Agricultural and Socio-economic Impact of Green River Project in Rural Communities of Imo State, Nigeria

Nlerum, F.E. B.I. Isife and C. O. Albert
Department of Agricultural and Applied Economics/Extension,
Rivers State University of Science and Technology, P.M.B 5080,
Port Harcourt, Nigeria. E-mail:frankezi@yahoo.com

ABSTRACT
This study determined the agricultural and social impact of the Green River Project (GRP) in Imo State, Nigeria. The interview schedule was used in eliciting data from a sample size of 90 randomly selected beneficiaries of the Project. Data were analyzed with the impact measuring model, Wilcoxon signed-rank test and percentage. The Project made a higher impact in all the six agricultural indicators studied. The Project also made a higher impact in ten and low impact in nine socio-economic indicators analyzed. There was no significant difference in impact between within and before Project intervention among beneficiaries. The study recommends improvement in storage facilities, supply of farm inputs and delivery of micro-credit to beneficiaries by the Project to increase higher impact and improve areas of low impact in the State.

INTRODUCTION
The Green River Project (GRP) is an agricultural extension programme of the Nigeria Agip Oil Company (NAOC). GRP was established to address the complaint raised by the states of the Niger Delta region that the pollution from oil and gas exploration and exploitation badly affected their ecosystem (Ofuoke *et al.,* 2005 and Amaniyie, 2006). According to the above authors, agriculture which is the major occupation and main source of income to rural indigenes of the Niger Delta states was negatively affected. An earlier study of Nnodim and Isife (2004) reported that many farmlands, economic crops and trees and fishing waters in the region were rendered barren. The resultant effect left the rural people with untold hardship, poverty (Wangbu, 2005) and subsequent poor socio-economic standing.

The Green River Project was established to facilitate the development of a strong food production system among the host communities to the oil and gas exploration and exploitation of the Nigeria Agip Oil Company (GRP 2007). This vision included the promotion of growth in crops, livestock, fisheries and forestry, which were expected to result in a sustained improvement in agricultural production, employment, standard of living and poverty reduction among the members of its host states which are Bayelsa, Delta, Imo and Rivers.

Presently, GRP is responding to the agricultural and socio-economic needs of its clientele in Imo State in line with its objectives, which according to ARMT (1993) are improvement in the traditional agricultural system by means of an extension service, distribution of improved varieties of the main food crops grown in the area and the introduction of new crops of nutritional and economic interest to the people. The GRP objectives were implemented through its designated units which according to GRP (2005) are extension services, plant propagation, soil laboratory unit, livestock, micro-credit, farm mechanization, skill acquisition, fisheries and agro-processing units.

The activities of GRP in Imo State which were aimed at better agricultural production, improved socio-economic status and poverty alleviation of the people are in conformity with the aims of current national and international development agencies (Eni Nigeria News 2007) such as the National Economic Empowerment Development Strategy (NEEDS), National Poverty Alleviation Programme (NAPEP), Niger Delta Regional Development Master Plan (NDRDMP), New Partnership for African Development (NEPAD) and the Millennium Development Goals (MDGs).

Despite the presence of GRP and its subsequent activities to raise the agricultural production capacity and socio-economic condition of its rural host communities, the NDRDMP (2006) reported widespread poverty in Niger Delta with close to 70% of the population living below the poverty line. This study was designed to investigate the extent to which GRP has been able to address the agricultural and socio-economic needs of its rural beneficiaries in Imo state. The study objectives determined the agricultural and socio-economic impact of GRP and the problems faced by beneficiaries. The arising hypothesis was that, there is no significant difference between within and before Project intervention in the agricultural and socio-economic status of Project beneficiaries in the State.

RESEARCH METHODOLOGY

This study was carried out in Imo State, Nigeria which lies within latitudes 4^0 45´N and $7^0$15´N and longitude $6^0$50´E and $7^0$25´E with an area of around 5,100 square kilometers and bordered by Abia State on the east, Rivers Niger and Delta State on the west, by Anambra State to the north and Rivers State to the south (Imo State-Wikipedia, 2011). Agricultural production is the major occupation of the people. Yam, cassava, maize and rice are the major staple food crops. Oil palm is its main cash crop. Petroleum and gas in the state made possible the presence of the Nigerian Agip Oil Company and hence the Green River Project.

Data for the study were collected with the interview schedule which elicited data for five years before and five years of participating in the Project. The sample size was 90 beneficiaries who were randomly drawn from the list of beneficiaries of the Project. Thirty respondents were sampled from the communities of Egbema, Ohaji and Oguta by enumerators who were previously trained for this purpose.

Analyses of data were achieved with the impact evaluation measuring model, Wilcoxon signed-rank test and percentage.

The impact measuring model of Freeman *et al.,* (1979) which was cited by Nwachukwu (2008) states that the impact (O_1) of a project is determined by the score on measurement after intervention (E_2) minus the score on measurement before intervention (E_1). The model is mathematically present as:

$O_1 = E_2 – E_1$ … 1. Where O_1 = Impact, E_2 = Score of variable achieved within project participation and E_1 = Score of the same variable achieved before project participation.

As a decision rule, positive outcomes from the above model were read off as higher impact, while negative outcomes were read off as low impact for each variable. Impact for farm size, wet cassava root and maize grains per beneficiary were estimated in football fields, the farmers' full bags and full head pans respectively. These were converted into tonnes per season as follows:

i) *Farm Size:* Two football fields were approximated to be equal to one hectare. The total football fields achieved by all respondents were converted into hectares by dividing by two. The outcome was then divided by the total number of respondents to obtain the mean farm size per respondent.

ii) *Wet cassava root:* A farmer's full bag weighed 100 kilogramme (0.1 tonne). This value was used to multiply the total number of bags produced by all respondents. The outcome was then divided by the total number of respondents to obtain the mean in tonnes of wet cassava root per respondent in a year.

iii) *Maize grains:* One full head pan weighed 10 kilogrammes (0.01 tonne). This value (0.01tonne) was used to multiply the total head pans produced by all respondents and divided by total respondents to obtain the mean in tonnes of maize grains produced by a respondent in a year.

The Wilcoxon signed-rank test which was used for hypothesis testing is mathematically presented as:

$$Z = \frac{T - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}}$$

where: T = Absolute sum of negative rank of difference in variables before and within participation in the Project.

N = Number of variables (25 variables in this case)

Z = Wilcoxon test value (impact)

RESULTS AND DISCUSSION

Findings in Table 1 show that the Project recorded a higher impact in 16 and low impact in 9 out of 25 agricultural and socio-economic indicators studied. Specifically, the Project made a high impact of 1.88 hectares as the mean farm size per participating farmer. This result agreed with that of Ajayi and Ogba (2006) where the intervention of the Water Aid Project (WAP) led to an increase in farm size per participant from 3.8 hectares before Project to 4.6 hectares after. The WAP impact value of 0.8 hectares on its beneficiaries however was lower than the impact of 1.88 hectares made by GRP on its own beneficiaries. The result further indicated a higher impact of over two animals per herd size of sheep and goat per farmer. All other agricultural variables as shown in Table 1 indicated higher impact of the Project among the studied beneficiaries.

Socio-economically, out of the five variables studied under household equipment purchased by beneficiaries, the Project made low impact in four as in Table 1. Higher impact was however achieved in one variable (mobile phone purchase). This appears to imply that the Project is assisting beneficiaries foster a better means of communication among themselves, the Project's Extension Officers and the world around them. Also, out of the five variables studied under mobility purchased, the Project made low impact in bicycle and motor cycle and a higher impact in canoe, engine boat and any four-wheeled vehicle. This higher mean impact in vehicles purchased agreed with the findings of Ashimolowo *et al.,* (2005), where 17.5% of small scale farmers were able to purchase cars of their own following an intervention with a micro credit scheme extended to them. These farmers had 0% in car purchase before the micro-credit scheme intervention according to the above authors.

Table 1: Project Impact on Agricultural and Socio-economic Variables in Imo State

Variables	Achievement		
	Before Project (1997-2002) (E_1)	With Project (2003-2008) (E_2)	Impact (O_1)
Agricultural			
Mean farm size per farmer (counted in hectares)	0.94	2.82	1.88
Mean sheep/goat size per farmer (herd count)	2.56	5.43	2.87
Mean fishpond number per farmer	0.11	1.53	1.42
Mean annual yield of wet cassava root per farmer (tonnes)	2.77	5.91	3.14
Mean annual yield of maize grain per farmer (tonnes)	0.39	0.71	0.31
Mean number of membership in farmers co-operative society	0.26	1.00	0.74

Socio-economic			
Household equipment purchased (item count)			
Radio	69	10	-59
Television	44	22	-22
Video machine	36	28	-8
Set of upholstery chairs	28	22	-6
Mobile telephone	9	32	23
Mobility purchased (item count)			
Bicycle	44	6	-38
Motor cycle	18	6	-12
Canoe	15	22	7
Engine boat	5	8	3
Any four-wheeled vehicle	10	11	1
Shelter built (item count)			
Mud/thatch house	22	10	-12
Mud/zinc house	22	16	-6
Block/zinc house	26	24	-2
Gathering materials for block/zinc house construction	16	25	9
Savings and investment (item count)			
Opened Bank Account	11	18	7
Opened Fixed Deposit Account	10	16	6
Purchased Share	9	22	13
Participate in Contribution (n*tu*)	15	19	4
Purchased Land	12	21	9

Source: Field Survey, 2009

Further socio-economic results in Table 1 indicate that low impact was recorded in three out of the four variables studied under shelter built. High impact was recorded in the gathering of materials for construction of block/zinc houses among the Project beneficiaries. This appears to mean that if the Project is sustained, more beneficiaries would acquire enough financial resources to gather building materials that would result in the construction of modern houses of their own in agreement with the findings of Ashimolowo *et al.,* (2005) where built houses ranged from unplastered to painted after participating in a micro-credit intervention in their farming enterprise. The above authors showed that houses were not built by the same farmers before their exposure to the micro-credit scheme.

Table 1 also showed that the Project made higher impact on beneficiaries in all the five variables studied under savings and investment. These are opened bank account, opened fixed deposit account, purchased share, participated in contribution (*ntu*) and purchased land. This finding suggests that the Project is assisting in increasing the economic activities of its beneficiaries in Imo State.

Table 2: Summary of Wilcoxon Signed-Rank Test Showing Differences in Impact Within and Before Project Activities

Subject	Ranks	Number of Variables (N)	Sum of Ranks	Mean Rank	Wilcoxon Test Statistics
Impact within minus (-) impact before Project activities	Negative	9	174	19.33	
	Positive	16	228.5	14.28	
	Ties	0			
	Total	25			
Z (calculated)					0.3091
Z (tabulated)					0.4989

Source: Field Survey, 2009. Alfa = 0.05

Table 2 showed that Zcal (0.3091) was less than Ztab (0.4989) at an alfa level of 0.05. Given this non significant result, we accepted the null hypothesis and concluded that there was no significant difference between within and before Project intervention in the agricultural and socio-economic status of the Project beneficiaries in Imo State. This result implied that, although the Project intervention resulted in the achievement of more positive impact in 16 variables as against a negative impact in 9 variables, out of the 25 variables that were studied, the magnitude of the positive impact was not high enough to result in a mean that would bring about significant change in the agricultural and socio-economic status of the respondents.

Table 3: Percentage Distribution of Militating Problems of Beneficiaries of the Project in Imo State (n=90)

S/No	Problems	Percentage (%)
1.	Poor crop output of Project introduced new species	24.4
2.	Poor income from Project introduced new species	34.4
3.	Late arrival of supplied Project inputs	57.8
4.	Poor quality of Project supplied farm inputs	52.2
5.	Inadequate supply of inputs by Project	70.0
6.	Inadequate market for farm products	67.8
7.	Insufficient storage facilities for farm products	71.1
8.	Inaccessibility to Project micro-credit facilities	70.0
9.	Insufficient contact with Project Extension Officers	54.4
10.	Incompatibility of recommendation with existing farming system	41.1
11.	Inadequate farmers' participation in technology selection	41.1

Source: Field Survey, 2009. Multiple responses were used.

Table 3 indicated that the highest problem faced by Project beneficiaries as indicated by 71.1% of the respondents was insufficient storage facilities for their farm products. This finding agreed with the study of Isife, *et al.,* (2006). Next were inadequate supplies of inputs by the Project as indicated by 70.0% and inaccessibility to the Project's micro-credit facility as also indicated by 70.0% of the respondents. The effect of these major problems and others explain why there was no significant difference between within and before Project intervention in the state.

CONCLUSION AND RECOMMENDATION

The Green River Project has shown evidence of higher impact in the agricultural and socio-economic status of its beneficiaries in Imo State in all the six agricultural indicators examined in this study. Out of the nineteen socio-economic indicators analyzed, the Project made a higher impact in ten and a low impact in

nine. The result of the test of hypothesis showed no significant difference in impact between within and before Project intervention. The study recommends efforts that would increase the magnitude in values of its achieved higher impact and improvement in its area of low impact. Improvement in the storage facilities of farm products, supply of farm input and delivery of micro credits by the Project would increase the magnitude of its higher impact among beneficiaries.

REFERENCES

Amanyie, V. (2006). *The Struggle of the Niger Delta, Nigeria*. Owerri, Springfield Publishers Limited, pp. xvi-xviii.

ARMTI, (1993). Agricultural and Rural Management Training Institute, Quarterly Monitoring Project on Nigerian Agip Oil Company (NAOC) – Green River Project. Ilorin, Nigeria. October to December, 1993, pp 1-27.

Ashimolowo, O.R, L.A Akinbile and E.A. Afolayan (2005). Effect of Micro-credit on Small Scale Crop Farmers in Odeda Local Government Area of Ogun State. Proceeding of 10th Annual National Conference of Agricultural Extension Society of Nigeria. (14-17 June, 2005) at Badegi, Niger State Nigeria, pp. 86-91.

Eni Nigeria News (2007). "Community Development". *In-house Journal of,* Nigerian Agip Oil Company (NAOC) Limited, Nigeria Agip Exploration (NAE) Limited and Agip Energy and Natural Resources (AENR), Limited, July-Sept. 4 (2):11-15.

Freeman, H. E., P. H. Rossi, and S. R. Wright (1979). *Evaluating Social Projects in Developing Countries*. Organization for Economic Co-operation and Development.

GRP (2005). Green River Project, Nigerian Agip Oil Company Limited, Impact Evaluation, April, 2005, 117 p.

GRP (2007). Green River Project, 12th Nigerian Agip Oil Company (NAOC) – GRP Farmer's Day Celebration, December 1st 2007, pp 1-6.

Imo State-wikipedia (2011). The Free Encyclopedia, en.wikipedia.org/wiki/Imo_State, Accessed on 2nd of February, 2011.

NDRDMP (2006). Niger Delta Regional Development Master Plan, The Popular Version, Niger Delta Development Commission, pp 1-25.

Nnodim, U. A and B. I. Isife, (2004). "Assessment of Shell Petroleum Development Company Extension Services in Etche Local Government Area of Rivers State, Nigeria". *Journal of Agriculture and social Research,* www.inap. Info/ajol, 4(2): 19-23.

Nwachukwu, I. (2008). *Planning and Evaluation of Agricultural and Rural Development Projects.* Umuahia, Lamb House Publishers, Nigeria, 74 p.

Ofuoku, A. U., J. U. Agbamu, G. N. Emah and A. U, Nnodim (2005). "Youth Restiveness in Delta State as Perceived by Community Development Committees and Implications for Agricultural Development". *Journal of Agriculture and Social Research,* 5 (2): 27-35.

Wangbu, J. (2005). *Niger Delta: Rich Region, Poor People.* Enugu, Snaap Press Limited, Nigeria, pp 1-156.