



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

ECONOMICS OF PLANTAIN PRODUCTION IN OIL PRODUCING COMMUNITIES OF BAYELSA STATE, NIGERIA

P.E. Kainga, C.D.Nnadi, S.P. Jimmy, and K.S. Ugorji

Department of Agricultural Economics, Extension & Rural Development, Niger Delta University, P.M.B. 071, Wilberforce Island Bayelsa State. Corresponding author's Email: princekainga@yahoo.com

Abstract

This study examined the economics of plantain production in oil producing communities in Bayelsa State with a view to ensuring a green economy. The specific objectives were to: describe the socio-economic characteristics of plantain producers, determine the socio-economic variables that influence productivity in plantain production, determine the technical efficiency in plantain production, estimate cost and return associated with plantain production, identify constraints faced by plantain farmers in the study area. To materialize this, 60 structured questionnaire from 6 oil producing communities were selected and data were analysed using descriptive statistics and multiple regression. The results showed that greater number of the plantain farmers fall within an age bracket of 39-59 years, with an average age of approximately 40 years. Majority of the plantain producers were female, this showed that plantain production is a female crop in the study area. The result also showed that greater number (65 %) of farmers used family labour; the involvement of skilled labourers (educated youth) may be attributed to lack of employment in oil producing companies. The result further showed that the estimated average farm size in the study area was less than 1 hectare which connotes that the farmers were operating on small scale farming, with an estimated average output of 300 bunches of plantain per year. Major determinants of productivity in plantain production in oil producing communities were farm size, sex of farmer and labour in harvesting plantain as they were statistically significant ($p \leq 0.05$)

Keywords: Economics, plantain production, oil producing communities, Bayelsa State

Introduction

Plantain (*Musa spp*) is one of the most important staple food crops grown in the tropics and sub-tropics of the world (Frison, 1997; Faturoti *et al.*, (2007). Plantain occupies an important role in rapid food production. Its mature fruit (ripe or unripe) are consumed boiled, baked, pounded, roasted or sliced and fried into chips, overripe plantain are processed into beer or spiced with Chile pepper, fried with palm oil and served as snacks. Industrially, plantain fruits serve as a composite in the making of baby food (FDA (2000).

Most plantains are produced by small scale farmers who often do not have the financial resources for sustainable production due to high labour cost. Oil exploration and extraction activity has led to adverse environmental hazard on the soil, forestry, aquatic life and water of the Niger Delta communities. This has ultimately affected peasant agriculture leading to low output and environmental toxicology. Landless farmers migrated to other communities in search of fertile land for farming, thereby putting pressure on scarce fertile lands in other communities, and creating reduction on fallow land, while displaced farmers out-migrated to the urban areas in search of other means of livelihood and urban jobs (Elliot, 1998). Flaring of natural gas has also been identified as having negative impact on surrounding vegetation (Isiche and Stanford, 1976).

In the Niger Delta region of Nigeria according to (Kadafa, 2012) oil exploration activities has adversely reduced the fertility of soil/land resources, crops, livestock, forest and vegetation. The negative effect of oil resource extraction on the environment of the Niger Delta region cannot be overemphasized. According to Eteng (1997) and Central Bank of Nigeria (C.B.N) (1981), "Oil exploration and exploitation has impacted disastrously on the socio-physical environment of the Niger Delta oil-bearing communities, threatening the peasant economy in terms of fishing and farming, and hence the entire livelihood. Gbadegesin (1997) further noted that oil spills have led to extensive deforestation with no adequate replanting practices there by shortening fallow periods, compounded land use degradation and consequently loss of soil fertility and erosion of the top soil. Thus the development and distribution of crude oil resources in Bayelsa State of the Niger Delta region has created significant environmental and socio-economic constraint which has also resulted in so many conflicts among the youth. The existence of these oil companies and industries may have resulted to high labour

cost thereby affecting agricultural productivity. The ultimate result of these impacts could be drastic reduction in farm productivity and farm income.

Nevertheless, the development of the agricultural sector within a degraded environment lies within the purview of Green economy concept. UNEP (2011) defined Green economy as one that results in improved human wellbeing and social equity, while significantly reducing environmental risk and ecological scarcities. IFPRI (2012) defined green economy as an economy that pursues growth while also promoting sustainable development through efficient use of resources. Under this domain. The broad objective of this study was to examine the economics of plantain production in oil producing communities in Yenagoa Local Government Area of Bayelsa State. The specific objectives were to: describe the socio-economic characteristics of plantain producers.; determine the socio-economic variables that influence productivity in plantain production; determine the technical efficiency in plantain production; estimate cost and return associated with plantain production; identify constraints faced by plantain farmers in the study area.

Methodology

Study Area

The study was carried out in Yenagoa Local Government Area of Bayelsa State. Bayelsa State is geographically located within latitude 04° 15 North, 05° 23 South and longitude 05° 22 West and 06° 45 East. The state shares common boundaries with Delta State on the North River State on the east and the Atlantic Ocean on the West and South. It is a heavy tropical rain forest region of African where such crops as yam, cassava, maize including plantains are grown abundantly. This state covers an area of about 21,110 square kilometres; more than three quarter of this area is covered by water. The vegetation here is characterized by mangrove forest, and fresh water swamps (Bayelsa State Council of Arts and Culture 2006). Yenagoa local government is made up of seven clans which include Okordia, Atissa, Zarama, Bisene, Gbaran, Ekpetiama and Epie clan. The main languages spoken in Bayelsa State are Izon, Nembe, Ogbia and Epie/Atsisa. The predominant occupation in the state are fishing, farming, palm oil milling, lumbering, palm wine tapping, local gin making, trading, carving and weaving (Bayelsa State Council of Arts and Culture, 2006).

Two-staged sampling technique was used. The first stage involved random selection of six oil producing communities in Yenagoa Local Government Area, while the second stage involved random selection of ten (10) plantain farmers in each of the 6 communities chosen. This gave a total sample size of 60 plantain farmers. The data collected were analysed using descriptive statistics such as frequency distribution and percentages. Other tools used were production function and multiple regression models.

Model Specification:

Four functional forms were used in the regression analysis. They included linear, semi log, double log and exponential functions. In other to determine the best fit of the relationship between socio-economic variables and productivity in plantain production in oil producing communities in Yenagoa L.G.A. of Bayelsa State, it was assumed in this study that output of plantain (in kg) is a function of the farm size (in hectare), labour for land preparation (in man-day), labour for sucker planting (in man-day), labour for weeding, (in man-day), labour for fertilizer application (in man-day) labour for harvesting (in man-day), capital investment in (₦), sex of farmer, age of farmers, experience and educational qualification employed in the production process.

Functional relationship was given as

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + \dots + b_{11} X_{11} + C$$

Where

Y	=	Output of plantain in (kg)
X ₁	=	Farm size (hectare)
X ₂	=	Labour for land preparation in (man-day)
X ₃	=	Labour for sucker planting
X ₄	=	Labour for weeding in (man-day)
X ₅	=	Labour for fertilizer application in (man-day)
X ₆	=	Labour for harvesting in (man-day)
X ₇	=	Capital investment (Naira)
X ₈	=	Age of farmer (Years)
X ₉	=	Sex of farmer

X ₁₀	=	Farmer's experience (Years)
X ₁₁	=	Educational qualification
R ²	=	Coefficient of determination

Results and Discussion

Socio-Economic Characteristics of Farmers

The result shows that greater number of the plantain farmers fall within an age bracket of 36-59 years. The average age of the farmer was approximately 46 years. Majority of the plantain producers were female (51.7%), this shows that plantain production was a female crop in the study area. Table 1 indicates that 10% of the farmers used hired labour, 25% used family labour and 65% used both family and hired labour. The result showed that both types of labour were frequently used. Labour employed in Man-day to prepare the land, planting of sucker, weeding and harvesting; showed that 64 (man-day) was the highest.

A good number of the farmers surveyed were illiterates; and are seen as unskilled labourers. The involvement of skilled labourers (educated youth) may be attributed to lack of employment in oil producing companies or industries in the study area. The result further showed that the estimated average farm size in the study area was less than 1 hectare which indicates that the farmers are operating on small scale farming operation, with an estimated average output of 300 bunches of plantain per year, and sold for an average of ₦600.00 per bunch. The result showed that if given the desired economic incentive with efficient use of labour and farm size, plantain production in the study area could be profitable.

The household size of the farmers surveyed in the study area is shown in Table 1 below. The average percentage of the household size falls within the size bracket of 7-8; the result showed that 48% of the farmers can rely on family labour. The table showed that 48.3% of the farmers operate on full time and 51.7% operate on part time. The result showed that greater percentage of the farmers were not full time farmers; they engage on other activities (Table 1)

Education provides the farmers with skills and attitude necessary to improve farm management, technologies aimed at improving his standard. The table showed that 51.7% of the farmers had primary education, 23.3% had secondary, 11.7% had tertiary and 13.3% had no educational background. Thus the farmers could not be totally ignorant if specialized training skill were offered to them (Table 1).

Cost and Returns Associated in Plantain Production

In Table 2 below, average fixed cost of the plantain farmer surveyed was estimated at ₦33,900.00. This amount represents expenses on wheel barrow, spade, machete etc. Total variable cost of plantain farmer surveyed was estimated at ₦500.00. This represents expenses on sucker used, and labour activities etc. From the foregoing analysis average total cost of production of farmers surveyed was estimated at ₦83,400.00. The plantain farmers surveyed in the study area realized average gross revenue of ₦180,000.00. This amount represents the gross receipt from sales of plantain and it was measured in bunches since the accurate measurement in tons were not taken. Net income generated was ₦96,600. The result on net income implies that despite the high cost of labour, in the study area, if given the right or desired economic incentives, it can serve as a major source of employment and income.

Socio-Economic Variables that Influence Economics of Plantain Production

The result showed that double log function had the best fit, with a coefficient of determination of 61% and was chosen. It means that socio-economic variables such as farm size, labour used in land preparation, labour used in sucker planting, labour used in weeding, age of farmer, sex of farmer, farmers experience, educational qualification, capital investment, labour used in harvesting influence 61% of the variation in the productivity in plantain production in oil producing communities. However, the major determinants of plantain production in oil producing communities were farms size, sex of farmer and labour used for plantain harvesting, as they were statistically significant at 5% level. (t = 3.484, -3.923 and 2.323 respectively-Table 3).

Technical Efficiency in Plantain Production

Results from the regression output (Table 3) showed that a one unit increase in farm size will lead to 0.286 tons of plantain output. A one unit increase in labour for harvesting will lead to a reduction in output per naira by 0.037, while a one unit increase in sex of farmer as female will lead to reduction in output per naira by 0.515. The results further showed that 1 unit increase in farm size could positively yield 0.286 tons of plantain output.

Constraints of Plantain production From Table 4 below 13.33% of plantain production was constrained by high labour cost; while 40%, 14% and 10% was attributed to inadequate capital, oil spillage and illiteracy level respectively. The result showed that high cost of labour, oil spillage and illiteracy level were the major constraints faced by plantain farmers and thus affected the productivity of the farmers.

Conclusion and Recommendation

In Nigeria today plantain production is becoming a significant economic activity for income generation. Plantain producers and Farmers alike, if given the desired economic incentive, plantain production could be a strategic economic stimulant in a green economy. Oil exploitation activities have degraded fertility of most of our rural lands, forestry and wildlife thereby leading to low output in production; therefore there is need for government to develop the rural areas. Income generated from oil exploitation activities should be ploughed into development of farming in the area as plantain production is profitable. Innovation and technologies should be adopted to improve the agricultural system. Issues of productivity in plantain production in oil producing communities should be centered on farm size as it was positive and statistically significant at ($p \leq 0.05$). *More especially as* Plantain production is still very much in the hands of small scale farmers. Nevertheless, the study showed that plantain productivity or output could be increased. Therefore, government should encourage small scale farmers, landless farmers, provide adequate infrastructure; workshop training to access improved technologies, innovation and research findings on plantain production. Non-governmental organizations, banks and other financial agencies should assist farmers through the provision of credit, subsidies and other incentives with little collaterals to enhance the productivity of farmers as a means of sustaining a green economy. International Institute of Tropical Agriculture (IITA) should also complement with improved varieties of plantain suckers to boost plantain production in oil producing communities.

References

Central Bank of Nigeria (C.B.N) 1981. Annual Report.

FAO (2006) Food and Agricultural Organizations FAO Stat (2006). Statistic Division 2006. Food and Agricultural Organization of the United Nations.

Fatureti, B.O., M.C. Madukwe, A. Tenkouano and A.E. Agwu (2007): "A review of policy acts and initiatives in plantain and banana innovation system in Nigeria" Africa Journal of Biotechnology Vol. 6(20) pp 2297 – 2302 18 October 2007 Available Online at <http://www.academicjournals.org/AJB>.

Federal Department of Agriculture (2000): Plantain and Banana Development Programme (FDA) Training Workshop on Plantain and Banana Production for the South East Zone 9th March 2000.

Frison, E.A. (1997): Towards a Musa Improvement Programme, Musafrika, Vol. 11, p 5 International Institute for Tropical Agriculture, Ibadan.

Elliot, L. (1998) "The Global Politics of the Environment" New York University Press, U.S.A

Eteng, I. A. (1997) "The Nigerian State, Oil Exploration and Community Interest: Issues and Perspectives" University of Port Harcourt, Nigeria.

Gbadegesin, A. (1997) "The Impact of Oil Exploration and Production Activities on the Environment: Implications for Peasant Agriculture" Seminar Paper on Oil and The Environment organised by Friedrich Ebert Foundation's in Port Harcourt.

IFPRI (2012) Global Food Report. A publication of International Food Policy Research Institute Washington DC, USA.

Isiche, A.O and Sanford, W.W (1976) "The Effect of Waste Gas Flares on the Surrounding Vegetation of South-eastern Nigeria" Journal of Applied Ecology Vol. 13.

Kadafa, A.A (2012) "Environmental Impacts of Oil Exploration and Exploitation in the Niger Delta of Nigeria" Global Journal of Science Frontier Research Environment & Earth Sciences Volume 12 Issue 3 Version 1.0

Table 1: Socio-economic Characteristics of Respondents

Variables	Frequency	Percentage (%)
Age of Respondents		
≥25	3	5.0
26-39	17	28.3
40-59	29	48.3
60 and above	11	18.3
Gender of Respondents		
Female	36	51.7
Male	24	48.3
Marital status		
Single	4	6.7
Married	50	83.3
Divorced	0	0
Widow	6	10.0
Religion of Respondent		
Christianity	59	98.3
Islam	0	0
Pagan	1	1.7
Household Size		
3-5	23	38.4
6-8	27	45
9-11	5	8.3
12 and above	2	3.3
Hectare/cultivated by farmers		
0.2 - 0.4	6	17.5
0.4 - 0.6	18	45.3
0.6 - 0.8	29	20.3
0.8 - 1.0	4	0.8 - 1.0
1.0 and above	2	2.8
Labour type		
Hired labour	7	10
Family labour	16	25
Both	37	65
Cultural activity participated in		
Land preparation	4	64
Planting of sucker	4	40
Weeding	4	40
Harvesting	2	30
Educational level		
Primary	31	51.7
Secondary	4	23.3
Tertiary	7	11.7
None	18	13.3

Source: Field survey data 2013

Table 2: Estimated cost and returns of plantain production

Items/activities	Number owned	Cost/Return (₦) Unit	Total cost ₦
A Fixed cost (Production cost)			
Wheel barrow	2	9000.00	18,000.00
Spade	3	1700.00	5,100.00
Machete	8	9,00.00	7,200.00
Hoe	3	1,200.00	3,600.00
Sub-total			33,900.00
B Labour cost (variable cost)	Number of people		
Land preparation			
Planting of sucker	4	N3000.00	12,000.00
Weeding	3	N2,500.00	7,500.00
Harvesting	4	N3,000.00	12,000.00
Transportation	2	N1,500.00	3,000.00
Sucker used	2	N500.00	1,000.00
	700 units	N20.00	14,000.00
Sub-total			49,500.00
Total cost of production (A + B)			83,400.00
C Gross revenue	300 bunches (₦600 per bunch)	180,000.00	
D Net income C - (A+B)		180,000.00 -83,400.00	96,600

Source: Field survey data 2013.

Table 3: Result of Estimated Regression at 5% level of significance

Variable	Linear form	Exponential	Double *log	Semi log
Constant	275.435	5.445	5.575	23452
Farm size	30.182* (3.622)	0.104* (3.829)	0.286* (3.484)	74.119* (2.824)
Labour for land preparation	-1.641(-1.114)	-003(-0.072)	-0.166(-0.900)	-53.904(-0.914)
Labour for sucker planting	16.374(1.270)	0.071(1.693)	0.324(0.269)	9.933(0.362)
Labour for weeding	-132(-0.014)	-0.006(-0.194)	0.023(0.269)	9.933(0.362)
Labour for harvesting	0.003(0.600)	9.581 E-006 (0.611)	-0.037* (2.323)	10.082(1.991)
Capital investment	0.003(0.751)	6.651E -006(0.557)	-0.044(-0.412)	-3.449(-0.101)
Age of farmer	-2.064(-0.111)	-0.016(-0.166)	-0.113(-0.413)	-28.496(-0.325)
Sex of farmer	-101.132 * (-3.391)	-0.334* (-3.449)	-0.515* (-3.923)	-159.72*1(-3.803)
Farmers experience	4.975(1.876)	0.010 (1.137)	0.059(-1.366)	26.625(1.924)
Educational qualification	-23.081(-1.414)	-0.034(-0.638)	-0.112(-0.984)	-56.407(-1.541)
R ²	0.556	0.570	0.606	0.559
F-ratio	6.130	6.504	7.535	6.204

Note:*Significant at 5%.The value in parenthesis is the t-statistics. Double log functional form was chosen based on the criteria for choosing best fitted equation; with the highest value of coefficient (R²) Source: Field survey data 2013.

Table 5: Constraints of plantain production

Constraints	Frequency	Percentage
High labour cost	22	33
Inadequate capital	18	40
Oil spillage	7	14
Pest and disease	3	3
Illiteracy level	10	10
Total	60	100.00

Source: Field survey data, 2013