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Income Impact of Growth Enhancement Support Scheme (GESS) on Rural Households in Benue State, Nigeria

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ABSTRACT

The research was carried out to determine the impact of growth enhancement support scheme on rural household income in Okpokwu Local Government Area of Benue State, Nigeria. The study utilized random sampling techniques to arrive at total number of 120 respondents. Data were collected using structured questionnaire and analysed using descriptive and inferential statistics. Result estimate with F-statistics ($P=0.000<0.01$) revealed that variables such as farm size, level of experience, quantity of harvest, and farm income influenced the farmers participation in growth enhancement support scheme. Chow test statistics $\approx 38.2 \sim F_{(2,34)} > F_{(2,30)}^{0.001} = 8.77$ showed a statistical significance at 0.1 percent indicated income difference between beneficiaries and non-beneficiaries of GESS. It was concluded that GESS impacted rural household income. How? Is it negatively or otherwise Education of farmers on the importance of participating in the growth enhancement scheme and provision of basic farm implements as well as telephones will enhance their future participation and higher income. There is to have critical recommendation at least one in the abstract

INTRODUCTION

Federal Government had embarked on and implemented several agricultural policies and programmed, some of which are defunct or abandoned and some restructured while other are still in place. These include Agricultural Development Projects (ADPs), National Seed Service (NSS), Agricultural and Rural Management Training Institute (ARMTI), Operation Feed the Nation (OFN) specialized Universities for Agriculture, Root and Tubers Expansion Programme (RTEP), etc. Source(s) Agricultural Production is still very low as a result of low level of input used by farmers, e.g. fertilizer, seeds. The old system was inefficient and fraudulent, there was a leaking pipeline where inputs went to political elites outside the country, while less than 11 percent of Nigerian farmers benefited (Dr Akinwumi Adesina 2012). The system lacked actuality and transparency (Adebiyi Adedapo 2013) Kindly use only surname for the reference in the body of the text. According to Adesina (2012) the aim of GES scheme initiative was to reform the fertilizer distribution system which was riddled with corruption. According to him whom is this him here?, just about 11 percent farmers ever got the subsidized fertilizer in the past. The rest of it was diverted by officials and shared to well-connected politicians or sold to marketers, leading to a loss of about N776 billion government funds between 1980 and 2010. Adesina (2013) also posited that Nigeria's, development efforts have over the years been characterised by lack of continuity, consistency and commitment agreed policies, programs and projects as well as an absence of a long-term perspective. The culminating effect has been growth and development of the Nigerian economy without a concomitant improvement in agricultural system in Nigeria. Despite the improvement global agricultural productivity, which has mitigated food deprivation around the world, food availability has remained largely uneven, with severe shortfalls in parts of the developing world. Indeed, about 800 million people in developing countries suffer from chronic food deprivation, in addition to 24 million people in developed countries and transitional economies, making food security a global challenge to policy makers around the world (FAO, 2012).

The contribution of agriculture to the Nigerian economic growth is very low compared to what it used to be in the past (Federal Republic of Nigeria, 2000 Cross check for current reference, as this seems to be over 22years ago). Nwanolue and Iwuoha (2012) include natural factors such as climate change, drought, flood; human activities such as deforestation, over concentration on bio-fuel (made from conversion of certain food items), environmental criminality and corruption, government failures at tacking desert encroachment and land conflicts problems which provision and availability of improved inputs, increased productivity and production, establishing a well established staple crop processing zone, reduce postharvest losses as well as improve linkages with the markets are all cantered on increased productivity. What is the relationship between thus and the topic Osinowo (2012) identified institutional, political, managerial, economical and social issues as the serious challenges and constraints facing the sustainability of the Agricultural Transformation Agenda and the Growth Enhancement Support Scheme. These challenges include: Resistance of bureaucrats to change, over dependence on foreign institutions and models, relegation of the findings of Research Institute and Universities, high interest on agricultural loans, and farmer's low technical capacity.



Furthermore, the Federal Government of Nigeria introduced Growth Enhancement Support Scheme in order to provides a unique connecting link as it targets the farmers directly with critically needed modern farm inputs on real-time basis. However, the illiteracy nature of the farmers may be the contributory factor that makes it impossible for them to access the inputs. Inputs allocated to farmers are often time difficult to access due to food insecurity as rural farmers utilized the low income in purchase of food instead of capital investment and other related challenges occur regularly thereby not reaching the targeted beneficiaries (farmers) of the scheme. Poor network many at times made it difficult to receive text messages with e-wallet system thereby posing challenges to farmers in getting their packages. Political challenge in which farmers' registration, input allocation and distributions are being politicized is also a growing concern thereby depriving real farmers from benefitting from the scheme. Bottleneck in the scheme brings about difficulty in redeeming input. While various schemes has been put to achieve global food security, there is little or no research on the effect of GESS particularly in Okpokwu Local Government Area of Benue state. Various studies on government schemes or programmes have been carried out in the past with mixed results. For example, Agricultural Development Projects (ADPs), National Seed Service (NSS), Operation Feed the Nation (OFN) specialized Universities for Agriculture, Root and Tubers Expansion Programme (RTEP), etc.

The question is what is the impact of GESS on income of the beneficiaries and non-beneficiaries in the study area? What are the influences of socio economic characteristics of farmers on participation in GESS? This study, will? Are you still waiting for the study to be carried out or already done show the gains that have accrued to the beneficiaries as result of participating in the Growth Enhancement Support Scheme which in turn can further highlight the need for further investment on the scheme by the interested stakeholders.

METHODOLOGY

The study will be conducted in Okpokwu Local Government Area of Benue state which is in North Central geopolitical zone of Nigeria. The Local Government Area comprises of only three districts namely Okpoga, Edumoga and Ichama. Administratively the Local Government are divided into twelve council wards namely, Eke, Amejo, Okonobo, Ingle, Ojapo, Ojogba, Okpogacentral, Okpoga west, Okpoga south, Okpoga North, Okpale-Ingle and Ugbokolo. The choice of Okpokwu local government is due to the fact that farming is the predominant occupation of the people there. It is located at about one hundred and seventy kilometres (170km), southwest of Makurdi Local Government Area, the state capital with cultivable land mass of 731km². It is bordered by Ohimini Local Government Area on the North, on it's western end by Ogbadibo Local Government Area and on the east by Ado and Otukpo Local Government Area while Isiuzo Local Government of Enugu state on the south and Olamaboro Local Government Area of Kogi state on the North West. The population of the study consists of all farmers in Okpokwu Local Government Area of Benue state. According to the National Population Commission (2006), Men's population in the Local Government stands at 138,000 while that of Women stands at 112,000 bringing the total to 250,000. In Okpokwu Local Government Area, there are 132 autonomous communities. The vegetation of the local government is that of a transition between the deciduous rain forest of Eastern Nigeria on the Southern part of the local government, and the grassland Savannah towards the North. The local government is surrounded by uphill stretching through the Northern part, while the lowland has fadamas fit for wet cultivation. This makes the local government home for the cultivation of arid tubers and grain crops found in the middle belt. this natural blessing makes the adoption of the veritable occupation of farming a general occupation in the area. The people are predominantly farmers, sowing various food crops like guinea corn, maize, soybeans, groundnuts, rice, millet, Beni seed and cassava (which is mostly exported in form of finished goods; garri to neighbouring states and Cameroon) in virtually all the areas of the local government.



Figure 2: Map of Benue state showing Okpokwu Local Government Area.

The population for the study is made up of all the farmers including beneficiaries and non-beneficiaries of the Growth Enhancement Support Scheme (GESS) in the study area. Content validity was used to measure the adequacy of the instrument items in this study. Content validity in this context seeks to determine the relevance of items included in the instrument. Using the Jury Method (Kerlinger, 1973), the entire instrument were subjected to the scrutiny by relevant experts. Each of the experts were requested to independently give his expert opinion on the relevance and adequacy of the items with respect to the objectives of the study. Various questions of the data collection instrument were scrutinized in terms of how relevant they are to the specific objectives of the study as well as how the prepared questions exhaustively cover the specific objectives of the study. Furthermore, the data collection instrument was examined against the background of its adequacy in regard to the accomplishment of the objectives of the study. Data were collected mainly from primary sources. The primary sources were obtained through the use of a structured questionnaire, copies of which was administered to the 120 Growth Enhancement Support Scheme beneficiaries that will be randomly selected for this study in Okpokwu Local Government Area of Benue state Nigeria. Primary data will be collected on the Socio-economic characteristics of the respondents, the impact of the GESS on agricultural productivity of the respondents, the constraints to participation in Growth Enhancement Support Scheme and the impact of the GESS on income in the study area. Data were analyzed using both descriptive statistics and inferential statistics. Descriptive statistics such as percentages and frequency distribution were used to describe the socioeconomic characteristics and Logit Regression Model was used to analyze the influence of socio-economic characteristics of farmer's on participation in GESS.

Empirical model for the determinants of the influence of socio-economic characteristics of farmer's on participation in GESS.

The dependent variable in this case, participation in GESS is a binary variable which takes a value of one (1) for participation and zero (0) for non-participation. The cumulative logistics probability model was specified by Pindyck and Rubinfeld,(1981) as;

$$P_i = F(Z_i) = \frac{1}{1 + e^{-a + \sum B_i X_i}} \dots \dots \dots$$

Where P_i is the probability that an individual participation in GESS X_i (the explanatory variables). a and B are parameters to be estimated. The log odds of the probability that an individual is participating in GESS is given by $\Pr(Y=1|x_i) = B_0 + B_1 \times X_1 + B_2 \times X_2 + B_3 \times X_3 + B_4 \times X_4 + B_5 \times X_5 + B_6 \times X_6 + B_7 \times X_7$

Where P_i is the probability of participating in GESS secure, X_i = vector of explanatory variables which are defined below:

- X1= Age (years)
- X2= Farm size(ha)
- X3= Engagement in off-farm Activity (yes=1;0 otherwise)
- X4= Level of Educational Household Head (years)



X5= Access to Credit (access=1;0 otherwise)

X6= Gender (male=1;0 otherwise)

X7= Quantity of Own production (kg)

Chow Test:

Chow-test will be use to test for the significant difference between the groups sampled. According to Dougherty (2007), Chow test statistics is often used in programme evaluation to determine whether the programme has impacts on different sub –groups of the population. The Chow test is an application of the F-distribution test, it requires the sum of squared errors from three regressions, one from each sample group and one for the pooled data. If F-chow is greater than the F-table, then there will be a project impact on beneficiaries otherwise no impact.

Chow is represented by the formular

$$F = \frac{R_{ss} - R_{ss1} + R_{ss2}/K}{R_{ss1} + R_{ss2}/n_1 + n_2 - 2K}$$

Where R_{ss} = Residual sum of square for pooled sampled, R_{ss1} = Residual sum of square for beneficiaries, R_{ss2} = Residual sum of square for non-beneficiaries, n_1 = Number of beneficiaries' sample, n_2 = Total number sample, K = Number of parameters. This tool will be use to achieve objective two. **GESS** = was measured as a weighted index of GESS indicators whether farmers had access to variables like seed, fertilizer, agro-chemicals and others. If farmers obtain any of the input =1 otherwise = 0. Thereafter, the cumulative average was obtained using weighted index.

Comments – The methodology of this work is not clear and did not follow the steps it suppose to follow to give us both sample frame and sample selection from LGA to community and also to the respondents. Also, the authors still presented this paper as they are still at the proposal stage of the write up. One did not understand where/how the 120 respondents came from or about.

RESULTS AND DISCUSSIONS

Impact of farmers' participation in GESS on their income

The result of the impact of the participation on GESS on their income is presented in table 1.

The table revealed a positive and significant relationship between farmers age and their participation in GESS on their income. The R^2 is 0.7806 meaning that the repressors were able to explain 78.06% of the impact of growth enhancement support scheme participation on income in the study area. The F-statistics ($P=0.000<0.01$) was statistically significant at 1% indicating that all the variables included in the model jointly exert significant impact on income. The coefficient of Farm size was positive (0.7505) and statistically significant at 1% ($P <0.01$). This means that as farm size increases income GESS participation increased. It implies that as farm with large farm size are likely to participate in GESS than farmers with small farm size. As the size of farm increases farmer participation in GESS will increased. This is interesting because with more farm size farmers productivity will increase and such farmers will require more input and support to effectively manage his/her farm. This agreed with the finding of Onu (2006), which asserts that farm size significantly influences both farmers' adoption decision and accessibility to extension services. It is common expectation that farmers with large farm size would commit a lot of resources to the farm project and would normally want to take advantage of material intervention and seek new practices support and hence more income. The coefficient of level of experience (0.4028) was positive and significant at ($P < 0.01$). This implies that a unit increase in level of experience will probably increase likelihood of GESS participation by 40.28%. This means that as the level of experience increases, the farmer acquires more information about support schemes and will be willing to participate and tries to make positive decisions. This is in line with the findings of Makhura (2011) who reported a positive and significant relationship between farm experience and maize adoption of new practices and involvement in training for new farming system.

The coefficient of quantity of harvest (0.0475) has a positive and significant relationship with the decision to participate in GESS at ($P < 0.01$). This implies that with increase in harvest farmer production scale will increase and this will require more skills and trainings on marketing, storage and processing which will require supports from external funds. This is so because most of the farmers in this research are low income earners who might not be able to acquire funds for expansion.

The results further reveal that the coefficient of Farm income was positive (0.000042) and significantly influenced scheme participation farmers at ($P < 0.01$). This implies that increase in income of the farmer will thus improve farm investment and also the increase in the output of the farmers and thus the willingness to participate in different schemes (Technoserve, 2011).

Table 4. Multiple regression of impact of farmers participation in GESS on income

Income	Coef.	Std. Err	T	P-value	95% Conf.	Interval]
Gess	1.63999	1.3180	1.24	0.213	-0.9433	4.22337
Land	0.1043	0.8009	1.29	1.197	-0.5424	0.26236
Fert	0.5083	0.4977	1.02	0.307	-0.4672	1.48401
Farm size	0.7505	0.2193	-3.42	0.001*	-1.1804	-0.32061
Education	0.7046	0.56003	-1.26	0.208	-1.8022	0.39303
Experience	0.4028	0.1112	-3.62	0.000*	-0.6209	-0.1847
Household size	0.8093	0.35754	2.26	0.024	0.1085	1.51014
Quantity of harvest	0.0475	0.01368	-3.47	0.001*	-0.0743	-0.02068
Farm income	0.000042	0.000012	3.44	0.001*	0.000018	0.000066
Constant	1.6715	3.0571	0.55	0.585	-4.32033	7.6634
Prob>F	0.000					
R ²	0.7806					

Source; Field Survey 2021

* = Significant at 5% significant levels

Influence of socioeconomic characteristics on farmers participation in GESS

The results of logistic regression is presented in Table 2. The ratio statistics indicated by chi-square statistics are highly significant ($p < 0.0000$). This suggests that the model has a strong explanatory power. The result revealed the other explanatory variables in the model had positive influence on participation of farmers in farmers income. Specifically, the results showed that at a coefficient of 2.458143, an increase in farmer's age will improve income at 24.5% and participation in GESS will increase farmers income by 0.65%. This result implies that as farmers increase in age they improve in farming experience and consequently farm which translate to additional production and increased income per production. The results also implies that with increase in participation in the growth enhancement scheme farmers will gain more training and support on how to improve their production which will improve their income.

The coefficient of sex was 0.4038 and positive. This means that being a male increases the probability of GESS participation increased. It implies that as male farmers are likely to participate in GESS than their female counterpart. Age, level of education are positively related to participation in GESS.

Logistic regression of Influence of socioeconomic characteristics on farmers participation in GESS

Dependent=participate	Coef.	Std. Err	t	P-value	95% Conf.	Interval]
Marital status	0.8886723	1.75455	0.51	0.6140	-2.587546	4.36489
House hold size	-2.394694	4.1724	-0.57	0.5670	-10.65941	5.870028
sex	0.4028	0.1112	3.62	0.000*	0.6209	0.1847
Ages	0.2458143	0.5628174	4.37	0.0000	1.343310	3.572976
edu	0.0006525	0.0000501	13.03	0.0000	0.0005533	0.0007517
Constant	-89.02554	23.90387	-3.72	0.0000	-136.3749	-41.6795
Log likelihood	-33.0701					
R ²	0.7419					
Adjusted R	0.7329					

Source; Field Survey 2021

* = Significant at 5% significant levels

Hypothesis

Ho: *The socio economic characteristics of the farmers has no significant effect on their participation in growth enhancement support scheme (GESS)*

The logistic regression model in table 5 was used to assess the effect of socio-economic characteristics of farmers on their participation in growth enhancement support scheme (GESS) (table 6). The result showed that some socio economic characteristics have significant effect on the level of farmers participation, this characteristics includes, beneficiary, age, and farm income. This result implies that the more a farmer benefits from the scheme the more he will participate in the program. It also mean that as a farmers age increase the more participation the person is likely to have. Farm income also have a positive impact on the participation of the farmer in the scheme. The null

hypothesis stated above is therefore rejected and the alternative that socio economic characteristics of the farmers have significant effect on their participation in growth enhancement support scheme (GESS) is stated and accepted.

The result of test of difference in the impact of growth enhancement support scheme (GESS) between the beneficiaries and non-beneficiaries is shown in Table 4

Chow test formula is given as;

$$\frac{[191.372 - (3.421 + 54.885)]/2}{(3.421 + 54.885)/(38 - 2 * 2)}$$

$$\frac{66.533}{1.714} = 38.817$$

$$F(k, n - 2k) = F(2, 34)$$

Critical value is =4.39 at 1% and 8.77 at 0.1%

Table 4: Chow test results showing the impact of difference in the impact of growth enhancement support scheme (GESS) between the beneficiaries and non-beneficiaries

Parameters	Values	Null hypothesis	Alternative hypothesis
		There is no difference in the impact of growth enhancement support scheme (GESS) between the beneficiaries and non-beneficiaries is shown	There is difference in the impact of growth enhancement support scheme (GESS) between the beneficiaries and non-beneficiaries is shown
R _p	191.372		
R ₀	3.421		
R ₁	54.885		
K	2		
N ₀	14		
N ₁	24		
F-	38.817		
Calculated			
Prob>F	0.000***	Rejected	Not rejected

Note: *** significant at 1%; ** significant at 5% and * significant at 10%.

Source: Computed from secondary data, 2018

Chow test conclusion:

Since the Chow test statistics $\approx 38.2 \sim F_{(2,34)} > F_{(2,30)}^{0.001} = 8.77$ from the F- table 4.15 showed a statistical significance at 0.1 percent significance level, the null hypothesis of no structural break is rejected. We conclude that the income difference between beneficiaries and non- beneficiaries. So, there is a significant improvement in the fit on splitting the sample base on policy. Therefore is a significant difference in the impact of growth enhancement support scheme (GESS) between the beneficiaries and non-beneficiaries.

CONCLUSION

Base on the findings of the study, it was concluded that GESS enhanced farmers income of rural households. The socioeconomic characteristics of the farmers such as farm size, farming experience, quantity of harvest, and farm income affects their participation in GESS. Participation in growth enhancement support scheme in the study area positively influenced farmers productivity and income generation through training, improved practice and supply of improved farming materials.it was recommended that farmers be educated on the importance of participating in the growth enhancement scheme and also basic amenities such as telephone should be made available to farmers to enhance their participation. It was also recommended that government should create similar growth enhancement support scheme or recreate the previous one to enhance continuous participation of both the beneficiaries and inclusion of non-beneficiaries.

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