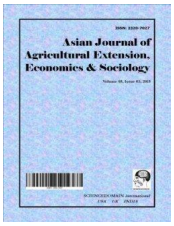

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Economics of Plantain Production in Calabar Agricultural Zone, Cross River State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This project work dealt with the Economics of Plantain Production in Calabar Agricultural zone, Cross River State. The specific objectives of the research were to examine the socio economic characteristics of plantain farmers, identify the different farming practices in the area, analyze cost and returns relationship of plantain farming, and problems militating against plantain production in the zone. A multistage random sampling technique and purposive sampling technique were used to administer structured questionnaire to 90 respondents. Data collected were analyzed using frequency, percentage and mean, while budgetary analysis was used to determine the profitability of plantain farming. The results showed that majority (94.4%) of the respondents were male with the age bracket of 51-60 years with mean of 56 years. The finding also shows that 44.44% of the respondents have 6-10 years of farming experience with a mean of 9 years. The result further shows that many of the respondents do not have good qualification, rather majority have primary education representing 61.11%. Most of the farmers' savings were personal savings as only source of capital. Most of the farmers have <360 plantain produce annually. The results of the budgetary analysis showed that the calculated gross margin is N191,400 and benefit cost ratio of 1.7, so plantain production is profitable. The result also shows that net profit is estimated at N123,415 and a

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gross ratio of 0.7. The major problems confronting the farmers in the zone is land tenure, lack of inputs and poor storage facilities. To improve p-lantain production in the study area, it is recommended that government should establish various research centres, provision of farm inputs, provision of low or no interest rates loans for the procurement of required inputs.

Keywords: Plantain; production; distribution and adaptation; agricultural zone.

1. INTRODUCTION

Plantain (*Musa* Spp), are important food crops in Sub-Sahara Africa, providing more than 25% of the carbohydrate and 10% of the calorie for approximately 70 million people in the region [1]. Plantain is cultivated along the coast of west and central Africa stretching from Guinea to the Democratic republic of Congo and central Africa republic [2]. Plantain production is mainly in the Southern states of Nigeria which include; Akwa-Ibom, Cross River, Imo, Enugu, Rivers, Edo, Delta, Lagos, Ogun, and Oyo [3].

The major producing countries with an annual output exceeding a million tones include; Nigeria Ghana, Cote d'voire and Cameroon. Food and Agricultural organization, [4] indicates that Nigeria is one of the major producers of plantain in West and Central Africa, but the per capita consumption for Nigeria is the lowest in the region, implying the existence of market potential for increased production in the country [5]. FAO [4] observed that Africa contributes about 50% of world production of plantain. The gross value of production of this crop ranks first among food crops in Sub-Sahara Africa. The demand for plantain is increasing in West and Central Africa [6]. It has a very high nutritional value and source of dietary carbohydrates, vitamins and minerals. Plantain and Banana are extremely rich in vitamin A. Today, plantain is grown in 52 countries with world production of 33 million metric tons [7]. Production of plantain in Nigeria between 1990 and 2004 indicates a down ward trend in terms of yield per hectare while price per ton have steadily increased within the period [5,8]. However, only eight African countries were named among the top ten world producers of plantain with Nigeria ranking 5th highest producers of the crop [9]. However, its cultivation is threatened by black Sigatoka. This disease was accidentally introduced into Africa and first observed in Zambia in 1973 [10]. According to Adeniji et al. [11], plantain industry in Nigeria is complex as farmers whose land lies nearer to major roads harvest the crop at the mature fresh stage and display it at the road side or transport in tons to market where wholesalers and retailers purchase directly. They further stated that in other cases, marketers go to farms where they collect and hand over to wholesalers and retailers or vendors for sale. Total world production of these crops is estimated to be over 76,000,000 metric tons, out of which an estimated 12,000,000 metric tons are produced in Africa annually. Most of these are consumed or traded locally [12]. Also from 2007-2012 there is a downward indication trend [13]. Despite the importance of plantain in world, Nigeria and Calabar agricultural zone in particular little is known about its value; Plantain serves as the major food for diabetic patients which is on the increase till date [14]. There has been inadequate information on the improved cultivars of plantain due to lack of extension services which has reduced its production [15]. According to Shodehinde & Oboh [16], plantainis consumed in variety of forms in the world both in boiled and roasted forms

2. METHODOLOGY

The research was conducted in Calabar Agricultural zone of Cross River State, Nigeria. It is made up of 6 Local Government Areas which include: Bailsa, Akamkpla, Odukpam, Calabar South, Calabar municipal and Akpabuyo. Calabar agricultural zone has a population of 371,022 as at 2006 census. It is one of the three (3) agricultural zones of cross River state. Calabar agricultural zone features a tropical monsoon climate with lengthy wet season spanning ten months and a short dry season covering the remaining two months. The harmattan noticeably less pronounced in the city. Calabar agricultural zone covers an area of 406 sqkm with a density of about 910km^2 (2400sq m).Temperature is relatively constant in the area ranging from 25 to 28 degree celcius. The soil is fertile, well drained and aerated and favours plantain production.

3. SAMPLING TECHNIQUE

In carrying out this study, purposive and simple random sampling technique was used for data collection. In Calabar agricultural zone, we have

six Local Government Areas (LGAs), out of which 3 LGAs were purposively selected, this was because the 3 LGAs are fully engaged in plantain production more than others which enhanced information collection from the farmers In the 3 LGAs, 2 communities each were selected making a total of 6 communities, this helped in visiting other Local Government Areas easily. Finally, 15 respondents were randomly selected from each of the 6 communities which gave a total of 90 respondents.

Both primary and secondary data were used for the study. For the primary data, questionnaire was administered to selected farmers. Some alternative questions were provided from which respondents were expected to tick the item that fit the response. Secondary data were obtained from books, newspapers, seminar papers, bank journals and government publication.

Gross margin analysis is expressed below;

$$GM = TR - TVC \quad (1)$$

$$\text{Gross margin/unit output} = \frac{\text{Gross margin}}{\text{Total output}} \quad (2)$$

$$\text{Profit} = \text{gross margin} - \text{total fixed cost} \quad (3)$$

4. RESULTS AND DISCUSSION

Table 1. Average fixed cost of plantain in the zone (n =90)

Items	Quantity	Lifespan (yrs)	Unit cost (₦)	Depreciation	Amount (₦)
Spade	5	4	1,700	425	2, 125
Cutlass	5	3	1,500	500	2,500
Wheel barrow	2	7	8,500	1,214	2,428
Land rent	2 hectare		60,000	60,000	60,000
Hoe	4	3	700	233	932
Total fixed cost					**67,985**

Source: Field survey, 2017

Table 2. Average variable input of the plantain in the zone (n=90)

Inputs	Quantity	Unit cost (₦)	Amount (₦)
Labourmandays	4 men	10,000	40,000
Fertilizer	3 bags	6,000	18,000
Sucker	270	150	40,500
Transportation	-	6,000	6,000
Pesticide	3 litres	1,700	5,100
Total Variable Cost (TVC)			**109,600**

Source: Field Survey, 2017

Total cost (TC) **=** Total fixed cost (TFC) + Total variable cost (TVC)
TC = TFC + TVC
TC = 57,985 + 109,600
TC = 177, 585

Table 3. Farm returns on plantain

Items	No. of fruit and suckers	Unit cost (₦)	Total cost (₦)
Suckers	130	100	13,000
Fruits	360	800	288,000
Total Revenue			**301,000**

Source: Field survey, 2017

Gross margin **=** TR – TVC
TR = Total revenue
TVC = Total variable cost
G.M = 301,000 – 109,600
G.M **=₦** 191,400

Net farm profit = Total Revenue – Total cost
NFP = ₦ 301,000 – ₦ 177, 585
NFP = ₦ 123, 415

BENEFIT COST RATIO

BCR $\frac{\text{Total Revenue}}{\text{Total cost}}$

BCR= $\frac{₦301,000}{₦177,585}$

BCR = 1.7

An investment is profitable if the BCR is greater than 1

Rate of Return (ROR) = $\frac{\text{Net profit}}{\text{Total cost}}$

ROR = $\frac{₦123,415}{₦177,585}$

Total revenue

$\frac{₦ 17,585}{₦ 301,000}$
=0.59

From the above calculations, it is shown that plantain production is a profitable business. A farmer makes a profit of ₦ 123, 415 annually after the maturation of fruits and suckers. The budgetary analysis shows that the benefit cost ratio is 1.7 meaning that for every ₦1 invested in the enterprise, it will yield ₦ 1.7. The gross ratio (0.57) shows that for every ₦1 returns to the enterprise, 57k is being spent. Since the gross margin is positive, it shows that plantain farming is a very profitable business in calabar agricultural zone.

Table 4. Cost and returns (N=90)

Item	Quantity	Unit cost(₦)	Amount (₦)
Labour mandays	4 men	10,000	40,000
Fertilizer	3 bags	6,000	18,000
Sucker	270	150	40,500
Transportation		6,000	6,000
Pesticide	3 cans	1,700	5,100
Total variable cost (TVC)			109,600

Table 5. Depreciation

Item	Quantity	Life span (yrs)	Unit cost (₦)	Depreciation	Amount (₦)
Spade	5	4	1,700	425	2,125
Cutlass	5	3	1,500	500	2,500
Wheel barrow	2		8,500	1,214	2,428
Land rent	2 Ha	3	60,000	60,000	60,000
Hoe	4		700	233	932
Total (Fc)					₦ 67,985

Table 6. Revenue

Items	No. of fruits and suckers	Unit cost (₦)	Total cost (₦)
Suckers	130	100	13,000
Fruits	360	800	288,000
Total Revenue			301,000
Gross margin (TR-TVC)			191,400
Total cost (Tc) = TVC+ TFC			177,585
Net profit (NP) = TR – TC			123,415
Benefit cost ratio = TR/TC			1.7
Rate of return = NP/TC			0.7
Gross ratio = TC/TR			0.59

The inference above has shown that plantain production is profitable in Calabar agricultural zone of Cross River State, Nigeria.

5. CONCLUSION

The study recorded that inadequate input, low level of education, fragmented or small land holdings, high cost of labour and low extension services were the serious problems facing plantain production in the agricultural zone. The study also shows that plantain enterprise is a means of livelihood among middle age rural and urban dwellers who although have other means of livelihood to argument household income and for sustenance. In spite of all the problems confronting the farmers and this shows that the future prospects for plantain production is very bright. To ensure sustained and improved plantain production, the following recommendations were therefore made; provision of inputs, incentives and subsidies, formation of cooperatives, increased extension services, making land available and provision of improved varieties

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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