

Volume 4, No. 1, April, 2013

Journal of Sustainable Technology JoST

# JoST

ISSN: 2251-0680



## Journal of Sustainable Technology

Volume 4, No. 1, April, 2013

### CERAD

CENTRE FOR RESEARCH AND DEVELOPMENT  
THE FEDERAL UNIVERSITY OF TECHNOLOGY,  
AKURE, NIGERIA.

[www.jost.futa.edu.ng](http://www.jost.futa.edu.ng)



## Comparative analysis of adoption of agricultural technologies of green river project by farm families of Niger Delta, Nigeria

NLERUM, F.E.

Department of Agricultural and Applied Economics/Extension, Rivers State University  
of Science and Technology, P.M.B. 5080, Port Harcourt, Nigeria.

**ABSTRACT:** This study compared the rate of adoption of the agricultural technologies of Green River Project by farm families of the Niger Delta region of Nigeria. Stratified and random sampling methods were used in selecting a sample size of 270 respondents. Data collection was with the interview schedule. Data were analyzed using percentage and analysis of variance. Results indicate that out of the 14 studied agricultural technologies, adoption rate was more amongst farm families of Bayelsa State (57.6%) followed by Imo (57.0%) and lastly by Rivers (55.2%). Cassava/maize/egusi-melon intercropping system was the highest adopted technology with a percentage mean rate of 97.0%. The least adopted technologies in the region were bee keeping (23.3%) and snail rearing (27.8%) respectively. There was no significant variation in adoption among the three studied states. The study recommends improvement is adoption of bee keeping and snail rearing.

**Keywords:** Agricultural technologies; green river project; farm families; Niger delta.

JoST. 2013. 4(1): 82-87.

Accepted for Publication, April 22, 2013

### INTRODUCTION

In a broad sense, technology is the body of specific knowledge, the organizations and procedures, the machinery, tools, the necessary material inputs and human skills that are combined to produce socially desired products. Ogunrinde (2006) sees technology as a term associated with all ways and manners in which discoveries and inventions in science are put to use to satisfy mans need and desire. It is important to state here that technology is a necessary input to increase productivity in all fields of human endeavour of which agricultural production is one.

Given the above explanation of what technology is, agricultural technology therefore is the application of scientific techniques that would satisfy human needs and desires in control of the development, yield, preservation and

processing of agricultural products. Today, world security issues are tied to the level of technology in agriculture (Ogunrinde, 2006). He added that the food security status of any nation is to a large extent tied to the level and type of agricultural technologies that are developed and available to the people. In Nigeria, the over twenty-two agricultural research institutes have played host to several agricultural technologies that have enhanced discoveries and inventions that have led to improvement in the production of crops, agro-forestry, livestock and fisheries. The ultimate test of success for agricultural technology generation and transfer system according to Stoop (1998) is the extent of technology adoption by the clients. This assertion by Stoop (1998) is corroborated by the work of Issa (2006) which showed that farmers

\*Correspondence to: Nlerum, F.E.; frankezi@yahoo.com

in Lagos State, Nigeria adopted agricultural technologies which were delivered to them through research efforts. In view of the foregoing, it is needful to state that agricultural research efforts in themselves are valueless in a development context if they are not extended to farmers who are the end users.

In order to ensure its research efforts were extended to farmers, the Green River Project (GRP), an agricultural extension outfit of the Nigerian Agip Oil Company (NAOC) Limited, has been in liaison with research institutions to deliver agricultural technologies to farm families located in their area of coverage in the Niger Delta region of Nigeria. Despite the activities of

GRP, food insecurity still prevails in the area. The research questions arising from the problem of this study were what are the agricultural technologies of interest to the Project and to what extent has the project successfully transferred its technologies of interest to the farm families in the states? The objectives of the study identified the agricultural technologies transferred by the project, and determined the extent of adoption of each identified technology in the studied states of the region. The arising null hypothesis from the study is that, there is no significant variation among the farm families in the adoption of the agricultural technologies of the Project in the Niger Delta States of Nigeria.

## METHODOLOGY

This study was carried out in the Niger Delta region which is located in the southern part of Nigeria. The nine states of the region are Abia, Akwa-Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo and Rivers. These states are divided into 185 Local Government Areas, 5,000 communities, 40 ethnic groups and speaking 250 dialects (NDDC, 2004). The population of the region according to the 2006 national population census is 27,783,551 people (The Guardian, 2007).

The Niger Delta region of Nigeria is rich in natural resources such as crude oil and gas and accounts for about 90% of earnings from oil and gas and about 60% of federally distributed revenue (NDDC, 2006). In addition to crude oil and gas, Allison-Oguru, *et al.*, (2006) added that the region is also endowed with numerous renewable natural resources, thus making its economy essentially natural resources based. Cropping, fishing, lumbering and non-timber forest products exploitation and related secondary economic activities constituted the main source of livelihood for at least 65% of the inhabitants. A fertile land which supports an all

year round agricultural production is supportive to the rural economy of the people of the Niger Delta region. These qualities of the region must have motivated the Nigerian Agip Oil Company to empower its host communities with the Green River Project.

Multistage sampling involving the stratified and random sampling methods were used in drawing the sample size of 270 respondents out of the 2,700 direct participants in the project as at the time of the survey for the study. The breakdown of the multistage method of stratified and random samplings were carried out in this respect. Firstly, stratified sampling was employed to group the activities of Green River Project into states and communities. Secondly, the random sampling was used in selecting Bayelsa, Imo and Rivers States out of the four states in which GRP is operational in the Niger Delta region. Thirdly, random sampling was also used to select three communities each out of the three selected states to make a total of nine communities. The three selected communities from Bayelsa State were Brass, Obama, and Tebidaba. For Imo State, Egbema, Ohaji and Oguta were selected and for

Rivers State, Mgbede, Obrikom and Omoku were selected. Fourthly, random sampling technique was further used in drawing thirty (30) beneficiaries from each of the nine communities to make the total of 270 respondents. This sample size represented 10% of the study population which is statistically acceptable for scientific researches. The lists of communities and beneficiaries of GRP were obtained from GRP land and swamp offices located in the study area. The interview schedule which was the instrument used for primary data collection was administered by enumerators who were previously trained by the researcher.

Data obtained from the field were analyzed with the Statistical Package for Social Sciences (SPSS), version 15 and Excel 2007. The measurement of variables used for data analyses were as described. Adoption index for each agricultural technology was obtained by dividing its total frequency of occurrence by the total respondents and multiplying by 100 percent (%) as done by Adeniji *et al.*, (2005), Nlerum (2005) and Afolami and Anyawale (2007). Furthermore, a percentage mean adoption index

for each state was obtained by summing the adoption index for each agricultural technology to have the total adoption percentage scores and dividing this score by the number of studied technologies, which are 14 in this case. The inferential statistics used for the test of the study hypothesis was Analyses of Variance (ANOVA) of the F-statistics. The test was done by inputting the obtained percentage adoption index for the states in the ANOVA model with the result interpreted as appropriate.

Fourteen agricultural technologies of the Project were identified and studied in all. The technologies were cassava/maize/egusi intercropping system, yam minisett production, plantain/banana cultivation, pineapple cultivation, mechanization of soil tillage/on-farm transpiration of farm products, introduction of agro-forest crops and snail production. Others were bee keeping, rearing of sheep and goats, swine production, poultry production, fishpond construction and management, farm products preservation, processing and utilization and book keeping.

## RESULTS AND DISCUSSION

Table 1 showed that fourteen agricultural technologies were primarily carried out by the project. A closer look at Table 1 shows that the project technologies captured almost all the major aspects of the field of agriculture such as crop, agro-forestry, livestock, fishery, farm mechanization, agricultural economics and food science and technology. The results also showed a good replication of the technologies in all the states. This implies that the project is well packaged to address the problem of food insecurity and poverty of its participants. The results further showed that the most adopted of the technologies was cassava/maize/egusi intercropping system with 97.0% mean rate of

application. Imo State had highest rate (97.7%) of application. The next technology was yam minisett production with 94.1% mean rate of adoption with Bayelsa as the highest (95.6%) adopting state. The third most adopted technology with 84.8% mean rate of application was plantain/banana cultivation. Its rate of adoption of 85.6% was the same for both Bayelsa and Rivers State.

The two least adopted agricultural technologies based on the mean result, among the three states as indicated by 23.3% and 27.8% of the farm families were bee keeping and snail rearing respectively. Nevertheless, the findings showed that the mean adoption status of the Project was

**Table 1: Percentage Distribution of Current Status of Adoption of Agricultural Technologies by Farm Families in the States**

S/No	Agricultural Technologies	Percentages Per State			Mean %
		Bayelsa (n=90)	Imo (n=90)	Rivers (n=90)	
1.	Cassava/Maize/ Egusi Intercropping system	96.7	97.7	96.7	97.0
2.	Yam Minisett Production	95.6	93.3	93.3	94.1
3.	Plantain/Banana Cultivation	85.6	83.3	85.6	84.8
4.	Pineapple cultivation	43.3	41.3	44.4	43.0
5.	Mechanization of Soil tillage/On-farm transportation of farm products	54.4	55.6	53.3	54.4
6.	Introduction of Agro-forest crops	41.1	48.9	41.1	43.7
7.	Snail rearing	35.6	23.3	24.4	27.8
8.	Bee keeping	32.2	18.9	18.9	23.3
9.	Rearing of sheep and goats	61.1	63.4	60.0	61.5
10.	Swine production	40.0	36.7	38.9	38.5
11.	Poultry production	47.8	48.9	46.7	47.3
12.	Fishpond construction and management	61.1	66.7	60.0	62.6
13.	Farm products preservation, processing and utilization	70.0	73.3	68.9	70.7
14.	Book keeping	42.2	46.7	40.0	43.0
	<b>Scores of total adoption percentage (%)</b>	<b>806.7</b>	<b>798.0</b>	<b>772.2</b>	<b>792.3</b>
	<b>Mean adoption percentage (%)</b>	<b>57.6</b>	<b>57.0</b>	<b>55.2</b>	<b>56.6</b>

Source: Field Survey, 2009; Multiple response was used

highest (57.6%) among Bayelsa State farm families. This was followed by Imo State with 57.0% rate of adoption and lastly by Rivers State with 55.2% rate of application. These results showed close similarity in adoption among the states. This tends to imply that the Project's extension activities gave equal or close to an equal attention to the farm families in the three states. Besides this, the study indicated that

the current mean adoption status of the Project among the three studied states was 56.6%. This showed that the Project's adoption status was higher than that of the Rivers State Agricultural Development Programme with an adoption status of 28.7% as revealed by an earlier study of Nlerum and Agumagu (2008).

Table 2 showed that the columns which indicated the variation in adoption among the states

revealed that F-ratio (1.70) was less than F-critical (3.37) at a P-value of 0.203. These values showed that the adoption of the Project's agricultural technologies among the three states did not vary significantly. Given this result, the hypothesis that, there is no significant variation among the states in adoption of the

Project's agricultural technologies was accepted. This conclusion implied that the adoption of the Project's agricultural technologies among the farm families of the three studied states were similar. This finding implies that the Project's effort in the three studied states were the same.

**Table 2: ANOVA Showing Variation in Adoption of Agricultural Technologies Among the Three States**

Sources of Variation	SS	Df	MS	F- ratio	P-value	F-crit
Rows (Technologies)	12.42	13	0.96	18.23	7.87	2.12
Columns (States)	0.18	2	0.09	1.70	0.203	3.37
Error	1.36	26	0.05			
Total	13.96	41				

Source: Field Survey, 2009; Alpha level = 0.05.

## CONCLUSION AND RECOMMENDATIONS

Comparatively, this study revealed a very close similarity among the farm families in the adoption of the agricultural technologies of the Green River Project in the studied states. However, the highest adopted technology in the three states was cassava/maize/egusi-melon intercropping system. This was closely followed by yam miniset production. The study further revealed

that the two least adopted technologies in the states were bee keeping and snail rearing respectively. The current mean adoption status of the Project is above the average. The study recommends improvement in the adoption of bee keeping and snail rearing among the farm families.

## REFERENCES

- ADENIJI, O.B., J.P. VOH and OGUNGBILE, A.O. (2005).** "Factors Influencing Adoption of Cotton Production Packages in Katsina State". *Nigeria. Journal of Agriculture and Social Research*, **5**(2):92 – 99.
- AFOLAMI, C.A. and ANYAWALE, A.O.S. (2007).** "Adoption Rates of Improved Maize Production Technologies in Ogun State Agricultural Development Programme Zones of Nigeria". *International Journal of Food and Agricultural Research*, **4**(1&2): 222-234.
- ALLISON-OGURU, E.A, IGBEN, M.S. and CHUKWUIGWE, E.C. (2006).** "Optimum Combination of Rice Monocrop and Cassava Based farm Enterprises Consistent with Farm Household's Food Requirements in the Central Niger Delta. A Linear Programming Approach". *Acta Agronomica Nigerian*, [www.agricolanig.org](http://www.agricolanig.org), **7**(1) 69-75.
- ISSA, F.O. (2006).** "On-farm Adaptive Research and Small Plot Adoption Technique as Strategies for Agricultural Technology Delivery in Lagos State, Nigeria". Proceedings of 11th Annual Conference of Agricultural Extension Society of Nigeria, 3rd – 6th of April 2006, pp. 249-256.
- NDDC (2004).** Niger Delta Development Commission at a Glance, Port Harcourt, pp 3-10.
- NDDC (2006).** Niger Delta Development Commission. *Making a Difference in the*

- Niger Delta*. Corporate Affairs Department, Port Harcourt, pp. 20-22.
- NLERUM, F.E. (2005)**. “Adoption of Yam Minisett Technology by Yam Growers in Ikwerre Local Government Area of Rivers State, Nigeria. *Journal of Agriculture and Social Research*, **5**(2): 1 - 5.
- NLERUM, F.E. and AGUMAGU, A.C. (2008)**. “Level of Yam Minisett Technology Adoption by Farming Communities in Emohua Local Government Area of Rivers State, Nigeria. *International Journal of Pure and Applied Science*, **1**(4):104-107.
- OGUNRINDE, S.I. (2006)**. Agricultural Technological Needs in 21st Century Nigeria and its Implication for Agricultural Education”. Proceedings, of 11<sup>th</sup> Annual Conference of Agricultural Extension Society of Nigeria, 3rd – 6th of April, 2006, pp. 82-92.
- STOOP, W.A. (1998)**. NARS Linkages in Technology Generation and Technology Transfer Working paper No. 11. International Service for National Agricultural Research (ISNAR). The Hague, Netherland, pp. 1-2.
- THE GUARDIAN (2007)**. “Council of State Okays Census Figure”, Wednesday January 10, **23**(10274):1.