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Impact of Agricultural Development Programme (ADP) on Rural Women Contact Farmers' Poverty Levels in Aguata Agricultural Zone of Anambra State, Nigeria

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Article

ABSTRACT

This study determined the impact of agricultural development programmes (ADP) on rural women contact farmers" poverty levels in Aguata, agricultural zone of Abia State, Nigeria. A–multi–stage random sampling technique was used to select 180 rural women farmers (90 a piece for rural women contact and non contact farmers). Instrument for data collection was two sets of pre–tested and structured questionnaires. The poverty line was ₦5037.79 and ₦5027.91 per month for rural women contact and non contact farmers respectively. Poverty incidence was 0.444 and 0.5222 for rural women contact and non contact farmers respectively. The result of the paired t–test showed that the ADP impacted positively and significantly on rural women contact farmers" farm income, farm size and fertilizer use levels at 5.0% risk level. The multiple regression analysis with double log as the lead equation showed that the critical determinants of gross expenditure of the rural women contact farmers include household size, farm size, labour use levels and farm incomes at given levels of significance. It was recommended the women farmers should be given increased access to agricultural lands to help boost agricultural output and reduce endemic poverty.

INTRODUCTION

Nigerian agriculture has been characterized by small scale production. This characteristic has led to low income hence, the farmers cannot afford yield increasing technologies and consequently experienced low output. Due to low incomes and output, the levels of investment in farms have been very low, forming a cycle called "vicious cycle of poverty" [1,2].

In order to break this cycle and improve the performance of the agricultural sector, the Nigerian governments, over the years, introduced and implemented several policies and programmes aimed at revamping the sector. Prominent amongst these programmes is the Agricultural Development Programme (ADPs) previously funded via a tripartite arrangement of the World Bank, the Federal Government and the State governments.

The ADP is perhaps the boldest step taken by the Federal Government of Nigeria to develop the agricultural sector of the economy. Thus the ADP became a central motive force for direct investment by government on small holder agriculture [3,4,5]. The ADP

was designed to improve the traditional systems of production and raise productivity by transfer of relevant and proven production technologies to farmers, easing constraints on inputs supplies and provision of rural infrastructure [6].

Strategies for achieving the ADP objectives in the crop sub-sector are usually the employment of On-farm Adaptive Research (OFAR) and Small Plot Adoption Technique (SPAT) [7]. These are achieved under the umbrella of the Training and visit (T & V) system of extension with male and female contact farmers as the centre piece of all extension actions. A contact farmer (male or female) is a progressive and receptive farmer trained by the village Extension Agent (V. E. A) on the new practices and through whom information is communicated to other rural farmers within the rural [8,9].

Despite numerous policies and programmes geared towards improving the living standards of Nigerians, it has been difficult to stem the growth of rural poverty especially among the women [10,11]. Despites the disproportionate agricultural roles played by the women contact farmers, they have remained seriously disadvantaged with respect to access to health, education, finance and credit, agricultural extension services, other productive resources and training opportunities. This, according to World Bank [12], is as a result of the legal, regulatory, cultural and structural barriers that have made women contact farmers status to be generally lower than men.

These have interacted to make women contact farmer more dependent on men contact farmers and have led to the evolution of a rigid division of labour and labour market highly segregated by gender. Men generally own and manage family land, incomes and women's labour thereby restricting women's ability to acquire new ideas, skills, contacts and employment outside the home, making men to the sole s beneficiary of economic development [7]. This unequal access to resources has made rural poverty to be synonymous with women. World Bank[12,13] confirmed that the depth and severity of rural poverty is highest in polygamous households affecting a large number of women in both rural and urban areas of Nigeria. The International Fund for Agricultural Development (IFAD) rural poverty study revealed that the number of rural women living in absolute poverty in developing Countries including Nigeria is on the increase[14]. This makes it imperative to determine literally the impact of the ADP on rural women (women contact farmers and women non contact farmers) in Aguata Agricultural Zone of Anambra State, Nigeria. This is anchored on the plat form that the poor is not equally poor and hence, different levels of poverty alleviation measures will be needed to lift them out of poverty. In order to make the women (contact and non contact farmers) to continue to perform their essential roles in agriculture, their poverty levels must be reduced. This study therefore, is hinged on the following specific objectives:

i   to determine the poverty line, incidence ((head count ratio), poverty gap between the rural women contact and non contact farmers in Aguata agricultural zone of Anambra State Nigeria.
ii   to determine the impact of extension packages on rural women contact and non contact farmers' incomes, farm size, labour and fertilizer use levels in the study area. To estimate the socio-economic factors that affect expenditures of rural women contact farmers in the study area.

This research is anchored on the following mill hypotheses:

Ho₁: There is no significant difference in farm income, farm size, labour and fertilizer
        Use levels, between rural women contact and non contact farmers in the study
        Area.
Ho₂: Rural women contact farmers" socio-economic variables (Age of women contact
        Farmers, household size, farming experience, farm size, educational level, labour use levels, farm income) are positively related to farm expenditures.

MATERIALS AND METHOD

The study was conducted in Aguata Agricultural Zone of Anambra State, Nigeria. The area lies between latitudes 6o13' and 7o 9' N of equator and longitudes 7o49' and 7o57'ᴱ of Greenwich meridian.

Aguata Agricultural zone is sandwiched between Akokwa in Orlu South local government area (LGA) of Imo State, Nigeria in the North, Ogbaru in Otuocha LGA of Anambra State, Nigeria in the South, Awlaw in Oji River LGA of Enugu State, Nigeria in the east and on the west by \Umuaku in Umunneochi LGA of Abia State, Nigeria. Aguata agricultural zone, Anambra State, Nigeria is made up of six blocks, namely, Aguata I, Aguata ii, Orumba I, Orumba ii, Orumba iii and Nnewi.

Multi-stage random sampling technique was used in the selection process. First, three out of the six blocks was ramdomly selected. The selected blocks were Aguata ii, Orumba I and Nnewi. Second, one circle was selected randomly, making it 3 circles. The selected circles were umuchu in Aguata ii, Ogboji in Orumba I and Ukpor in Nneni block. Third, 30 rural women contact farmers were randomly selected from each circle bringing the sum to 90. To provide for the non ADP rural women contact farmers, an equal number of rural women non contact farmers weres also selected in the areas where the rural women contact farmers were selected with the assistance of the rural Extension Agents. This therefore brought the grand sample size to 180. Two sets of questionnaires were used to elicit and collect information. A set was administered on the rural contact farmers while a second, on the rural women none contact farmers

The data generated were mostly demographic and those related to input/output coefficients of the improved technologies as well as their prices.

Data in respects of objective I was realized with poverty indicators, objective ii was analyzed with paired "t" test while objective iii was achieved with multiple regression analysis.

The model specification of the poverty indicators include:

$$H = q/n \qquad -\ -\ -\ -\ -\ -\ -\ -\ -\ - (1)$$

Where H = Head count ratio

       q = number of poor rural women (contact and Non contact farmers)
       n = total number of rural women (contact and non contact farmers)

$$I = \{(Z - Y)/Z\} \qquad -\ -\ -\ -\ -\ -\ -\ -\ -\ - (ii)$$

I = Poverty gap (Depth of poverty)
Z = Poverty line estimated
Y = Mean income of the poor rural women farmers in each group.

Paired treatment test (paired't' test) was used according to Nwachukwu and Ezeh (2007) and Ezeh and Nwachukwu (2010) as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\dfrac{S_1^2}{n_1} + \dfrac{S_2^2}{n_2}}} \qquad -\ -\ -\ -\ -\ -\ -\ -\ -\ -\ - (iii)$$

$n_1 + n_2 - 2$ degree of freedom.

Where:

t = paired t statistic
X_1 = Mean parameters of rural women contact farmers
X_2 = Mean parameters of rural women non contact farmers
S_1^2 = Variance of rural women contact farmers
S_2^2 = Variance of rural women non contact farmers.
n_1 = number of selected rural women contact farmers
n_2 = number of selected rural women non contact farmers.
      The multiple regression model is implicitly stated as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, ei) \quad - \; - \; - \; - \; - \; -(iv)$$

Where:

Y = total monthly household expenditures of the rural women contact farmers (₦)

X_1 = age of the rural women contact farmers (years)

X_2 = Household size

X_3 = Farming experience (years)

X_4 = Farm size (ha)

X_5 = Number of years spend in school

X_6 = Casual labour use (man-day)

X_7 = Farm income (Naira)

ei = Stochastic or error term.

The four functional forms (linear, Exponential, Double log and semi log forms) were fitted to the data. The lead equation was selected based on statistical and econometric reasons such as number of significant coefficients, magnitude of the F-ratio and R^2, and the conformity of the variables to a priori expectation.

RESULTS AND DISCUSSION

The mean values of some socio-economic variables are shown in Table 1. The table shows that the mean monthly income of the rural women contact farmers was ₦3167.58 ($21.11) while that of the rural women non contact farmers was ₦2890.08($19.26). This implies that both groups of women farmers were low income earners. This classification is based on the submission of [15,16] that all mean monthly incomes below ₦50, 000.00($333.33) as belonging to low income group. The relatively low farm income status of both groups of rural women farmers has crippling implication on household welfare, farm production and productivity. Table 1 also shows that the mean monthly expenditure of the rural women was #5037.79($33.58) while the rural women non contact farmers expenditures was ₦5027.91($33.51)). The result indicates that both groups of rural women farmers overshot their monthly farm incomes. However, both groups of farmers' expenditures were low. The significantly low proportion of household expenditure suggests the vicious cycle of poverty often engulfing most rural households in Nigerians. Low expenditure and by extension, low investment in agriculture result in low output [15,16].

Table 1 also shows that the mean farm size of the rural women contact farmers was 1.7382 ha while that of the rural women non contact farmers was 1.3335ha. This result is obvious and expected as rural women are not allowed to own or inherent land as of custom in Nigeria. More so, Ezeh and Nwachukwu [17] posited that generally farmers' in Nigeria are predominantly smallholders with average farm size of between 1 and 2 hectares. The result (Table 1) of the labour use level of the rural women contact and non contact farmers indicate that they made use of 6.9259 and 6.1728 of mandays of labour in the farms respectively. These were majorly supplied from their various families.

Table 1 further show that the fertilizer use levels for the rural contact and non contact farmers were 4.2375 and 3.1542bags of 50kg respectively. The low income level of both groups of farmers may have affected the level of investment in improved inputs among the farmers.

Table 1: Mean Values of some socio-economic Parameters of the Rural Women Contact and Non Contact farmers in Anambra State, Nigeria.

Mean Parameter	Women Contact Farmers	Women Non Contact Farmers
Monthly Income (₦)	3167.58	2890.08
Monthly Expenditure ₦)	5037.79	5027.91
Farm Size (ha)	1.7382	1.3335
Labour use (Manday)	6.9259	6.1728
Fertilizer use levels (50kg per bag)	4.2375	3.1542.

Field survey, 2010. (1 USD = ₦ 150)

The poverty indicators of the rural women Anambra ADP contact and non contact farmers are shown in Table 2. The table shows that the poverty line (mean monthly household expenditure) of the rural women contact farmers was ₦5037.79 per month($33.58) or ₦ 60,453.48($403.02) per annum while that of the women non contact farmers was ₦ 5027.91($33.51) per month or ₦ #60,334.92 ($402.23) per annum.

The coefficient of incidence of poverty (Table 2) otherwise called the head count ratio (Ezeh, 2007 and 2009) was 0.444 for the rural women contact farmers and 0.5222 for the rural women non contact farmers [15,16]. This implies that 44.41% and 52.22% of the rural women contact and non contact farmers respectively in Anambra State were poor because their incomes fell short of the mean household expenditure used as poverty line. This result compared favourably with Ezeh[15,16] that obtained 65.5 percent for rural women in Umunneochi in Abia State Nigeria and 53.67% and 32.15% for Fadama II participants and non participants respectively in Imo State Nigeria.

The coefficient of poverty depth (gap) (Table 2) also known as the income shortfall was 0.3712 for the rural women contact farmers and 0.4252 for the rural women non contact farmers. This implies that the poor rural women contact farmers required 37.12% of the poverty line to get out of poverty while the poor rural women non-contact farmers required 42.52% of their poverty line to get out of poverty. This result corroborates with Ezeh (2009) [16].

Table 2: Poverty Indicators of the Rural Women Contact and Non contact farmers In Anambra State, Nigeria

Poverty Line (₦)	5037.79	5027.91
Head Count ratio (poverty Incidence)	0.444	0.5222
Poverty gap (poverty depth)	0.3712	0.4252

Source: Computations form field Survey data.

The results of the paired t – test on some technological input parameters are shown in Table 3. The result shows that the mean farm income of the rural women contact farmers was ₦ 3167.58 ($21.11) while that of the rural women non contact farmers was ₦ 2890.08 ($19.26) and the mean difference was ₦ 277.5($1.85). The paired't' result showed that this is statistically significant at 5.0% risk level because the calculated't' = 2.157 > the tabulated to$_{.025}$ = 2.0. Therefore the null hypothesis is rejected. This result compared favourably with Ezeh[16] who obtained similar result in Imo State between Fadama II and non Fadama II participants. The mean farm size of the women contact farmers was 1.7382 ha while that of the non contact farmers was 1.3335ha and the difference was 0.4047ha. The paired't' result shows that this is statistically significant at 5.0% level because the empirical't' = 2.4277 > tabulated to$_{.025}$ = 2.0. Therefore, the null hypothesis is rejected. This result compared favourably with Nwachukwu and Ezeh [17] who obtained similar result in Abia State. The results (Table 3) of the women contact farmers was 4.2375 50kg bag while that of the rural women non contact farmers was 3.1542, The mean difference was 1.0833 50kg bags. This is statistically significant at 95.0% confidence level because the calculated't' = 2.415 > the tabulated to$_{.025}$ = 2.0. Therefore, the null hypothesis is rejected.

Table 3: Results of the Paired t–test of farm income, Farm size, Labour and Fertilizer use level of Rural Women ADP contact and Non ADP contact farmers in Aguata Agricultural zone of Anambra State, Nigeria.

Paired Categories	Mean	Mean Differences	Standard Deviation	t-value
Z_1	3167.58			
Z_2	2890.08			
Z_1-Z_2		277.5	2.10720	2.157
Z_3	1.7382			
Z_4	1.3335			
Z_3-Z_4		0.40471	1.53767	2.427
Z_5	6.9259			
Z_6	6.1728			
Z_5-Z_6		0.75309	7.03124	0.964
Z_7	4.2375			
Z_8	3.1542			
Z_7-Z_8		1.0833	3.47408	0.415

Source: Computation from field Survey data.
**: Indicates that variable is significant at 5.0% risk level.

Where,

    Z_1 = Mean farm income of rural women contact farmers

    Z_2 = Mean farm income of rural women non contact farmers

    Z_3 = mean farm size of rural women contact farmers

    Z_4 = Mean farm size of rural women non contact farmers

    Z_5 = Mean labour we level of rural women contact farms

    Z_6 = Mean labour we level of rural women non contact farms

    Z_7 = Mean Fertilizer use level of women contact farmers

    Z_8 = Mean Fertilizer use level of women non contact farmers

The multiple regression model results of the factors influencing the expenditures of rural women contact farmers in Aguata agricultural zone of Anambra State ADP is presented in Table 4. All the functional forms were significant at given levels implying that any of the functional forms can be used for predictive purposes. However, the expenditure of the rural women contact farmers was best estimated using the double log functional form, which explained 63.7% of the total variation in the expenditure level of the rural women contact farmers in Aguata agricultural zone of Anambra State, Nigeria at 10% risk level. Also, the double log functional form was chosen as the lead equation based on econometric and statistical reasons such as the number of regression coefficients that are significant, the magnitude of the F – ratio as well as their conformity to a priori expectation.

Specifically, the result shows that the total expenditures of the rural women contact farmers were sensitive to the household size. Though this variable (–1.209) is statistically significant at 1.0% probability level, it is negatively signed. The sign is not in conformity with a priori expectation. Perhaps, increase in household size may not stir up increased expenditure as the members of the household may be matured, economically active and independent.

The coefficient of farm size (1.055) is positive with a standard error of 0.192. This is statistically significant at 1.0% α level (P< 0.01). This implies that as the farm increases in size, there is the increased need for the farm inputs (variable and fixed), hence increase in expenditure. This result agrees with Onwuka, Akinola and Young and Oputa[18,19,20] that the larger the farm, the more quantities of inputs that would be needed in the farm, hence greater investment expenditures.

The coefficient (0.640) of rural women's farm income in the model is positive and statistically significant at 99.0% confidence levels. Expectedly, expenditure of the rural women contact farmers would increase as the resource holding (income) of the women increases and sustained hence, the rural women contact farmers in the study area were indeed displaying rational economic behaviors.

Table 4 Multiple Regression Estimates of Factors that Influence the Expenditures of Women Contact Farmers In Aguata Agricultural zone of Anambra State, Nigeria.

Variables	Functional		forms	
	Linear	Exponential	Double log	Semi log
Constant	3484.84 (5517.086	8.434*** (0.679)	5.601** (2.632)	–29327.71 (15290.181)
Age (X_1)	80.59 (94.475)	–.006 (0.012)	–0.564 (0.0826)	–
Household size (X_2)	45.564 (396.833)	0.0030 (0.004)	–1.209*** (0.255)	209.018 (2077.824)
Farming Exp. (X_3)	–166.205 (149.660)	–0.004 (0.018)	0.704 (0.194)	–170.314 (998.770)
Farm size(X_4)	1563.096 (1422.894)	0.266 (0.167)	1.055ˣˣˣ (0.192)	–876.515 (1504.688)
Labour use Level(X_5)	–13.810	–0.043	–1.120***	1469.593
Edu. Level (X_6)	–177.244	0.003	–0.083	2559.297
Farm Income(X_7)	0.318xxx (0.074)	0.000036*** (0.000)	0.640***(0.126)	3340.561*** (1066.129)
R–square	0.236	0.478	0.637	0.200
Adjusted R–square	0.171	0.412	0.614	0.121
F – ratio	3.620**	8191***	14.069***	2.543**

Source: Computations from Field Survey data.

***, **: Indicate those variables are statistically significant at .10% and 5.0% risk levels respectively.

Figures in parenthesis are standard errors.

CONCLUSION AND RECOMMENDATIONS

The results of this study posted the poverty line of the rural women contact farmers as ₦ 5037.79 ($33.59) while that of the women none contact farmers as ₦ 5027.92 ($33.52). The head count ratio for the rural women contact farmers was 0.444 as against 0.5222 of the women non contact farmers while the poverty gap was 0.3712 for rural women contact farmers and 0.4252 for the women non contact farmers

The result of the paired "t" test indicated that the farm income, farm size, and fertilizer use level of the rural women contact farmers were significantly higher than those of the rural women none contact farmers ($P < 0.05$).

The result of the multiple regression analysis with the double log functional form as the lead equation showed that the critical determinants of rural women contact farmers expenditure level include household size, farm size, labour use level and farm incomes while the value of $R^2 = 0.637$.

Based on the findings, the following recommendations were made:

The scope of the Agricultural Development Programmes (ADP) in Aguata Agricultural Zone nay Anambra State and Nigeria in general should be enlarged to accommodate more willing rural women farmers as evidence had shown that the ADP impacted positively and significantly on some economic indices of the women contact farmers.

Deliberate massive fund injection in the form of loan should be extended to the rural women farmers as evidence had shown that the level of poverty experienced even by the women contact farmers was high. Increased funding has the attendant effect of empowering the women to venture into new fields of agricultural investments such as processing and value addition that would increase their net returns and increase production and productivity.

The governments at all levels (Federal, State and local government) should as a matter of deliberate policy initiate the policy towards the removal of all institutional, customary, and traditional inhibitions to agricultural lands by women farmers. This calls for the full operationalization of the land use Act of 1978. Increased access tos land by the rural women will boost agricultural production and reduce endemic poverty.

REFERENCES

1. Ezeh CI. Poverty Profiles and Determinants of Expenditures of Rural Women Households in Abia State, Nigeria. The Nigerian J Develop Studies. 2007;6 (1):187 – 204.
2. Ajibefun IA, EA Aderinola. Determinant of Technical Efficiency andPolicy Implications in Traditional Agricultural Production: Empirical Study of Nigerian Food Crops Farmers. Final Report for Presentation at the bi–annual Research Workshop of the African Economic Research Consortium (AERC)Nairobi, Kenyg May 29 – June 4, 2004.
3. Igwe PA, CI Ezedimma, CU Nwajiuba. Strategires for financing Nigeria'sPost World Bank Era; A Case study of the ADP Project in Imo State. In A. C. Nwosu and J. A. Mbanasor (eds), Sustanable Agriculture Investment in Nigeria. Proc. Of the 15th Annual Conference of Farm management Association of Nigeria (FAMAN) held at Federal University of Agriculture, Umudike, – 15 Oct. 1997.
4. Kalu MO. Trends in the Funding of Agricultural Development Programme (ADP) in Nigeria; the case of Abia State Agricultural Development Programme 1992 – 1999 B.Sc Thesis. Department of Agriculture, Abia State University, Uturu, 2000.
5. Ezeh CI, CO Emerole, JC Ijioma. Funding, Fund Uses, and Physical Achievements in Abia State Agricultural Development Programme (ADP) 1994. J Res Agricul. 2006;3(1):77 – 82.
6. Obasi R. Success Story of the ADPS. Agriscope: A quarterly News letter of the Federal Department of Agriculture. 1995;14(2):10 – 12.
7. Ezeh CI. The Multiplier Effect of Agricultural Development Programme's(ADP) small Plot Adoption Technique (SPAT) on Small holder Farmers in ABIA State, Nigeria. J Agri Food Sci 2007;5 (1): 41–51.
8. Dimelu MV. Factors Associated with the Effectiveness of Contact Farmers in The Diffusion of Agricultural Innovation in Enugu State. Ph.DThesis, Department of Agricultural Extension, University of Nigeria, Nsukka, 2002.
9. Oriaku SEO. Effectiveness of Agricultural Extension Agents in the Diffusion of Agricultural Innovations in Umuahia Agricultural 2 one of Abia State. M.Sc Thesis. Dept. of Agricultural Economics and Extension, Abia State University, Uturu, 2008.

10.   Adegeye V. A. (1999)lEtiology and Determinants of Poverty Among Rural Women in Oyo States. In poverty Alleviation and Food Security in Nigeria. Fabiyi Y. C. And E. O. Idomu (eds). Nigerian Association of Agricultural Economists (NAAE) . 14–19.

11.   Ezeh CI. The Multiplier Effect of Agricultural Development Programme's (ADP) small Plot Adoption Technique (SPAT) on Small holder Farmers in ABIA State, Nigeria. J Agri Food Sci. 2007;5(1):41–51.

12.   World Bank. Nigeria: Poverty in the Midst of Plenty: The Challenge of Growth and Inclusion. Report No 14733 – UN, (1996).

13.   Ayobatele JI, DA Amudipe. Poverty Profile of Working Women in Akure   North and South LG As of Ondo State.   In Poverty Alleviation and Food Secu-rity in Nigeria   Fabiyi YC and EO Idowu (eds). NAAE Ibadan. 1999, pp. 127–131.

14.   United Nations (NU) (1989) International Definition and Measurements of Standard of Living. New York.

15.   Ezeh CI. The Multiplier Effect of Agricultural Development Programme's(ADP) small Plot Adoption Technique (SPAT) on Small holder Farmers in ABIA State, Nigeria. J Agri Food Sci. 2007;5(1):41–51

16.   Ezeh CI. The Impact of the National Fadama II Development Project in Alleviating Rural Poverty and Improving Agricultural Production in Imo State,Nigeria, Agro- Science: J Trop Agri Food Environ Extension 2009;8(3):139 – 144.

17.   Ezeh CI, IN Nwachukwu. Micro Level Impact of National Fadama 2 Development Project in Imo State, Nigeria. Agri J Food Agri Nutri Develop Kenya. (2010);10(9):4016 – 4031.

18.   Akinola AA, T Young. An Application of the Tobit Model in Analysis ofAgricultural Innosation: A case study of the use of cocoa Spraying Chemicals Amongst Nigerian Cocoa Famers. Agricultural Systems 1991;36: 22–51.

19.   Onwuka OW. Socio – economic Determinants of Inorganic Fertilizer among Small holder Farmers in Abia State, Nigeria. M.Sc. Thesis. Department of Agri–Culture, Abia State University, Uturu, 2005.

20.   Oputa CO. Resource Use and Efficiency of Artisanal Fishing in Oguta LGA of Imo State B. Agric Thesis. Dept of Agriculture, Abia State University, Uturu, 2005.