

## **Analysis of Profitability in Pepper (*Capsicum spp*) Production in Ogba/Egbema/Ndoni Local Government Area, Rivers State, Nigeria**

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### **Abstract**

*The study was centered on analysis of profitability in pepper (*Capsicum spp*) production in Ogba/Egbema/Ndoni Local Government Area, Rivers State, Nigeria. The study utilized multistage sampling to select 172 farmers in the study area. Structured copies of questionnaire were appropriated in eliciting information from the farmers. Out of the 172 copies of questionnaires dispatched, only 160 were retrieved. Data for the study were analysed using frequency count, percentages, mean score, farm budgeting model, and multiple regression. The result showed that 69.4% of the marketers were female while 30.6% were male. In the same vein, 57.5% farmers were majorly within the age range of 31-43 years and 50.6% of these farmers were married. Contrastingly, while 100% of the farmers used agrochemicals in their farming operation, the 100% did not apply fertilizer in their farms. Results from the farm budgeting model showed that average annual net farm income (profit) was ₦59,234.52 for 0.12 hectares. The average gross farm income realized per annum stood at ₦180, 8250, the variable cost was ₦407,665.6 and the estimated gross margin was ₦1,400,584 per annum. Results from mean score analysis showed that the most dominant constraint was flooding with a mean score of 3.91875 greater than the 2.5 benchmarks. Following these findings, the study recommended that government should encourage unemployed youths to go into pepper production so that the gap between demand and supply can be narrowed.*

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**Keywords:** *Pepper production; Pepper farmers; Profitability*

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## INTRODUCTION

Nigeria grows over 200 selections of pepper; the crop is massively produced from the Northern States even though that it grows well in the South West States (Idowu-Agida et al., 2012). The nutritional value of pepper merits special attention. It is a rich source of vitamin A and E. Both hot and sweet peppers contain more vitamin C to prevent flu colds than any other vegetable crop (Boseland & Votava, 2000). In many households, pepper provides the only needed flavor to enhance the intake of otherwise bland diets. The range of food products that contain pepper or its chemical constituent is broad, and it includes ethnic foods, meat, salad dressings, mayonnaise, dairy products, and candies, packed foods, snack foods, salsa, and hot sauces. Consumption of pepper accounts for about 20% of the average vegetable consumption per person per day in Nigeria (Alegbejo, 2002). People consume pepper for intake enhancement as well as to supplement dietary household needs. It is used extensively in food flavouring in the daily diet of over 120 million Nigerians, irrespective of their socio-economic status. It is used in the preparation of soups and stew, which are among the major essential compliments of staple based on cereals and root crops and also forms remedies for toothache and sore throat.

Pepper has achieved major economic significance in the global market due to increased World-wide interest and demand. Pepper has the ability to play a role in rural income generation, poverty alleviation, and food and nutrition security among producers (Adewoyin et al., 2011). Pepper grown in Nigeria is in high demand, because of its pungency and good flavor. Investing in pepper production is one of the ways of curbing unemployment, income generation and sourcing for foreign exchange in recent years (Adaigho and Tibi, 2018). Although, production and sale of pepper fruit generates income to farmers; there is a need to improve farm-level productivity and yield of producers (Oredipe, 2012). Pepper is widely cultivated throughout Nigeria, yields obtained by peasant farmers are often very low Adigun (2001). Nigeria still imports pepper, thus indicating that there is high demand for pepper locally and that local production is unable to meet the higher demand for pepper in Nigeria. This high demand in pepper may be seen from the perspective of the various roles and importance pepper serves in the economy. Following this development, Ajibefun and Daramola (2003) argued that Pepper production in Nigeria has once been reported to be a lucrative business; a testament to its potential. Despite the good weather, soil and numerous potential of pepper in Nigeria, pepper yield in Nigeria have been very low compared to Western Europe. The low yield in pepper production in Nigeria could be attributed to some production challenges which include disease, pest and poor management practices (Jaliya and Sani, 2006). Furthermore, poor agricultural production as well as marketing system, disease and unstable price of pepper discourage farmers from producing more. Production constraints such as low soil fertility, weeds, lack of right combination of enterprises and diseases are the major problems (Ogunbo, 2015; Chukuigwe et al. 2021). These and many other problems seem to bedevil pepper production which perhaps account for the shortfall in output and mismatch in supply and demand equilibrium. The study is geared at ascertaining the profitability of pepper production as an incentive to boost output by encouraging influx of prospective pepper farmers and as well identify peculiar problems to pepper production in the study area which may hamper farmer's efforts in pepper cultivation.

## Objective of the Study

The specific objectives of the study were to;

- i. describe the socio-economic characteristics of pepper farmers in the study area;
- ii. describe pepper production practices in the study area;
- iii. ascertain the profitability of pepper production in the study area, and;
- iv. identify the constraints to pepper production in the study area;

## MATERIALS AND METHODS

The study was conducted in Ogba/ Egbema/Ndoni Local Government Area (ONELGA) in Rivers State with its headquarters in Omoku. It is one of the major oil producing Local Government in the Niger Delta. According to the 2006 census held, ONELGA had a population of 283,294 people. It has a population density of 371 persons per sq/km and with 8,547 households spreading over an area of 13,8040km<sup>2</sup> according to the Local Government records Iyorakpo (2015).

According to Utuechi Farmers' Cooperative, there are 300 pepper farmers in the LGA with all coming from the Ndoni district of the LGA which serves as the hub for pepper farming. From the later population, *Taro Yamene* (1967) *Formula* was employed to determine a sample size of 171 pepper farmers. Furthermore, Multi stage sampling techniques was employed in the sampling: Firstly, the study purposively selected four (4) communities from the Ndoni District namely, Utuechi, Anieze, Agwe, and Ogboegene. This was owing to their predominance in pepper cultivation. Secondly, simple random sampling technique was employed in selecting 43 farmers from Utuechi, Anieze, Agwe, and Ogboegene each. Meanwhile, out of the 172 questionnaires issued, only 160 were retrieved.

The Taro Yamene formula (1967) is given as:

$$n = \frac{N}{1+N(e)^2} \quad \text{Eqn. (1)}$$

Where:

n= sample size

N= Population

e = level of precision or confidence level (0.05)

$$n = \frac{300}{1+300(0.05)^2}$$

$$n = \frac{105}{1+105(0.0025)}$$

$$n = \frac{105}{1.75}$$

n = 171

Primary data were collected viz., structured questionnaires, personal visits, contacts and interviews. Subsequently, these data were subjected to descriptive and inferential analysis. Objective i and ii were described with the utilization of frequency count and percentages. Objective iii was actualized using farm budgeting techniques to determine the profitability of pepper production in the study area and objective iv was actualised using mean score analysis.

### Farm Budgeting Model

$$\text{NFI} = \text{GFI} - \text{TVC} - \text{TFC} \quad \text{Eqn. (2)}$$

Where; NFI = Net Farm Income (₦)

GFI = Gross Farm Income (₦)

TVC = Total Variable Cost (₦)

TFC = Total Fixed Cost (₦)

Where; G.M. I = gross margin income, T.R = total returns, T.V.C = total variable costs

### Mean Analysis Using Likert-Scale

Four-point Likert scale rating technique was used particularly in identifying problems associated with plantain production. The rating is presented in the following order:

Strongly agreed (SA) = 4,

Agreed (A) = 3,

Disagree (D) = 2,

Strongly disagree (SD) = 1.

The mean scores of the respondents based on the 4-point scale will be  $4 + 3 + 2 + 1 = 10$ ,  $10/4 = 2.5$ .

**Benchmark:** The benchmark using the four- point Likert Scale to analyze the constraints militating against pepper production was 2.5. The 2.5 constraint benchmark indicated the constraints that militated against farmer's production, mean values from 2.5 and above shows that the parameter is a constraint in pepper production.

## RESULTS AND DICUSSION

### Socio-Economic Characteristics of Pepper Farmers

The socio-economic characteristics of plantain marketers in the study area are presented in Table 1.

**Table 1: Socio-Economic Characteristics of Respondents (n = 160)**

Characteristics	Frequency	Percentage	Mean
<b>GENDER</b>			
Male	49	30.6	
Female	111	69.4	
<b>Total</b>	<b>160</b>	<b>100.0</b>	
<b>AGE (Years)</b>			
18-30	38	23.8	

31-43	92	57.5	36.4 years
>43	30	18.8	
<b>Total</b>	<b>160</b>	<b>100.0</b>	
<b>MARITAL STATUS</b>			
Single	31	19.4	
Married	81	50.6	
Separated	36	22.5	
Widowed	12	7.5	
<b>Total</b>	<b>160</b>	<b>100.0</b>	
<b>HOUSEHOLD SIZE (Person)</b>			
2-4	50	31.3	
5-7 plots	98	61.3	5 persons
>7	12	7.5	
<b>Total</b>	<b>160</b>	<b>100</b>	
<b>FARMING EXPERIENCE (Years)</b>			
1-3	14	8.8	
4-6	24	15.0	4.8 years
7-9	55	41.9	
>9	67	34.4	
<b>Total</b>	<b>160</b>	<b>100</b>	
<b>EDUCATIONAL ATTAINMENT</b>			
No formal education	25	15.6	
Primary	37	23.3	
Secondary	79	49.4	
Tertiary	19	11.9	
<b>Total</b>	<b>160</b>	<b>100</b>	
<b>Monthly Income (₦)</b>			
10000-40000	31	19.4	
41000-80000	25	15.6	
81000-120000	74	46.3	₦87121.88
>120000	30	18.8	
<b>Total</b>	<b>160</b>	<b>100</b>	
<b>Member of Cooperative</b>			
Yes	67	41.9	
No	93	58.1	
<b>Total</b>	<b>160</b>	<b>100</b>	

**Source: Field Survey, 2022**

Table 1 shows that pepper farming in the study area was dominated by females at 69.4% while their male counterpart had 30.6%. This result is dissimilar to the findings of Ayodele et al., (2016); Sanusi and Ayinde (2013). The unmatched participation of women in pepper farming indicates that women are economically active and tend to play a role in supporting the economic wellbeing of their families through pepper production. Entries on age show that the study area was comprised more of farmers within the age range of 31 – 43 years at 57.5%. This age range falls within active economic age group and the result agrees with the findings of

Sanusi and Ayinde (2013) who examined the profitability of pepper production in Ogun State, Nigeria. Subsequently, farmers within the age range of 18-30 years and greater than 43 years had 23.8% and 18.8% respectively and Furthermore, the Table also shows that pepper production is dominated by married farmers in the study area at 50.6%. The marital status of the marketers has a massive effect because it is a radical factor in their socio-economic obligation to their family (Bobola *et al.*, 2019).

Information on household size show that farmers who had household sizes of greater than 7 persons where least with 7.5% score just above it were those with household size of 2 – 4 persons with 31.3% score. This would imply that the study area is mainly composed of farmers who have 5 – 7 persons as this enjoyed 61.3% share on household. This result agrees with the findings of Adaigho and Tibi (2018) whose study was on the assessment of pepper production and socio economics of pepper farmers in Delta State, Nigeria. Large household sizes can serve as a source of labour that may eventually lower the economic cost of farming for the rural dwellers.

Entries on farming experience show that majority (41.9%) of the farmers had farming experience greater than 9 years followed by 34.4% with farming experience 7 – 9 years. The Table shows that the least farming experience accounted for was 1-3 years and this recorded 8.8%. According to Olaoye *et al.* (2013), the number of years of experience could improve skills and better approaches to farming practices. Experience can help correct past errors and expand or contract the scales of the application of tested skills. From Table 4.1, farmers without formal education were least in the study area at 15.6%. Among the ranks of those who were educated, farmers who attended only primary school and secondary school had 23.1% and 49.4% respectively. Meanwhile those who enjoyed tertiary education were at 11.9%. Alabi *et al.* (2010), reported that education acquired is an important factor influencing management and the adoption of new technology.

Findings on monthly income showed that 19.4% of the farmers had monthly of ₦10000 - ₦40000, 15.6% had ₦41000 - ₦80000 and 18.8% had monthly income greater than ₦120000. However, 46.3% majority of the farmers had had ₦81000 - ₦120000 monthly income. Furthermore, the information on membership of cooperative society showed that 41.9% of the farmers belonged to cooperative societies while 58.1% of not did not. The effect of this result is that most of the chilli pepper farmers in the study area do not enjoy the assumed benefits accrued to co-operative societies through pooling of resources together for a better expansion, efficiency and effective management of resources and for profit maximization Bala (2015).

### Pepper Production Practices

Information containing frequencies and percentages regarding the pepper production practices are presenting in Table 2.

**Table 2: Farming Operations on Pepper Farming**

Characteristics	Frequency	Percentage	Mean
<b>Use of Agrochemical</b>			
Yes	160	100.0	
No	0	0.0	
<b>Total</b>	<b>160</b>	<b>100.0</b>	

<b>Use of Fertilizer</b>			
Yes	0	0.0	
No	160	100.0	
<b>Total</b>	<b>160</b>	<b>100.0</b>	
<b>Total land Area for Pepper Farming</b>			
1-3 plots	36	22.5	
4-6 plots	87	54.4	5.0 plots
> 6 plots	37	23.1	
<b>Total</b>	<b>160</b>	<b>100.0</b>	
<b>Number of Seeds/Hole</b>			
1 seed/hole	148	92.5	
2 two seeds/hole	12	7.5	
<b>Total</b>	<b>160</b>	<b>100.0</b>	
<b>Number of Labour (Per man-day)</b>			
1-2	37	23.1	
3-4	100	62.5	3 persons
5-6	23	14.4	
<b>Total</b>	<b>160</b>	<b>100.0</b>	
<b>Source of land</b>			
Personal	24	15	
Hired	94	58.8	
Family	42	26.3	
<b>Total</b>	<b>160</b>	<b>100.0</b>	

Source: Field Survey, 2022

Information on the use of agrochemical in Table 2 demonstrates that 100% of the farmers employed agrochemicals for pest control in the study area. Conversely, they all did employ the application of fertilizer in their farming operations. The absence of fertilizer application could be attributed to the Niger river enriching the fertility of their lands which are flooded occasionally yearly as they are located along the river bank. Entries on total land area for pepper farming from the Table indicate that 22.5% farmed pepper on 1-3 plots of land, 23.1% farmed the crop on land size greater than 6 plots while a majority of 54.4% did their farming on land size ranging from 4 – 6 plots. Still on Table 4.2, information on the number of seeds planted per hole showed that 92.5% planted 1 seed per hole and 7.5% of the respondents claimed they planted 2 seeds per hole. On labour, Table 4.2 showed that 23.1% employed 1-2 persons for their farming operation, 62.5% employed 3-4 people and 14.4% employed 5-6 person for their farming activities. Finally on table 2, entries on source of land showed that only 15% claimed that their source of land was personal, 26.3% indicated it was family sourced, and 58.8% of the farmers in the study area hired their lands for pepper cultivation.

#### **Average Annual Costs and Returns on Pepper Production**

Information on the estimation of the profitability of pepper farming using farm budgeting model is represented in Table 3.

**Table 3: Average Annual Costs and Returns on Pepper Production Per 0.12 Hectares**

<b>Item</b>	<b>Amount (₦)</b>
<b>Gross Farm Income</b>	<b>1808250</b>
Seed	36187.5
Transportation	9581.25
Agrochemicals	8815.625
Labour	353081.3
<b>Total Variable Cost (TVC)</b>	<b>407665.6</b>
<b>Gross Margin (GM)</b>	<b>1400584</b>
Depreciation	3990.625
Rent on Land	43375
<b>Total Fixed Cost (TFC)</b>	<b>47365.63</b>
<b>Total Cost (TC)</b>	<b>455031.3</b>
<b>Net Farm Income (Profit)</b>	<b>1353219</b>
<b>Net return on Investment (NROI)</b>	<b>3.97</b>

**Source: Field Survey, 2022**

Table 3 shows the average gross farm income realized per annum which stood at ₦180,8250 and the total variable cost was at ₦407,665.6 and thus, this gave a gross margin of ₦1,400,584. Gross margin is used as a budgeting tool for measuring efficiency and profitability among different enterprises. The value of the total fixed cost components was at ₦47,365.63. While, the average annual net farm income (profit) stood at ₦59,234.52 for 0.12 hectares. This result agrees with the works of Alabi et al., (2022); Adaigho and Tibi (2018); Ayodele et al., (2016); and Mohammed et al., (2017) who concluded that pepper farming was profitable. Analysis on net return on investment showed that for every ₦1.00 invested into pepper production in the study area, ₦3.97 return was realized.

### **Constraints to Pepper Production**

The problems faced by pepper farmers in the study area were analyzed using mean score and the result is presented in Table 4.



**Table 4: Constraints to Pepper Production**

Constrains	SA (4)	A (3)	SD (2)	D (1)	Total Score	Freq.	Mean ( $\bar{x}$ )
Price instability	412	147	16	0	575	160	3.59375
Pest and diseases	364	105	68	0	537	160	3.35625
Lack of irrigation facility	204	246	44	5	499	160	3.11875
Difficulty in accessing credit	164	198	74	16	452	160	2.825
Poor storage facility	0	0	44	138	182	160	1.1375
Insecurity	0	42	62	115	219	160	1.36875
Flooding	612	15	0	0	627	160	3.91875

$\bar{x} \geq 2.50$  = important;  $\bar{x} < 2.50$  = unimportant

**Where: SA = Strongly Agree A = Agree, D = Disagree, SD =Strongly Disagree**

**Source: Field Survey, 2022**

Table 4 highlights the constraints to pepper farming in the study area and the different mean scores associated with them. Within the benchmark of 2.5 mean score, it is evident that Poor storage facility ( $\bar{x} = 1.1375$ ) and Insecurity ( $\bar{x} = 1.36875$ ) were unimportant constraints because they fall below the threshold of 2.5 mean score. However, constraints such as Price instability ( $\bar{x} = 3.59375$ ), Pest and diseases ( $\bar{x} = 3.35625$ ), Lack of irrigation facility ( $\bar{x} = 3.11875$ ) and Difficulty in accessing credit ( $\bar{x} = 2.825$ ) were important as they rose above the benchmark of 2.5 means score. As can be seen from the Table, the chief constraint was flooding ( $\bar{x} = 3.91875$ ) as it ranked highest amongst all. Some of the farming communities in the study area sit along the bank of River Niger and their pepper cultivation is carried out just along the bank of the famous River. This result disagrees with the finding of Adaigho and Tibi (2018); Ayodele et al, (2016) who respectively ranked difficulty of accessing credit lack of capital as the major constraint faced by pepper farmers in their studies. This disparity can may be associated with the peculiarity in the terrain in which pepper is cultivated in the study area.

## CONCLUSION AND RECOMENDATIONS

### Conclusion

From the results generated, the study concludes that pepper production in the study area is profitable and that the cultivation of this crop is predominantly carried out by females. In addition, the most dominant problem faced by the pepper farmers in the study area was flooding.

## Recommendations

On the premise of the findings, the study made the following recommendations:

- i. Owing to its profitability, government should encourage unemployed youths to go into pepper production so that the gap between demand and supply can be narrowed.
- ii. Drainage facilities should be constructed within farming communities which are prone to incidences of flooding.

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