

**Full Length Research Paper****Problems and Prospects of Large Scale Plantain Banana (Musa Spp) Production in Abia State, Nigeria****Nwaiwu I.U<sup>1</sup>; Eze, C.C<sup>1</sup>; Amaechi, E.C.C<sup>2</sup>; and Osuagwu, C.O<sup>2</sup>***1. Department of Agricultural Economics, Federal University of Technology Owerri, P.M.B. 1526, Owerri Imo State, Nigeria.**2. Department of Agricultural Management and Extension, Imo State Polytechnic, Umuagwo.**\*Correspondence: e-mail- niuche2004@yahoo.com***ABSTRACT**

The obvious high demand for plantain banana without a corresponding supply epitomized by the persistent high prices prompted this study. The study was conducted in Abia State, Southeast Nigeria. Multi-stage random sampling technique was employed in the selection of 100 respondents used for the study. Data were analysed using descriptive statistical tools and Return on Investment analytical approaches to identify the problems and prospects in P/B production respectively. The results showed that the major problems militating against P/B production in the study area were the frequent and long period of drought, myriads of marketing challenges, lack of storage facilities, incidence of pests and disease infestation, and the menace of wind storm. It also showed that P/B production is a farm business of very high prospect with a return on investment of ₦1.12k. It was therefore concluded that P/B production is a viable farm business enterprise to engage-in irrespective of the myriads of associated problems militating against its production. Government and indeed all stake holders in agriculture should facilitate measures geared towards more effective and efficient ways of mitigating the outlined problems and thereby making the business more attractive and profitable.

**Key words:** Investment, Plantain, Banana, multi-stage, drought, disease, wind storm.

**INTRODUCTION**

Until recently the bulk of fruits consumed by Nigerians came from the wild, homestead gardens and traditional cropping systems. In the traditional cropping systems, fruit trees like citrus, mango, guava, pawpaw, plantain/banana and pineapple are encountered as intercrops in the plantation of cocoa and kola, mostly in the south (Adelaja and Olaniyan, 2000). They are also encountered as boundary plants, shade trees in villages and sidewalks 'volunteers' along village and township roads (Onochie, 1975). Others are found in front of residential buildings and behind the yards as hedge rows or ornamentals. In southeast Nigeria, plantain bananas are unconsciously produced in home gardens and rarely found in farm lands closer to the farmers' homestead. With the increasing awareness of the health, nutritional and industrial potential of the crop plantain banana, attention is now going into ways and means of increasing the output through large scale production rather than the hitherto backyard garden approach.

Plantain and banana belong to the family Musaceae. Plantain is generally taller and bears fewer, larger and looser fruits than banana. There are several varieties of plantain varying in size shape, and number of fruits to a bunch (Irvine, 1969). Plantain and banana are very important food crops in the humid forest and mid-latitude zone of Sub-Saharan Africa providing more than 25% (percent) of the carbohydrate and 10% (percent) of the calorie intake for approximately 70 million people in the region (Irvine, 1969). Plantain is a large herb with pseudo - stems built up from the sheath and it originated from Asia. It is grown both in the tropics and sub tropics with Central America and West Indies producing most of the crop (Yayock et al 1988). Musa spp, a plant genus of extraordinary significance to

human societies; produces the fourth most important food in the world today (after rice, wheat and maize) (Abbott, 1992). The following varieties of plantain and banana are available in Nigeria: Plantain; (Local) Obino 1 'Ewai, Orishele, Isiokpo, Agbagba, Hybrids Cardaba, Bluggie. Banana: (Local) Paranta, Omini (Exotic): Dwarf Cavendish Caros Michel (Adelaja and Olaniyan, 2000).

In Ghana Plantain banana is produced in the forest regions and transported to urban centres such as Accra on the coast. Although South East Asia is considered to be the centre of origin of Musa species, a remarkable diversity of plantain exist in Sub-Saharan Africa, each of these types is grown in a distinct sub region (Ortiz et al 1996). In Nigeria today, the commercially important plantain varieties include the French and horn types. In general the choice of varieties to grow depends on the availability of planting materials, market preference and ecological factors (Yayock et al 1998). In Abia State climatic and soil condition are quite conducive for good growth and development of all known tropical crops. Annual productions of plantain and banana are about 20,000 metric tones with an average of 14 to 15 tones per hectare in the state, (IITA 1996). Plantain best thrive in Umuhia, Aba, and Ohafia Local Government areas of the state where farm land are left to fallow for over 3years (IITA 1996). Plantain thrives in a well-drained, fertile, sandy-loam soil of up to pH 4.5 and annual rainfall of at least 1200mm distributed over at least six months (Adelaja and Olaniyan, 2000).

The economic importance of plantain banana makes the crop an invaluable tree crop in a country like Nigeria where health, nutrition and dietary implications of foods are of top priority in most intellectual discourse. In addition to being a

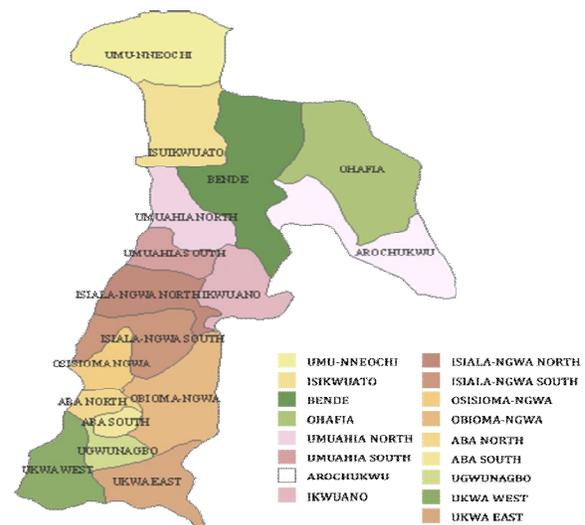
staple food for rural and urban dwellers, it is a source of income particularly for smallholder farmers who produce them in compounds or income gardens. Plantains are relatively high value products, in common with most other horticultural crops. The gross value of their annual production in Sub-Saharan Africa exceeds that of several other food crops such as maize, rice, cassava, and sweet potatoes (IITA, 1996). Plantain and bananas based foods contain most of the micronutrients required by both children and adult for optimum growth and development of the body. The daily dietary allocations recommended by FAO for children under five years are 14mg of Iron, 10mg of Zinc, and 400µg of vitamin A (Latham, 2001). According to Honfo, et al(2007), the daily consumption of plantain foods by children provided approximately 0.88mg of iron, 0.26mg of zinc, and 24.55 µg Retinol Activity Equivalent (RAE). Besides, for non-pregnant and non-lactating women, FAO recommends a daily intake of 48mg of iron, 12mg of zinc and 800 µg RAE of vitamin A (Latham, 2001). Following these also, Honfo et al (2007) found that the daily consumption of plantain derived foods for mothers provided approximately 1.80mg of iron, 0.6mg of zinc and 43.35 µg RAE of vitamin A.

Availability of plantains and bananas can be affected by the problems encountered during their production. In Nigeria according to (Hahn, 1991), most plantains and bananas are produced in the kitchen garden, on areas ranging from 0.5 to 1.8ha. This leads to demand which far out weighs supply in the country. This is because farmers still adhere to the traditional practice of producing their crops at their dockyard or where it incidentally grows and they do not have access to improved cultivars of plantain and bananas. Other problems which militate against the production and marketing of plantains and bananas include, lack of adequate information due to lack of extension services (IITA, 1996). Another problem is inefficient marketing system as put by Akinwolemiwa, (1975); the sellers of fresh produce are a host of disorganized small enterprise exploiting the situation. Little thought is given to grading, packaging and presentation. There is no organized marketing system for sale of plantain and banana products. This arises from lack of information between buyers and sellers to facilitate movement of the product from place to place. There is also a lack of grading and standard weight measurement resulting in erratic price setting and movement especially as plantain and banana are delivered to the consumers from the villages by middle men (Ngeze, 1994). Some other problems encountered in the marketing of plantain include inadequate road transportation network especially leading from rural to urban areas, thus causes post harvest losses which arises due to delays during transportation. Also harvesting the fruit at a wrong time may lead to poor quality product being brought to the plantain or banana industry. Akalumbe et al, (1990) concludes that post harvest losses were found to constitute a constraint to the marketing system, particularly at the retails level of the system. Finally, inadequate research is another major problem militating against plantain and banana production. According to Ngeze, (1994) research in various aspects of banana and plantain husbandry has for a long time not been

given the priority and importance it deserves, when compared to other main crops, especially those known as cash crops. There is also low or absence of government funding for research. Furthermore, in the course of literature search for this study, it was found that available report on the economic prospects from plantain banana enterprise that is specific to the farmer as an entrepreneur is scanty. This also constitutes a problem to production/availability of plantain banana because of lack of knowledge of the profits or otherwise from the business enterprise. In light of the foregoing, this paper is designed to bring to the fore those pertinent problems and also the prospects accruing from plantain banana production as a viable farm business enterprise that can be grown on a commercial scale.

## MATERIALS AND METHODS

The study was conducted in Abia State, Southeast Nigeria. Geographically Abia State lies within approximately latitudes 40° 50' and 60° North and longitude 70° 10' and 80° East (ACCIMA, 1998). Abia State has a population of 2,833,999 people and a total area of 6320km<sup>2</sup> (NPC, 2006). The state shares common boundaries to the north with Ebonyi State, to the south and southwest with Rivers State, and to the east and southeast with Cross River and Akwa Ibom States respectively. To the west is Imo State and to the northwest is Anambara State. Abia State is made up of 17 Local Government Areas (LGAs) and 3 Agricultural zones. The zones are Ohafia, Umuahia, and Aba with 5, 5 and 7 LGAs respectively.



Map of Abia State, Nigeria

Multi-stage random sampling technique was employed in the selection of respondents used for the study. Firstly one agricultural zone was purposively selected based on the greatest proportion of plantain banana producers available according to the records of extension department of Abia State, Agricultural Development Programme (ADP). The second stage involved the selection of 2 LGAs from the zone. The third stage involved selection of 5 communities from each of the LGAs to get a total of 10 communities. Fourthly, 2 villages were selected from each community to

get 20 villages. Finally, 5 plantain banana producer households were randomly selected from each village which yielded a sample size of 100 respondents. Data were collected from primary sources using structured and validated questionnaire. These include information on the farmers' socio-economic characteristics, various problems encountered by the farmers including the incidence and prevalence of pest and diseases. Marketing challenges etc. Others are information on their input-output relationships with respect to quantities and prices involved.

Data were analysed using descriptive statistics like mean, frequency distribution and percentages. Further analyses were done to determine the prospects from plantain banana production using the Accounting Rate of Return method or Return on Investment (ROI). The ROI uses accounting information as revealed by the financial statements to measure the profitability of an investment (Pandey, 2008). This otherwise measure the returns per naira invested. For an investment with ROI greater than 1, it indicates a potentially profitable venture and if less than 1, it shows a potentially unprofitable venture. The ROI is given as thus;

$$ROI = \frac{\text{Average Income}}{\text{Average Investment}}$$

$$= \frac{TR - TC}{TC} = \frac{NFI}{TC} \quad \text{Adopted from (Pandey, 2008)}$$

Where  
 TR = Total Revenue  
 TC = Total Cost  
 NFI = Net Farm Income

**RESULTS AND DISCUSSION**

Table 1 shows the socio-economic characteristics of Plantain banana farmers in the study area

**Table 1:** Socio-economic characteristics of Plantain banana producers in Abia State

Characteristics	Frequency	Percentage
<b>Age range (mean = 46years)</b>		
21-30	5	5
31-40	10	10
41-50	60	60
51-60	25	25
<b>Educational Level –Years (Mean= 7)</b>		
No formal education	0	34
Primary education	1-6	22
Secondary education	7-12	9
Tertiary education	12- 17	35
<b>Farm Size -Hectare (Mean =1.42)</b>		
0.001-0.99	29	29
1.00- 1.99	55	55
2.00- 2.99	11	11
3.00- 3.99	5	5
<b>Household Size -Number of persons (Mean= 6)</b>		
1-5	54	54

6-10	32	32
11-15	14	14
<b>Farming experience –Years (Mean= 7)</b>		
1-5	35	35
6-10	48	48
11-15	17	17
<b>Marital Status</b>		
Married	69	69
Single	31	31
<b>Extension Services</b>		
Access	53	53
No access	47	47

Source: Field survey Data, 2011

Table 1 shows that the mean age, level of education, farm size, household size and farming experience are 46 years, 7 years, 1.42 hectares, 6 persons and 7 years respectively. These imply that most farmers who are involved in plantain banana production are within the working class age limit and therefore in the position to effectively and efficiently utilize the available resources towards production of P/B and also put in to practice improved techniques of production. The mean level of education entails that the farmers in the study area have not acquired reasonable period of formal education which may have affected their level of knowledge and adoption of improved technology. This could equally influence negatively their ability to avert some of the problems that militate against plantain banana production hence low productivity. The farm size of 1.42 hectares shows that the farmers in the study area are predominantly smallholder farmers who farm with rudimentary capital and therefore limited in scope of operation and production. The household size implies that the farmers are conscious of birth control measures and the likely pros and cons of large family sizes. Plantain banana farmers in the study area have acquired enough experience on the farm as to be in the position to know measures to take to ensure increases in gross margin, hence profit from the plantain banana enterprise. This length of experience would have enabled them to know most of the challenges usually faced in plantain banana production. Furthermore, the table showed that 69 and 53 percent of the farmers are married and have had contact with extension agents respectively. These show that most of the farmers are responsible and settled families who are reliable and committed to the business of P/B production. Besides, they have had reasonable contacts with extension agents who would have impacted on them the available innovations of P/B production. This is expected to have a positive effect on plantain banana production.

**Problems of Large Scale Plantain Banana Production in Abia State**

Table 2 shows the distribution of respondents according to problems encountered in large scale plantain / banana production

**Table 2** Frequency Distribution of Respondents according Problems Encountered in P/B Production.

Problem Encountered <sup>m</sup>	Frequency <sup>m</sup>	Percentage
Disease infestation	75	75
Marketing problems	95	95
Land acquisition problem	45	45
Drought	100	100
Heavy wind damage	65	65
Lack of storage facilities	80	80

<sup>m</sup>Multiple response recorded, so frequency and percentages not additive.

Source: Field data survey, 2011

Table 2 indicates that 100 percent of the farmers have the problem of drought in plantain banana production. This implies that excessive dry season which is being aggravated by the menace of climate change is a serious draw-back to effective and efficient P/B production in the study area and indeed Nigeria. This could be related to the fact that P/B needs enough water to enable the pseudo stem remain turgid (ie lodging tolerant) so that they will resist heavy winds that usually fell them down. Wind problem which leads to felling of the plants before maturity period was reported to be suffered by 65 percent of the farmers. This problem is usually aggravated by excessive drought as has earlier been noted. Next to drought is marketing problem which is suffered by 95 percent of the farmers. It is obvious that most times as a result of poor road network, lack of vehicles, and the activities of middlemen, rural farmers receive little or nothing as marketing margin from their produce. This goes a long way in discouraging large scale production. According to the result, 80 percent of the farmers suffer the problem of lack of storage facilities. Owing to the short shelf life for P/B fruit upon full maturity, the need for storage facilities become very pertinent. Therefore it constitutes a serious limiting factor in the study area since a very significant percentage of the farmers are reported to suffer that problem. Land acquisition although reported by 45 percent to be a problem does not signify a serious limiting factor to P/B production. Table 1 showed that the mean farm size by the farmers is 1.42 hectares. This size is on the low side but clearly epitomizes the typical smallholder farmers in Sub-Saharan Africa who farm on marginal lands.

Disease infestation is another serious constraint to large scale P/B production not only in the study area but also to farmers all over the world. The result shows that 75 percent of the farmers reported that disease infestation is one of their greatest challenges. Diseases and pest are increasingly becoming limiting factors in smallholder and export production and can cause catastrophic losses (Jones, 2000a). Diseases are the reason breeding programs were established in Trinidad, Jamaica, Honduras and Nigeria, and have been cited as a primary reason for the creation of International Network for the Improvement of Banana and Plantain (INIBAP) (Buddenhagen, 1993). Diseases affect all portions of the plant and are caused by fungi, bacteria and viruses, and have been the subjects of entire books (Jones 2000a; Stover 1972; Wardlaw 1961). The major fungal disease is the black sigatoka otherwise known as black leaf streak

disease caused by *Mycosphaerella fijiensis*. This results in moderate to severe damage wherever significant rainfall occurs (Jacome et al, 2003). The most significant bacterial disease are the vascular wilts (Thwaites et al, 2000). There are four significant diseases of banana that are caused by viruses (Jones, 2000; Ploetz et al. 2003a). Bunchy top is the most damaging and total losses can occur if early diagnosis and strict sanitation is not practiced. It is most likely caused by Banana bunchy top virus (BBTV)(Ploetz, 2004).

**Prospects from Large Scale Plantain Banana Production in Abia State**

In order to identify the likely prospects from plantain banana production, the Return on Investment approach was employed to estimate that applicable to producers in the study area.

**Table 3 shows the Cost – Return Statement of Plantain banana Producers in Abia State.**

**Table 3:** Cost>Returns Statement of Plantain banana farmers in Abia State.

Item Percentage	Value-₦ /ha/annum	
<b>Returns</b>		
Income from Plantain	195,205.51	69.55
Income from Banana	85,458.15	30.45
<b>TOTAL REVENUE (TR)</b>	<b>280,663.6</b>	<b>100.00</b>
<b>Variable Cost</b>		
Transport /marketing cost	1,648.24	1.35
Fertilizer cost	10,387.31	8.48
Cost of planting materials	96,197.18	78.50
Labour cost	14,309.86	11.68
<b>Total Variable Cost (TVC)</b>	<b>122,542.59</b>	<b>100.00</b>
<b>Fixed Cost</b>		
Cost of management	8,450.70	
Depreciation value of equipment	478.87	
Stall Rent	845.07	
<b>Total fixed cost (TFC)</b>	<b>9,774.64</b>	
<b>TOTAL COST (TC)</b>	<b>132,317.23</b>	
<b>Gross Margin (TR-TVC)</b>	<b>158,121.07</b>	
<b>NET FARM INCOME(NFI) TR-TC</b>	<b>148,346.43</b>	

Source: Field data survey, 2011

Therefore, the Return on Investment (ROI) =  $\frac{TR - TC}{TC}$

$$= \frac{280663.66 - 132317.23}{132317.23} = 1.12$$

This result implies that for every one naira (₦1) invested in plantain banana production, the sum of one naira twelve kobo (₦1.12k) was got as profit. This result clearly indicates that plantain banana production is a potentially viable farm business enterprise that has great prospects.

## CONCLUSION

Large scale Plantain and Banana (P/B) Production is a sure means of bridging the wide demand-supply gap usually associated with the products. From this study, it can be concluded that the major problems militating against P/B production in the study area are the frequent and long period of drought, myriads of marketing problems, lack of storage facilities, incidence of pests and disease infestation, and the menace of wind storm. Despite these challenges faced by P/B farmers in the study area, the business has very high prospect with a net farm income per hectare of ₦148,346.43 and return on investment (return per naira invested) of ₦1.12k. This shows that P/B is a profitable business when effectively managed irrespective of the associated challenges.

## RECOMMENDATION

The following recommendations are therefore proffered to help ameliorate the problems encountered by the farmers and hence make P/B production a more profitable venture.

- Irrigation facilities should be made available to farmers to cushion the effect of drought.
- Infrastructural facilities like access roads, electricity, railways, etc should be provided by all stakeholders to alleviate some marketing and storage challenges.
- Further researches into more appropriate technologies of combating the problems of pest and diseases in P/B production should be encouraged by government and donor research agencies. This should also be made available and affordable to the smallholder farmers.
- Farmers should be encouraged to plant protective trees round the P/B fields as hedge rows to act as wind breaks that will reduce the rate of lodging/felling of P/B trees as a result of wind storm. Also propping in P/B fields should be encouraged especially for those plants that are bearing fruits.

Finally, land use acts should be amended to favour land use for agricultural purposes which will make more land available and affordable for P/B production in the study area.

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