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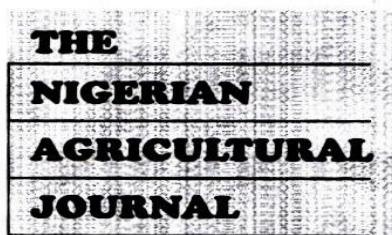
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# FACTORS INFLUENCING FARMERS' PARTICIPATION IN GOVERNMENT AGRICULTURAL PROGRAMMES, SOUTH-SOUTH REGION OF NIGERIA



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## ABSTRACT

Governments in developing economics have consciously established several agricultural based programmes in order to solve problems of poverty, malnutrition and low productivity of agricultural sector. The top – bottom approach used in designing these programmes has sometimes created dissatisfaction among beneficiaries. The bureaucracy involved in participation and the political terrain in the region have also affected the frequency of participation of beneficiaries. Premised on this, the study determined factors that influence frequency of farmers' participation in government agricultural programmes in Southern region of Nigeria. Data were collected from 390 farmers in the study area. Combinations of sampling methods were used to collect data. The Poisson model estimates revealed that, awareness index of farmers, political contact, access to ICT facilities, non-farm income and marital status of beneficiaries have positive and significant relationship with the frequency of farmers' participation. On the other hand, household size was inversely related to the frequency of farmers' participation in the region. In order to increase the efficiency of farmers' participation in agricultural programmes in the region, it is recommended that government should organize massive awareness campaign to sensitize farmers on government agricultural programmes in the region. It is also suggested that agricultural programme should be self-sustaining and not hinge on the political framework of the ruling party. Furthermore, governments of the region should provide infrastructure and internet facilities in the rural areas, as these will help dissemination information and strengthen networking or social capital formation among farmers.

**Keywords:** Farmers, Agricultural development, Agricultural programme and Nigeria

## INTRODUCTION

Several agricultural programmes have been enunciated by various tiers of government in Nigeria (Daniel and Ugwu, 2007; Iwuchukwu and Igbokwe (2012); Akpan et al., 2012; Agber et al., (2013), Akpan and Edet 2016). The formation of these programmes stem from the importance of agricultural sector and the need to encourage farmers to participate more in agricultural production. These programmes have assumed several forms such as training, subsidies, credit disbursement to farmers, formation of cooperative organizations and guaranteeing minimum price for agricultural commodities among others. Most of these agricultural programmes employed the top-bottom approach with minimal input and involvement of target beneficiaries. Currently, development experts are advocating agricultural programmes that focused on bottom-up approaches, and view beneficiaries as partners, utilize local experience and endeavor



to empower target beneficiaries (Kumba, 2003). In the South – South region of Nigeria, the low performance of agricultural sector has a devastating influence on farmers' welfare and is often linked to increase in rural poverty, huge capital flight, unemployment and malnutrition as well as increase militancy activities in the region (Akpan and Edet 2016). Increased exploitation of crude oil, deforestation and erosion as well as increase in impact of ocean tides on shores in the region have constituted serious hindrances to agricultural activities (Okon *et al.*, 2014). These activities have fast tracked environmental degradation and poor yields among farmers in the region. Also high population density and rapid urbanization as well as unplanned rural development are significant sources of externality costs to farmers in the region. Since more than 60% of farmers in the region have poor resource base, the need to develop and implement agricultural programmes by government became necessary.

The formation of agricultural programmes in the region is further justified by the aging farming population and increased rural –urban migration among youths (Akpan 2010 and Akpabio, 2012). In order to attract more people into farming activities, some of the government agricultural programmes came with incentives and improved technology as well as gender sensitivity. For instance, in Akwa Ibom State being one of the states in the south-south region, several agricultural programmes have been enunciated from 1988 to 2016 to attract youths into the agricultural sector to boost food production; example include: Rice Development Scheme, Fadama programme, Akwa Ibom State Integrated Farmers' Scheme, National Programme for Food Security, Women Agro-Entrepreneurship Development Programme, Commercial Agricultural Programme, Agricultural Loan Scheme, Small holder Oil Palm Development Project, Bio-fortified Cassava Stem Programme among others (Akwa Ibom State Agricultural Programme, document 2010 and Akpan *et al.*, 2015). These programmes have various objectives designed to attain self-food sufficiency and poverty alleviation. The frequency of farmers' participation in agricultural programmes is critical and is one of the basic indicators of programme performance. Thus, given the various conditions farmers in the region are exposed to and the characteristics of government owned agricultural programmes, it is important to identify those factors that influence the frequency of farmers' response to these programmes in the region. These factors are nuts and bolts needed by policy makers to design appropriate or bottom – top agricultural based programmes envisaged by contemporary development researchers. In order to solve these problems, the study specifically determines factors (farmers' specific, environmental specific and programme specific factors) that affect frequency of farmers' participation in government agricultural programmes in South –South region of Nigeria.

## **METHODOLOGY**

The study was conducted in Akwa Ibom State. The state is located in the Southern region of Nigeria. It is located between latitudes 4°32' and 5°33' North and longitudes 7°25' and 8°25' east. It has a total land area of areas of 7,246km<sup>2</sup>. The mean annual temperature of the state lies between 26°C and 29°C and average sunshine of about 1,450 hours per year.



The mean annual rainfall ranges from 2,000mm to 3,000mm, depending on the area. Maximum humidity is recorded in July while the minimum occurs in January. The state is bordered in the East by Cross River State, in the West by Rivers State and Abia State, and in the South by the Atlantic Ocean. Akwa Ibom State has a population of about 3,902,051 and a population density of 634 persons per square kilometers (National Population Commission, 2006). The state is basically an agrarian society where crops like maize, okra, waterleaf, cassava, yam and rice are cultivated in large quantities. Fishery including aquaculture; livestock and poultry businesses thrive well in the state. The state was picked among other states in the region because of its rich agricultural potentials and availability of survey data. In addition, the state has well demarcated rural and urban areas. Furthermore, the geography of the state supports diverse agricultural activities, in addition to its being one of the most peaceful States in region and Nigeria. The state has thirty one (31) local government areas divided into three (3) senatorial/political districts. The three Senatorial districts are: Eket district which has twelve (12) local government areas; Uyo district has nine (9) local government areas and Ikot Ekpene district has ten (10) local government areas.

**Sample Size Selection**

Following the work of Cochran (1963), a representative sample size from a large

$$S_n = \frac{z^2 \rho(1 - \rho)}{D^2} \dots \dots \dots (1)$$

Where  $S_n$  is the required sample size; “Z” is the standard normal variate (at 95% confidence interval, type 1 error; 1.96). “P” is the expected proportion of farmers in the population (We assumed that 60% of the population are farmers from 1995 farm survey in the State). “D” is the absolute error or precision at 5% type 1 error.

$$S_n = \frac{(1.96)^2 0.60(1 - 0.60)}{(0.05)^2} = 369 \dots \dots \dots (2)$$

However, the study adopted proportional sampling method in the study area, hence a total of 390 (three hundred and ninety respondents) were used in the study.

**Data Source and Sampling Procedures**

Primary data were used and respondents were farmers (including crop and animal farmers). Combination of sampling methods was used to select respondents. Firstly, two local government areas with clearly distinct rural areas were purposively selected from each of the Senatorial district in the State. A total of six (6) local government areas were selected and used for data collection. In the second stage, five rural villages were randomly sampled from each of the six local government areas selected. A total of thirty rural villages were randomly sampled from the six local government areas used for data collection. In the third stage, thirteen (13) farmers were randomly picked from each of the sampled village. On the whole, a total of three hundred and ninety (390) farmers were randomly sampled and used for data collection.

randomly sampled and used for data collection.

**Empirical Model**

To determine factors that influence frequency of farmers' participation in government agricultural programmes

The number or frequency of participation was considered discretely and which takes only non-negative integer values; therefore the count-data model was specified. We chose a Poisson model (Santos Silva and Tenreyro, 2006). The model is explicitly shown as;

$$U_i = E\{Y|X\} = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n \dots \dots \dots (3)$$

In Poisson model, the estimated coefficients correspond to semi-elasticity. Thus, coefficient estimates can be directly converted into marginal effects. For a continuous regressor  $X_i$ , the marginal effect is

$$\frac{\delta U_i}{\delta X_i} = \frac{E\{Y|X\}}{\delta X_i} = \exp(X\beta) \beta_i = \beta_i U_i = \beta_i e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n} \dots \dots \dots (4)$$

Implicitly, the Poisson regression model is shown below:

$$NFR = \phi_0 + \phi_1 AGE + \phi_2 EDU + \phi_3 FIN + \phi_4 EXT + \phi_5 SOC + \phi_6 PUR + \phi_7 LAO + \phi_8 EXC + \phi_9 MAR + \phi_{10} COS + \mu_i \dots \dots \dots (5)$$



Where,

- AGE = Age of a farmer (years)
- GEN = Farmers' gender (1 for male farmer and 0 for female farmer)
- EDU = Farmer's educational level (years)
- MAR = Marital status (unity for married and 0 otherwise)
- SOC = Membership of a social group (number of years)
- ICT = Access to ICT (Number of times a farmer browse internet in a month)
- LAO = Land tenure (dummy; 1 for owned land and 0 otherwise)
- AWA = Awareness index (number of sources a farmers heard about the programme divided by the total number of information sources available in the state)
- POL = Political party affiliation of a farmer (dummy; 1 belongs to the ruling party and 0 otherwise)
- NFI = Non-farm income of a farmer in the current planting season (Naira)
- HHS = Household size of farm family (number)
- FAE = Farmers' farming experience (Years)
- FAI = Farmer's farm income (Current season farming income in Naira)
- BUR = Government bureaucracy involve in accessing such programme (dummy; 1 for yes and 0 for No)

DEP = Dependent ratio (number of children i.e. from 0-14yrs and aged i.e. above 65yrs divided by the total household size)

EXT = Access to agricultural extension services (number of times in the current planting season)

### Verification of Multicollinearity among Explanatory Variables used in the Analysis

Multicollinearity is among the commonest econometric problems of the cross sectional data analysis. This property of econometrics was verified among explanatory variables to ensure the econometric stability and reliability of the regression estimates. The Variance Inflating Factor (VIF) and tolerance values were estimated and used to verify the presence of multicollinearity among explanatory variables. For VIF, the minimum possible value is 1.0; while value greater than 10 indicates likely collinearity between the specified explanatory variable in question and the rest of the predictors in the model. According to Gujurati and Dawn, (2009), VIF is estimated using the formula stated below:

$$VIF_j = \{1/1 - R_j^2\} \dots \dots \dots (6)$$

where  $R_j^2$  represents the multiple correlation coefficient between one of the explanatory variable (designated as dependent variable) and the other specified explanatory variables in the study. The explicit model explaining the above mechanism is shown in equation 6.

$$X_j = \varphi_0 + \varphi_1 X_1 + \varphi_2 X_2 + \dots + \varphi_n X_n + \varepsilon_n \dots \dots \dots (7)$$

$VIF_j$  has a unique relationship with the tolerance level. For instance,



$$Tolerance = 1/VIF = (1 - R_j^2) \dots\dots\dots (8)$$

he higher the VIF or the lower the tolerance index, the higher the chance of collinearity.

**RESULTS AND DISCUSSION**

**Test result to verify collinearity among specified explanatory variables**

Multicollinearity is a serious problem in a cross sectional study of a homogenous group, because variables tend to share similar history. Table 1 presents the Variance Inflating Factor (VIF) test results used to verify the status of the collinearity among explanatory variables used in the Poisson regression estimates. The result revealed that, there was no serious or significant collinearity among explanatory variables in the estimated model. For instance, the estimated VIF with respect to each variable specified was greater than unity, but less than the threshold value of 10. The result suggested that, the explanatory variables specified in the Poisson model do not exhibit multicollinearity tendencies. Also, the tolerance ratio is relatively low and falls below unity for each variable, signifying that, multicollinearity among exogenous variables is negligible. This implies that the estimates of the Poisson model to an appreciable extent or level of confidence interval are consistent and unbiased. In other words, the estimates of the Poisson model are stable and consistent over time. This means that the estimated coefficient represents a stable and average behaviour between the specified variable and the frequency of farmers participation in agricultural programmes in the study area.

**Table 1: The Variance Inflation factors (VIF) and Tolerance ratio test for Multicollinearity**

Variable	Variance inflation factor	Tolerance Factor
Age	1.552	0.644
Household size	1.427	0.701
Farm experience	1.422	0.703
Social group	1.293	0.773
Land ownership	1.181	0.847
Farm income	1.173	0.853
Awareness index	1.885	0.531
Political contact	1.979	0.505
Access to ICT	1.094	0.914
Bureaucracy	1.105	0.905
Nonfarm income	1.049	0.953
Access to Ext agent	1.179	0.848
Gender mixed	1.079	0.948
Marital status	1.055	0.948
Educational level	1.058	0.945

Source: Computed by authors using gretl software.

**Socio-economic characteristics of the respondents**

The descriptive statistics of farmers in the study area is shown in Table 2. The result revealed an average age of about 42 years for the farming population in the study area. This means that, most farmers in the area are fast aging out from active farming age. This result calls for an urgent move by government of the region and all stake holders to



mobilize younger ones into farming businesses in the area. Farmers' average period of formal education stood at 12.30 years. This result connotes that most farmers in the area are educated, and there is high possibility of agricultural innovation adoption among them. About 62.30% of the sampled farmers were male farmers. The result also showed that 89.50% of farmers sampled were married. Social capital formation among farmers was low in the study area, as shown by an average of about 2 years in social organizations. It was also discovered that, a farmer browsed the internet at least of 2.5 times a month. The result further showed that about 66.70% of farmers owned farm land either by inheritance or purchase. The rest acquired farm lands through lease and borrowed arrangement among others. An average farm income stood at N97009.60 in the study area; whereas the non-farm income was N33159.60. Farmers have moderate family size with a mean household size of 6 members, while extension agents visit on an average at 8 times per season. The farming experience among respondents averaged at about 14 years in the study area. The result also revealed that, about 48.50% of farmers have access to various agricultural programmes initiated by the state government. Awareness index was very low (in the scale of 0 to unity) among sampled farmers while political affiliation reached the height of 45.90% of the total sampled farmers. In addition, about 66.20% of farmers attested the presence of undesirable and long bureaucratic bottleneck in accessing agricultural programmes in the region.

**Table 2: Descriptive Statistics and socio-economic of farmers in the Southern region of Nigeria**

Variable	Minimum value	Maximum value	Mean	Standard deviation	Coefficient of Variation	Skewness
AGE	21.00	65.00	42.449	8.046	0.189	0.353
HHS	1.00	16.00	5.759	2.508	0.435	1.168
DEP	0.00	2.00	0.485	0.385	0.794	0.817
FEX	0.00	45.00	13.877	8.529	0.615	0.846
SOC	0.00	25.00	2.267	4.424	1.952	2.969
LAO	0.00	1.00	0.667	0.472	0.708	-0.707
FAI	0.00	500000	97009.6	117459	1.211	1.570
AWA	0.00	0.50	0.0952	0.121	1.275	1.183
POL	0.00	1.00	0.459	0.499	1.087	0.165
ICT	0.00	80.00	2.574	10.304	4.003	5.378
BUR	0.00	1.00	0.662	0.461	0.664	-0.846
NFI	0.00	1.680e+006	33159.6	97951	2.954	12.799
EXT	0.00	1.00	0.821	0.384	0.468	-1.670
GEN	0.00	1.00	0.623	0.485	0.779	-0.508
MAR	0.00	1.00	0.895	0.307	0.343	-2.575
EDU	0.00	15.00	12.295	3.454	0.281	-1.439

Source: Computed by authors, 2015. Note monetary value is expressed in Naira. Variables are as defined previously.

### Factors that modeled the frequency of farmers' participation in Government Agricultural Programmes in Southern region of Nigeria

Factors that influence farmers' participation in agricultural programmes were determined and are presented in Table 3. The diagnostic statistics shows that, the McFadden R-squared is about 0.3615, which implies that all the explanatory variables included in the model were able to explain about 36.15% variability in the frequency of participation in government programmes among farmers in the region. The large difference in McFadden R-squared explains the complexity involved in studying farmers' behaviour in developing economies. The value of the normality test attested to



the normal distribution of the error term generated in the Poisson regression. The Wald test is statistically significant at 1% probability level, implying that the estimated McFadden R-squared is significant and the Poisson regression has goodness of fit.

The empirical result showed that, household size of farmers (HHS at 10%) has a negative relationship with the frequency of participation in government agricultural programmes in the southern region of Nigeria. The result implies that, one percent increase in the household size of a farmer will lead to about 2.039% decrease in the number of times such farmer participates in government agricultural programmes in the region. This means that agricultural programme participation among farmers' decreases with increase in household size of farmers in the region. The possible reason for this result could be traced to the fact that, increase in household size will likely increase the household expenditure and time allocated to household issues. Hence, interest and bureaucratic bottleneck involved in programme participation might be too cumbersome for a household head to combine with the household issues.

The awareness index of a farmer has a positive influence on farmers' frequency of participation in government agricultural programmes in the region. The result implies that, a unit increase in a farmer's awareness index will positively increase the frequency of farmers' participation by 2.7 times. The result satisfies the a priori expectation, as awareness has a positive relationship with agricultural innovation adoption. This result suggests that awareness is one of the most important factors that model farmers' behaviour towards increased participation in government agricultural programme in the region. This result provides clear evidence that increase in the sensitization of farmers on government activities in agriculture will attract huge patronage from farmers. This result also called for bottom – top approach in agricultural programme planning, where farmers should be actively mobilized to contribute effectively and efficiently in designing, implementing and evaluating agricultural programmes in the region.

**Table 3: Estimates of the Poisson Model (Determinants of frequency of Farmers participation in government agricultural programme in in Akwa Ibom State)**

Variable	Coefficient	Robust Std. Error	z-values	Marginal effect	p-value
Constant	- 2.2608	0.5789	- 3.9048***	-	<0.0001
Age	0.0153	0.0105	1.4526	0.00707	0.1463
Household size	- 0.0439	0.0249	- 1.7645*	-0.02028	0.0776
Farm experience	- 0.0035	0.0086	- 0.4051	-0.00162	0.6854
Social group	- 0.0228	0.0173	- 1.3206	-0.01054	0.1866
Land ownership	0.0729	0.1828	0.3991	0.033685	0.6898
Farm income	4.95E-07	6.59E-07	0.7506	2.29E-07	0.4529
Awareness index	5.7802	0.6409	9.0192***	2.670859	<0.0001
Political contact	0.9565	0.2661	3.5948***	0.44197	0.0003
Access to ICT	0.0097	0.0034	2.8792***	0.004482	0.0040
Bureaucracy	- 0.1801	0.1146	- 1.5710	-0.08322	0.1162
Nonfarm income	1.25E-06	1.86E-07	6.7667***	5.78E-07	<0.0001
Access to Ext agent	0.1001	0.2972	0.3370	0.046253	0.7361
Gender mixed	- 0.0947	0.1232	- 0.7688	-0.04376	0.4420
Marital status	0.3402	0.2052	1.6574*	0.157196	0.0974
Educational level	- 0.0137	0.0198	- 0.6920	-0.00633	0.4890
<b>Diagnostic Statistics</b>					
Mean dependent Var.		0.851282	S.D. dependent Var.		1.301941
McFadden R <sup>2</sup>		0.361451	Adjusted R-squared		0.332290
Log-likelihood		- 350.3523	Akaike criterion		732.7046
Schwarz criterion		796.1629	Hannan-Quinn		757.8598
Normality test (Chi-square (2) )		119.455***	Over dispersion test		0.517817
Wald test (15)		508.36***			

Source: Computed by authors using gretl and Stata programmes, data from field survey 2015. Asterisks \*, \*\* and \*\*\* represent significant levels at 10%, 5% and 1% respectively. Variables are as defined in equation 1.



The coefficient of political involvement of farmers exhibited a strong positive relationship with the frequency of participation in agricultural programmes in the region. A unit increase in farmers' activities in politics will result in about 0.44% increase in their participation in government agricultural programmes. This result connotes that farmers that have strong affiliation to the existing political structure stand a better chance to benefit from government agricultural programmes than those who do not in the study area. This result might suggest the existence of dual motives of farmers' cooperative in the region. As noted by Akpan (2015), most of the farmer cooperatives in the region are politically motivated. They at some times serve as pressure groups and a veritable source of disseminating the ideology of the ruling political party.

The result also showed that, increasing farmers' access to ICT facilities strongly encourages the frequency of participation in government agricultural programmes among farmers in the study area. The finding supported the earlier result on awareness. This means that sensitization of farmers through mass media and social networks are the major keys to improving adoption among farmers in the southern region of Nigeria. For every 100% unit increase in ICT access, there is a corresponding 0.45% (ICT at 1% level) increase in the number of times farmers participate in government agricultural programmes in the region. This result pointed to one fact, and that is the urgent need to provide infrastructures and amenities in the rural areas where majority of the farm families reside. Akpan *et al.*, (2015) has reported similar result.

The slope coefficients of non-farm income and marital status of farmers are related positively to the frequency of farmers' participation in government agricultural programmes in the region. This means that, increase in non-farm activities of farmers' serves as incentive for them to participate more on government agricultural programmes in the region. This result thought is against a priori expectation, could be linked to the prevailing poverty rate among farming population in the region; insufficient income generated from farming activities and issues traceable to large household size of most farm families. The coefficient of marital status captures the effect of married farm household head on frequency of participation on government agricultural programmes in the region. This result is in consonance with the prevailing ideology on household size and agricultural innovation adoption. It is believed that, married households will likely have large household expenditure and other pressing family needs. In order to augment family income, it is a norm that a farm family will attempt to adopt technology that will generate additional income to the family. In this case, married household heads showed strong affinity to increased participation in government agricultural programme in order to support family expenditure. This result corroborates the findings of Martey *et al.*, (2013), Nxumalo and Oladele (2013) and Akpan *et al.*, (2015).



## CONCLUSION

The study summarizes the socio-economic features of farmers and identifies factors that affect the frequency of farmers' participation in government agricultural programme in South – South region of the Nigeria. The finding of this research has revealed some of the key factors needs to be considered in formulating highly participatory agricultural programmes in the region. However, self-food sufficiency can only be achieved by employing a holistic policy package that will focus on issues related to environment, socio-economic factors among others. Based on findings of the research, the following recommendations were proposed: Massive awareness campaign should be mounted by various government agencies, government mass media outfits and other organs of government to sensitize farmers on government agricultural programmes in the region. Agricultural programmes in the region should be designed with the ideology of political neutrality. It is suggested that such programme should be self-sustaining and not hinge on the political framework of the ruling party. This will eliminate favourism in selection and implementation. Government should provide infrastructure and internet facilities in the rural area. This will help in information dissemination among farmers. It is suggested that government of the region should develop family welfare scheme for farmers in the region. This will help to cushion the effect of expanding family expenditure and reconfigure the farming household head to adopt better technology.

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