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## ECONOMIC ANALYSIS OF PINEAPPLE PRODUCTION IN AHIAZU MBAISE LOCAL GOVERNMENT AREA OF IMO STATE, NIGERIA

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**Abstract:** The study examined the economics of pineapple production in Ahiazu Mbaise Local Government Area, Imo State, Nigeria. It specifically examined the socioeconomic characteristic of pineapple famers; reassessed the influence of respondent's socioeconomic factors on production output, estimated costs and returns and identified the constraints militating against pineapple production in the study area. Primary data used for this research were collected through the aid of structured questionnaire simple random sampling was used to select 50 respondents. Finding on the socio-economic characteristics showed that about 50% of the farmers were males; majority of them fell within the age bracket of 41-50 years. Majority (76%) were married 50% attained tertiary institution, 54% had household size between 6-10 persons, majority of the farmers (76%) had 10 years of experience in pineapple production, (68%) with farm size ranging between 0.6-1.0 hectare. The study proved that the enterprise is profitable given the positive values of gross margin (₦659, 640), net farm income (₦466, 480) and net return on investment (0.83). Using multiply regression, the production output indicated that farm size; cost of labour and fertilizer had statistical and significant influence on production output while others like age, house hold size, gender, level of education and marital status had no statistically and significant influence on production output. The constraints of pineapple production are lack of extension service, lack of information on modern technology; poor storage facilities etc. For more efficient production, farmers should form cooperative society to enable them negotiate for credit facilities, provide modern storage facilities etc.

**Keywords:** Socio-Economic Characteristics of Pineapple Farmers, Production Output, Gross Margin, Net Farm Income, Net Return on Investment and Constraints of Pineapple Production.

### INTRODUCTION

In most developing countries, agriculture is seen as a means of reducing dependence on certain imports, earning foreign exchange, absorbing many new entrances to labour market and increasing farm income (Diana, 2008). Nigeria has a total land area of about 98.3 million hectares out of which 71.2 million hectares (72.4%) are cultivatable but only 32.2 million hectares are under use (Daramole, 2004). Pineapple (*Ananas Comosus*) is one of the imported commercial fruit crops. It is the leading edible member of the family Bromeliceal (Food and Agricultural Organization, 2005). Pineapple is native of South Brazil and Paraguay where wild species occur. The crop was brought by Indians to England in 1660. According to (Ubi, Ekpe, Igwe and Ibori, 2005) pineapple is drought tolerant and well adapted to tropical acid soil with P.H ranging from 4.5 to 6.5 and the crop is propagated by new vegetative growth. Pineapple has oval to cylindrical shaped fruit, develops from many fruits fused together. The fruit is both juicy and fleshy with the stem serving as the fibrous core (Sampson, 1986). Pineapple is used mainly as food in the form of shackers and fruits juice, while the fermented juice is used to make vinegar and alcohol spirit. Pineapple is a good source of vitamins A<sub>1</sub>, B<sub>1</sub>, B<sub>6</sub> and C, copper, manganese, and dietary fiber (Meteljan, 2007). Its juice consumption provides immunity against fever parasite (Hasegawa, Fony and Kelthy, 1996).

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Nigeria produces about 6% (14.220 metric tons) out of the total world production in 2001 taking the lead as the highest in Africa (Martyns, 2008). The country has the presence of suitable ecological zone for its production but low capacity utilization of resources or inefficient allocation of resources by pineapple farmers in the country has led to decline in pineapple production. However, government has made efforts to improve the production of pineapple. One of the programs developed by Nigerian government is the Nigerian national forestry resources and its management for sustained yield (Anum, 1996 Akalusi and Chomini, 2006). With alley cropping, pineapple suckers can be integrated (Akalusi, and Chomin, 2006).

### **OBJECTIVES OF THE STUDY**

The broad objective of this study was to access the economics of pineapple production in Ahiazu Mbaise L.G.A. of Imo State, Nigeria. The specific objectives are to:-

- i. describe the socio-economic characteristics of the pineapple farmers in the study area;
- ii. determine the effect of socio-economic characteristics of the respondents on pineapple output;
- iii. determine the profitability of pineapple; and
- iv. identify major problem militating against pineapple production in the study area.

### **Review of Related Literature**

The reviews of related literature will be undertaken under profitability of pineapple, effects of socio-economic characteristics of the farmers on the output and the constraints of pineapple production.

#### **Profitability of Pineapple Production**

Livingstone and Ord. H. (1981) explained that production in agriculture are carried out under condition of uncertainty and also costs of production were frequently not known for certain before hand and may vary with output and it can also affect unit profit. Every production process needs to be considered in the framework of cost and returns since one of the aims of farm business is to make profit. Ezeh (1991) in his study of pineapple production buttressed that for a profitable production, the entrepreneur should minimize the use of resources inputs so as to lower production cost and maximize yields thereby increasing productivity and revenue. It is on record that farmers should be educated on the optimal combination of inputs for economic optimum outputs. Okolo and Ifere (1985) examined the pattern of cost and returns potential of pineapple with the use of multiple regression analysis. Livinus (1985) determine the cost and returns of pineapple production using profit function. According to Adinya et. al. (2006) in their study of economic meltdown and pineapple production, pineapple alley-based cropping system of production of small farmers was profitable but farmers were inefficient in production of pineapple.

#### **Effects of Socio-Economic Characteristics of Pineapple Farmers on Output**

Kalivagan (1981) and Fujimo, (1998) reported that labour, farm size, fertilizer and adoption of improved alley cropping system has positive influence on output of pineapple production. This is because large sizes of farm results to low cost of input and high output while fertilizer when used adequately enhance growth of pineapple hence resulting in high yield and farmers income.

### **Constraints to Pineapple Production/Marketing**

Hiremath (1993) noted that the absence of processing facility, absence of cold storage facility, fluctuations in prices were the major problems expressed by pineapple farmers. Also inadequate storage facilities results to serious wastage of food and also increase cost accrued to consumers in many parts of the world.

### **RESEARCH METHODOLOGY / STUDY AREA**

The study was carried out in Ahiazu Mbaise Local Government Area Imo State, Nigeria. The Local Government Area was created in 1976. It has a population of 170, 902 as at the 2006 population census and an area of 114 km<sup>2</sup> (National Population Commission, 2006). It is located at latitude 7°5' and 7°5' North of the equator and longitude 90° and 90° 61 South of the equator. The area has a comparative advantage in the production of pineapple and it's known for its farming prowess. Ahiazu Mbaise Local Government Area is made up of fourteen (14) towns namely, Ahiara, Agu na Eze, Amuzi, Lude, Nnarambia, Ogbe, Oru, Otulu, Ekwereazu, Ihite-Afor-ukwu, Mpam, Obohia, Okpala na Dim and Umuokirika. It has a tropical climates and experiences two seasons' rainy season and dry season. The temperature ranges from 25.5°C-32.5°C. It experiences about 3,000 mm of rainfall per annum, and this makes the area suitable for agricultural production.

### **POPULATION AND SAMPLING PROCEDURE**

The study population comprised of pineapple farmers in the five towns in Ahiazu Mbaise L.G.A. of Imo State. Fives from the fourteen (14) towns were randomly selected from the the L.G.A. The list of pineapple farmers in the five selected towns were compiled and used for the sampling frame. Ten (10) pineapple farmers were selected from each of the five towns and this gave a total of 50 pineapple farmers that were utilized for the study.

### **METHOD OF DATA COLLECTION**

Primary and secondary data were collected by administering a well structured questionnaire to the respondents, while secondary data were collected from conference proceedings, annual reports, workshop papers, bulletins, journals, textbooks, magazines etc. Primary data were collected on socio-economic characteristics, output and input variables, and their current prices and problems militating against pineapple production in the area.

### **MEASUREMENT OF VARIABLES**

A reasonable number of variables will be deployed in the study and they include socio-economic variables, production variables and constraints of pineapple production.

### **CONSTRAINTS TO PRODUCTION**

The Likert scale was used to determine the degree of seriousness of pineapple production problems. The responses from the correspondents was ranked in the following order- very serious=3, serious 2, and not serious = 1

Determination of cut off point (critical mean) is given as:-

$$X = \frac{\sum f}{n} = \frac{3+2+1}{3} = \frac{6}{3} = 2$$

### **METHOD OF DATA ANALYSIS**

Analysis of data was based on the specific objectives of the research. Descriptive statics, percentages, frequency distributions, and ratios were used to analyze the data so as to achieve objective (I) and (IV) while multiple regression analysis were used to analyze the data to

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achieve objective (II) and objective (III) was achieved through the use of gross margin analysis to analyze the data.

### Gross Margin and Net Farm Income Analysis

Gross margin was used to determine the profitability of pineapple production in the study area. It is specified as

$$GM = TR - TVC$$

$$NFI = TR - TC (TVC+TFC)$$

$$NROI = \frac{NFI}{TC}$$

Where GM = Gross Margin

TR = Total Revenue

TC = Total Cost

TVC = Total Variable cost

TFC = Total Fixed cost

NFI = Net Farm Income

NROI = Net Return on Investment.

### Multiple Regression Analysis

This was used to express the casual relationship between the dependent variable and independent or explanatory variables. The value of the coefficient of multiple regressions ( $R^2$ ) was used to measure the ability of the independent variables to explain variation in dependent variable. The greater the  $R^2$  the greater the percentage of variation in the dependent variables influenced by the independent variable. The closer the  $R^2$  is to zero (0), the worse the goodness of fit to the equation to data. The implicit form of the regression model used to explain the effects of socio-economic factors of the respondents on production output as well as to determine the magnitude of inputs parameters employed to calculate the respective marginal value product of the inputs is given as

$$Y = F (X_1, X_2, \dots, X_n; e)$$

Where:-

$X_1, X_2, \dots, X_n$  = independent variable,

e= error term.

The data were fitted to four functional forms and tried. Their explicit experiences are stated as:-

Linear: Y

$$\text{Linear function: } Y = b_0 + b_1 X_1 + b_2 X_2 + \dots + b_n X_n + e$$

Exponential function:

$$\ln Y = b_0 + b_1 X_1 + b_2 X_2 + \dots + b_n X_n + e$$

Semi-logarithm function

$$Y = b_0 + \ln X_1 + b_2 \ln X_2 + \dots + b_n \ln X_n + e$$

Double logarithm function:

$$\ln Y = \ln B_0 + b_1 \ln X_1 + b_2 \ln X_2 + \dots + b_n \ln X_n + e$$

For the effects of socio-economic variables on output, the variables are represented as:-

OTP = output (kg)

AGE = age (years)

HOS = household size (number)

EDU = educational level (years)

- EXP = farming experience (years)  
 GEN = gender (dummy; if male= 1 female=0)  
 FAS = farm size (M<sup>2</sup>)  
 COI = Cost of input (₦)

**RESULT AND DISCUSSIONS**

The results of the study will be discussed under the following sub headings; socio-economic characteristics of pineapple farmers, profitability of the production, effect of socio-economic characteristics of respondents on production output and constraints to pineapple production.

**Socio-Economic Characteristics of Pineapple Farmers**

The study describes the socio-economic characteristic of the respondents which include: - age, gender, marital status, household size, farming experience, level of education, farming status and farm size.

**Age Distribution of the Respondents**

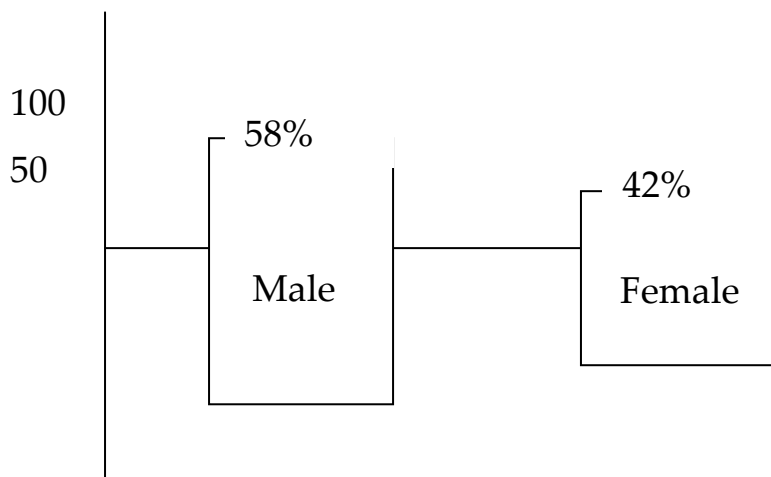
The age distribution of the respondents is shown in table 1. The result showed that majority (58%) were within the age bracket of 41-50 years, 28% were between 31-40 years, while only 14% of the respondents were between 21-30 years. The result implied that pineapple famers in the area were mainly youths. This impacted positively on productivity and output on pineapple production in the study area.

**Table 1: Age Distribution of the Respondents**

Age (Year)	Frequency	Percentage %
21-30	7	14
31-40	14	28
41-50	29	58
<b>Total</b>	<b>50</b>	<b>100</b>

*Source:* Field Survey, 2013.

**Diagram 1: Gender Distribution of the Respondents**



*Source:* Field Survey, 2013.

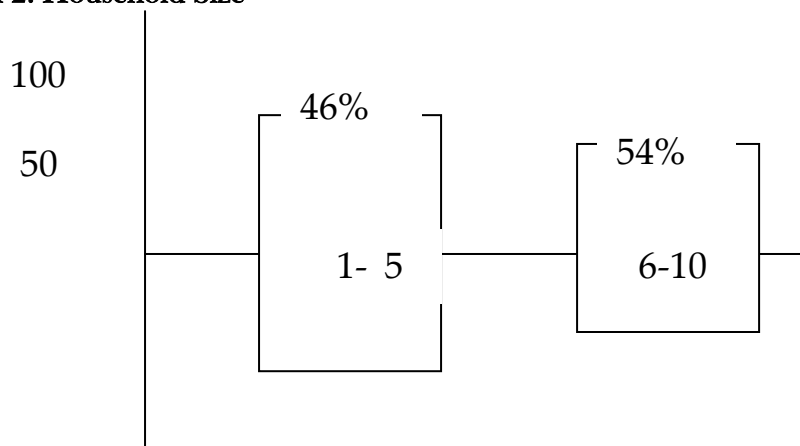
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Diagram 1 showed the gender distribution of the respondents. The male respondent's has 58% while female respondent had 42%. The male dominated production due to existence of inheritance that allowed only male to inherit their father's land.

### Household Size of the Respondents

The household distribution of the respondents is presented in diagram 2.

Diagram 2: Household Size



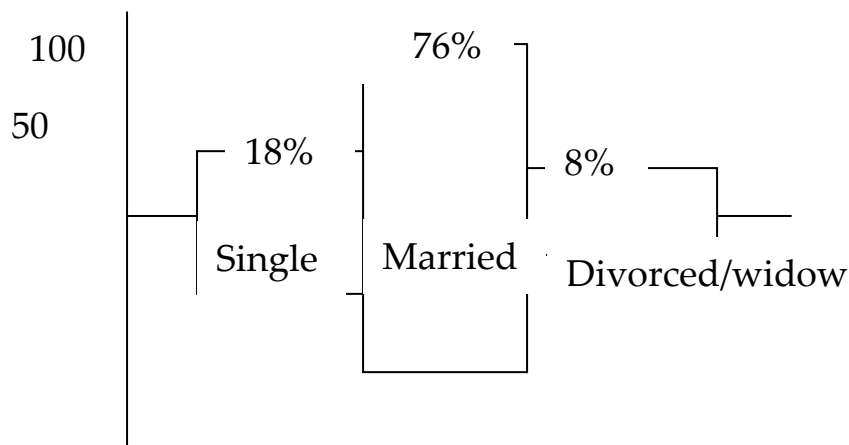
*Source:* Field Survey, 2013.

The result showed that (54%) had households size of 6-10 persons whereas 46% of the respondents had household size of 1-5 persons. The increased household size would result in the use of family labour in the farming activity. It would have positive effects on production output.

### Marital Status of the Respondents

The marital status of the respondents are shown in diagram 3

Diagram 3: Marital Status of the Respondents



*Source:* Field Survey, 2013.

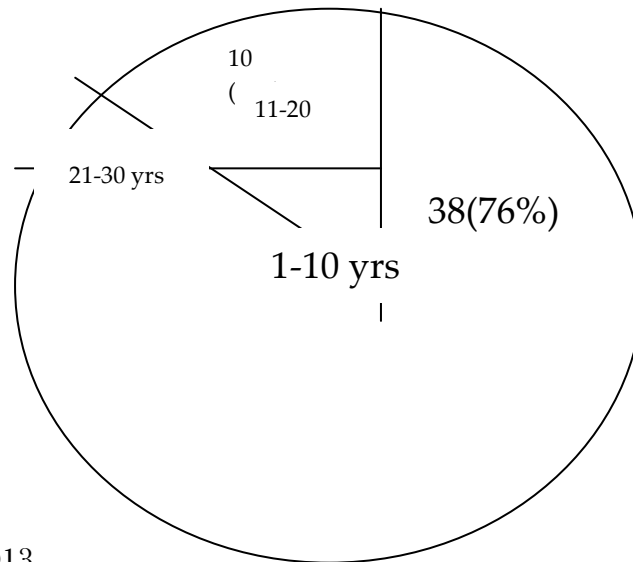
For marital status, 18% of the respondents are single, 76% of the respondents are married while 8% of the respondents are divorced/widowed. This correspond with the household size

distribution diagram 2 which indicated that majority 54% had household size between 6-10 persons in the household.

**Years of Farming Experience of Respondents**

The distribution of respondents by level of farming experience is presented in diagram 4.

**Diagram 4: Farming Experience of the Respondents.**



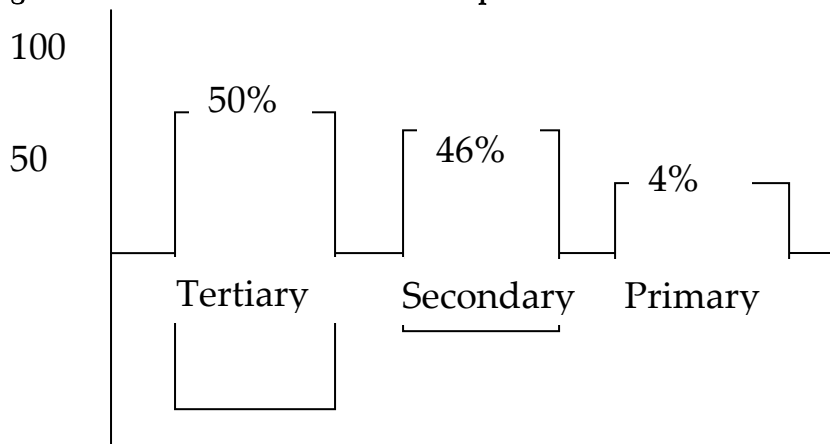
*Source:* Field Survey, 2013.

The result showed that the majority (76%) has experience in pineapple production between 1-10 years, 20% had experience between 11-20 years and the least 4% had between 21-30 years. The result showed that majority of respondents had lesser year of experience in pineapple production.

**Educational Level of the Respondents**

This is known as numbers of years an individual spent in school. Diagram 5 showed that majority of the respondents 50% had attended tertiary institution, 46% had secondary education while 4% had primary education.

**Diagram 5: Educational Level of the Respondents**

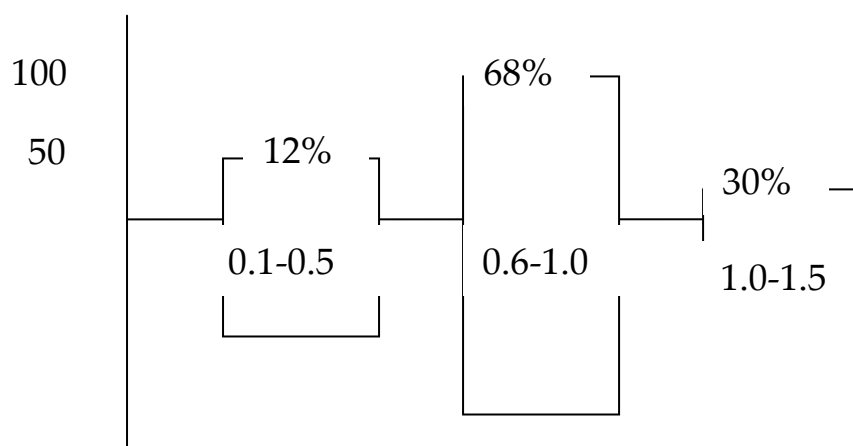


*Source:* Field Survey, 2013.

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### FARM SIZE DISTRIBUTION OF RESPONDENTS

Diagram 6: Farm Size Distribution of the Respondents

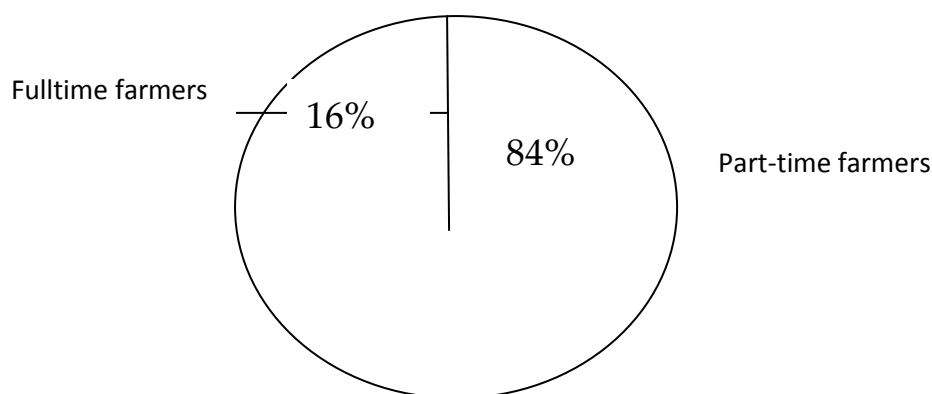


*Source:* Field Survey, 2013.

Diagram 6 shows the distribution of farm size of the respondents in the study area. The result showed that majority (68%) had a farm size between 0.6-1.0 hectares, 30% had between 1-1.5 hectares and the least 12% had 0.1-0.5 hectares. This result implied that majority of the farmers were small scale farmers.

### FARM STATUS OF THE RESPONDENTS

Diagram 7: Farm Status of the Respondents



*Source:* Field Survey, 2013.

Diagram 7 indicated that 84% of the pineapple farmers are part-time farmers' whereas 16% are full time farmer. The part time farmers engage in pineapple production to help support the meeting up of household needs.

### Profitability of Pineapple Production in the Area

The profitability of the enterprise was assured by means of gross margin and net farm income method. The result of the analysis is presented in table 2. From the table 2, it would be seen that the total variable cost constituted 65% of the total cost of producing pineapple in the area. The remaining 35% was the fixed costs. The major cost variable was cost of labour (30%) of the total cost, followed by cost of fertilizer (24.5%) and pineapple sucker (24.35%) respectively and the least annual depreciation value of hoe is (1.45%). Furthermore, it indicated that the farmers



realized gross margin, net farm income and net return on investment value of ₦659, 640, ₦466, 480 and 0.83 kobo on every ₦100 invested in the enterprise respectively. By this, the pineapple production in the area was profitable.

### Effects of Socio-Economic Characteristics of the Respondents on the Pineapple Production Output

Multiple regression analysis was used to predict the effect of socio-economic factors on production output. The independent variables were farmer's age represented by (AGE), house hold size (HOS), level of Education (EDL).

**Table 2: Estimated Profits for Pineapple Farmers' in the Area**

Variables	Amount ₦	Percentages
Total Revenue (TR)	1,028,220	
Pineapple sucker	87,200	24
Fertilizer	92,900	25
Cost of labour	109,400	30
Transportation	39,600	10
Chemicals	40,480	11
Total variable cost (TVC)	368, 580	65
Fixed cost		
Matchet	30,910	
Wheelbarrow	110,000	
Basin/basket	18,010	
Spade	22,240	
Hoe	12,000	
Total fixed cost (TFC)	193,160	35
Total cost (TFC+TVC)	561,740	
GM (TR-TVC)	659,640	
NFI (TR-TC)	466,480	

Net Return on Investment (NFI/TC) 0.83.

Gender (GEN), farm size (FAS), cost of input (COI) and marital status (MAS). The data output and socio-economic variables were fitted with four functional forms of linear, exponential, semi-log and double. Log and were ran with MINITAB statistical software. The output were shown in table 3 and values of the parameters estimate indicated that of linear regression were best in terms of numbers, size and sign of + - ratio, and values of R-square, R-square (adjusted), F-statistic, and Durbin - Watson statistic and was chosen as the lead equation.

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**Table 3: Estimated Determinants of Production Output**

Parameter	Linear	Exponential Coefficient	Semi-log Coefficient	Double-Long Coefficient
Constant	-2300 (-1.40)	20159 (19.78)	-381 (-0.26)	1.6235 (2.49)
AGE	2.113 (0.59)	0.001644 (0.74)	-671.3 (0.95)	-0.2027 (-064)
HOS	6.90 (0.34)	-0.000225 (-0.03)	125.7 (0.34)	0.1692 (1.02)
GEN	-30.65 (-0.49)	0.00491 (-0.13)	14.89 (0.43)	0.00758 (0.49)
EDU	3.371 (0.64)	0.008031 (245)*	12.69 (0.42)	0.01713 (1.28)
MAS	0.695 (0.81)	0.002109 (0.90)	295.9 (1.02)	0.1236 (0.96)
FAS	489.45 (5.00)*	0.25131 (4.15)*	632.0 (2.04)*	0.9951 (3.76)*
COI	0.06647 (4.91)*	0.00002402 (2.87)*	544.5 (2.04)*	0.3408 (2.87)*
FER	-0.024133 (-3.73)*	0.00000346 (0.86)	-73.49 (-1.68)	-0.03355 (-1.7)*
R <sup>2</sup>	83.5%	83.5%	54.6%	775.9%
R <sup>2</sup> (adjusted)	80.9%	80.5%	47.4%	72.1%
F-statistics	32.32%	31.42%	7.66%	20.08%
D-wat-stat	1.9	1.47	2.35	1.99

**Source:** Field Survey, 2013. Note: \*Significant at 5% Level, D-Wat-Stat-Durbin-Watson Statistic.

### Constraints to Pineapple Production

The constraints of pineapple production were shown in table 4. The problem of inadequate extension service ranked 1<sup>st</sup> will mean score of 3.9. This is followed by lack of information on modern technologies whereas fluctuation of prices is the least constraints.

**Table 4: Constraints of Pineapple Production**

CONSTRAINTS	MEAN	RANK
Inadequate extension service information	3.9	1 <sup>st</sup>
Lack of modern technology	3.8	2 <sup>nd</sup>
Poor storage facilities	3.0	3 <sup>rd</sup>
Pest, disease and weed infestation	2.4	4 <sup>th</sup>
High cost of agro chemical	2.3	5 <sup>th</sup>
High cost of input	2.3	6 <sup>th</sup>
Lack of credit facilities	2.2	7 <sup>th</sup>
Fluctuation of prices	2.1	8 <sup>th</sup>

**Source:** Field Survey, 2013.

### CONCLUSION AND RECOMMENDATIONS

Pineapple production in Ahiazu Mbaise Local Government Area of Imo State, Nigeria was a profitable business. The findings of the studies showed that inadequate extension service, lack of information on modern technologies, and poor storage facilities identified by the studies as the most serious constraint to pineapple production in the area.

### RECOMMENDATIONS

Based on the findings, the following recommendations were made:-

1. Government should increase the number of extension agents under their service. This would broaden the provision of extension service on modern pineapple production technologies readily available and easily adaptable.
2. Farming practice should be transformed through the use of technologies that stabilize yield. These technologies require improved crop variants that are highly resistant to pest and disease.
3. The farmers should form cooperatives societies to enable them procure inputs at cheaper rate, negotiate for credit facilities, provide modern storage facilities for their products and derived other advantage of cooperation.

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