. Effect of Agricultural Policy on Groundnut Production

Items	Revenue	Tradable Input Cost	Domestic Cost			TDC	Net Income	Value Added
			Labour cost	Rental Value	Depreciation			
Financial Prices	53670.39	9583.821	10288.47	3000	3372.86	16661.33	27425.23	44086.57
Economic Prices	71560.52	11425.03	7716.353	5000	3372.86	16089.21	44046.27	60135.48
Policy Effect	-17890.13	-1841.213	2572.12	2000	0	572.118	-16621.03	-16048.92

The NPC_O value revealed the absence of fair production policy as evident by its coefficient (0.75) which is less than unity. This indicates that the domestic price of groundnut produced by the farmers is lower than the international prices, thus resulting in the farmers incurring implicit taxes amounting to 25% as they received only 75% of the real price from their output. This vividly showed that the current agricultural policy is not in favour of the farmers during the study period. The NPC_I index indicates that the farmers received a subsidy of 16.12% on the production inputs as evident by the index which is lower than unity. This implies that input subsidy to the farmers is declining, an indication of economic compliance with the implementation of government agricultural policy on gradual removal of subsidy on agro-inputs until it attained price level proportionate to their market value. Thus, it can be inferred that the deregulation policy resulted in a limited subsidy on the production inputs in the studied area.

The EPC index (0.733) been lower than unity, indicates the absence of protection policy and the government has been imposing taxes either directly or indirectly, or it has been relaxing tariff on groundnut importation. Also, the DRC index (0.268) been less than unity showed that the studied area had a comparative advantage in the production of groundnut. In addition, it means that domestic production of groundnut is preferred to reliance on groundnut importation.

Conclusion and recommendations

Based on the findings it can be inferred that the production of groundnut in the studied area has been affected by the excess application of inorganic fertilizer. In addition, the farmers were not economically rational in the use of their inputs which is the basis of profit optimization in the studied area. Furthermore, the empirical evidence showed the current agricultural policy is not to be in the favour of the farmers in the studied area coupled with the absence of protectionist policy despite the deregulation policy which limited subsidy supply. Therefore, the change agents should re-train the farmers on the recommended dosage of agro-chemical application, especially inorganic fertilizer. In addition, the government should improvise protectionist policy so that the groundnut producers in the studied area can compete favourable in a liberal competitive groundnut market both locally and internationally.

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