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Involvement of Farm Households in Banana and Plantain Production in Aguata Agricultural Zone of Anambra State, Nigeria.

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Abstract

The study examined backyard banana and plantain production among households in Aguata Agricultural Zone. Sixty randomly selected heads of households were used for the study. Data were generated using structured interview schedule and analysed by means of descriptive statistics Majority (63.3%) of the respondents had 1-50 stands of banana and plantain on their farm under mixed cropping pattern (68.3%). About 53.4% of the households were engaged in banana and plantain production mainly for consumption and they sourced planting materials from personal farms, All members of the household were involved in the production process, though the adult female dominated the execution of most farming tasks. The major agronomic practices employed by the households in banana and plantain production were de-suckering/pruning (96.7%), de-budding (91.7%), application of organic/inorganic manure (90.0%), de-leafing/de-trashing (76.7%), mulching (65.0%) and weeding (61.7%). Major factors militating against backyard banana and plantain production were susceptibility to wind, storm and drought (M= 2.25), poor yield (M=2.08), cluster nature of growth (M=1.91), high incidence of pest and diseases (M=1.88), long maturation period, high temperature/low rainfall (M=1.66) and unstable market price (M=1.65).Therefore extension agents from public and non- governmental organisations should The study thus, recommended that extension agents from public and non- governmental organisations should build knowledge and skills of farm households on critical agronomic practices, pest and disease management necessary to boost production and increase return to households. This can be achieved through workshop; radio programmes, and community awareness campaign. Research institutions should intensify efforts towards generation of drought and disease resistance and high yielding varieties for enhanced production.

Key Words : Plantain, banana, household, agronomic.

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Introduction

Over the years, banana (*Musa sapientum L*) and plantain (*Musa paradisiaca L*.) have occupied strategic positions in agricultural production across the Continent. They represent the world's second largest fruit crop with an annual production of 129,906,098 metric tons (FAOSTAT, 2010). Banana and plantain rank as the fourth most important global food commodity after rice, wheat and maize in terms of gross value of production (Shaibu, Maji and Ogburia, 2012). Specifically, banana is the world's second most important fruit crop after oil palm. It is grown in 130 countries worldwide and its world production stands at 71 million metric tons, while plantain is grown in 52 countries with world production of 33 million metric tons (FAO, 2004). However no African country is ranked among the top 10 countries for banana production in the world. On the contrary eight African countries are among the top world producers of plantain with Nigeria ranking as the fifth highest producer of the crop (FAO, 2004).

Plantain and banana are among the most important staple food crops in the humid forest zone of West and Central Africa (Nkendah and Akyeampong, 2003; and Faturoti, Madukwe, Tenkouano and Agwu, 2007; Afro news, 2003). In Africa, estimated 70 million people in the region depend on these crops for more than 25% of their carbohydrate and 10% of calorie intake (Ogungbe, 2005). They contribute to food security, employment and diversification of income in rural and urban areas. According to CTA (2005) they are important source of revenue for many small scale farmers and thus play an important role in poverty alleviation.

Banana and plantain production across the globe has been on the decline. For instance, the trend of plantain production in Nigeria between 1990 and 2009 showed that yield per hectare consistently made a down ward move from 7.54 tons per hectare in 1992 to 4.94 tons per hectare in 1999; then 5.10 tons in 2000 to 4.90 tons in 2001 and 6.31 tons in 2007 to 5.90 tons in 2008. Conversely, an unsustainable increase in the area cultivated / harvested steadily rose from 162,000 hectares in 1990 to 481,000 hectares in 2009 (FAO, 2011). Consequently, though Nigeria is one of the major producers of banana and plantain in West and Central Africa, the per capita consumption is the lowest in the region. This suggests gap in demand and supply, which is often reflect in incessant price rises in rural and urban areas. Invariably, this means a significant market potential for increased production in the country.

Continued production of bananas and plantain, however, is threatened by several pests and diseases, such as banana nematodes weevils, black leaf streak/black sigatoka and others. , Eden-Green,. Biruma, Pillay, Tripathi, Blomme, (2007) reported that black Sigatoka is already causing yield losses of 30 to 50 percent in banana and plantain production in south-eastern Nigeria. According to the authors the shortages are also noted in the Great Lakes region, which accounts for more than half of Africa's banana production. Kenya has noted a rapid decline in banana production over the last 20 years, mostly due to pests and diseases. In Uganda, production has nearly halved, and the trends are similar in Tanzania, Rwanda and Burundi; countries where the banana is a major source of calorie.

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Furthermore, research has shown that vast majority of producers world-wide and Nigeria in particular are small scale farmers growing the crops either for home consumption or for local markets (Faturoti, Madukwe, Tenkouano and Agwu (2007). According to Tijani et al., (2009) more than 80% of the production comes from smallholder farmers of less than one ha. In Nigeria, Anambra State is one of the highest banana and plantain producing state (Ekunwe and Ajayi, 2010). More recently, notable interest in production of the crops among farm households has continued to increase in the state. Almost every household explores available marginal lands for production of banana and plantain. However, there has not being distinctive reduction in supply and demand gap or sustained increase in per capita consumption of households. The pertinent questions however are: What are the banana and plantain production characteristics of farm households?. What are the level of household involvement in banana and plantain production?. What are constraints affecting households' banana and plantain production. What are the extension needs on banana and plantain production among households? Therefore the study was design to assess the farm households' involvement in banana and plantain production. Specifically, it sought to:

1. ascertain banana and plantain production characteristics of farm households;
2. determine household roles in banana and plantain production
3. ascertain constraints to production of banana and plantain among farm households;
4. identify extension needs of farm households for banana and plantain production;

Methodology

The study was conducted in Aguata Agricultural Zone of Anambra State, Nigeria. The zone lies between latitudes 6º 13' and 7º 9' N of equator and longitudes 7º 49' and 7º 57'E of Greenwich meridian. Aguata Agricultural Zone covers the area of about 5,025 sq. km (NPC, 2006) with an estimated population of about 370,172 persons.. The population of the study comprised farm households. Multi-stage random sampling technique was used for selection of respondents. First, three out of the six blocks (Aguata I, Aguata II, Orumba I, Orumba II, Orumba III and Nnewi) that made up Aguata Agricultural Zones were randomly selected using simple random sampling technique. The selected blocks were Aguata II, Orumba I and Nnewi. In the second stage, one circle in each block was selected by simple random sampling technique giving a total of 3 circles. Twenty household were purposively selected from each circle based on existence of banana and plantain in the homestead. Heads of households were used for the study. A total of 60 heads of households were used.

Data were collected by use of structured interview schedule. The instrument was divided into four sections based on the objectives. Objective one elicited information on banana and plantain production characteristics. Respondents were requested to provide information on the production system, farm size, location, agronomic practices, sources of planting materials and annual income. Objective two measured the role of members of household in banana and plantain production. Respondents were asked to indicate the role played by each member of the family in the production of the crops (like; land acquisition, procuring materials, sucker selection and de-

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suckering, planting/propagation, fertilizer/manure application, harvesting). Objective three addressed constraints to households in the production of banana and plantain. The respondents indicated among list of items (susceptibility to wind/storm/drought, ligh incidence of pest and diseases infestation, long maturity period etc) the extent each constrains production of banana and plantain. A three point Likert-type scale of very great extent, great extent, little extent and no extent with weighted values of 3, 2, 1 and 0 was used, respectively. The sum of the values was divided by 4 (6/4) to obtain 1.5. Factors with mean score greater or equal to 1.5 were regarded as major constraints, while less than 1.5 were regarded as minor constraints to banana and plantain production.

Objective four identified the extension needs of the respondents. Respondents were requested to indicate on a three point Likert-type scale of "very important (2), important (1) and not important (0)" the areas they need extension intervention for banana and plantain production (example farming system most appropriate, pests and disease management, Soil fertility management/conservation, accessing good price, cheap transportation, processing technology, credits, formation of cooperative). These values were added to obtain 3, which was further divided by 3 to obtain a mean value of 1. Items with mean score equal or greater than 1 were regarded as the major extension need of the respondents, while items with mean scores less than one were considered as minor extension need of the respondents. Data were presented in frequency, percentage and analysed using mean and standard deviation.

Results and Discussion

Production characteristics of banana and plantain among farm households

Table 1 shows that majority (70.0%) of the respondents planted banana and plantain at the backyard, while 26.75% and 3.3% planted in the field and along the road, respectively. The results agree with Bayeri et al. (2004) who reported that backyard/compound system of banana and plantain production is more predominant in south eastern part of Nigeria. . The respondents (63.3%) had 1-50 stands of banana and plantain in their farms and a lesser proportion (1.7%) had 151-200 and 200 & above, respectively. This may be because greater proportion (53.4%) of households engaged in banana and plantain production basically for consumption, while generation of income (46.7%) informed production interest of lesser number.

Greater proportion (56.7%) of the households sourced planting materials from personal farms and about 43% sourced from friends and neighbours, research institution, private farms and ADP/LGA. This shows low genetic diversity in banana and plantain production, which has been attributed as one of the causes of increase disease and pest infestation on plantain and banana. Highlighting on its consequences, Scientists warn that production is already being reduced and may very well cease entirely within ten years, (Afro news, 2003), because existing banana plants are reproduced from cuttings and there is little genetic diversity. According to Temple, Kwa and Fogain (2006) this may be as a result of lack of adequate information from extension, research and private sectors. Also problems of accessibility, transportation and technical know-how could constrain access to improved planting materials. .Households cultivated banana and plantain with

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arable crops (73.3%), tree crops (10.0) and horticultural plants/vegetables (1.7%). Only 15% had banana and plantain plantation. Intercropping of bananas with other crops is a common soil fertility improvement strategy particularly when planted with legumes and deep rooted plants. Moreover, it is a preferred production method in West Africa due to the potential for improved profit margins from the cultivation of multiple crops (Fonsah and Chidebelu, 2011).

The respondents (68.3%) earned between 1000 and 20,000 annually and only 1.7% earned 100,000 and above. Generally, the findings suggest that plantain and banana production among farm households are on small scale basis and mainly targeted family consumption. This corroborates with Faturoti, Madukwe, Tenkouano and Agwu (2007) that vast majority of producers world-wide and Nigeria in particular are small scale farmers growing the crops either for home consumption or for local markets. According to Tijani et al., (2009) more than 80% of production comes from smallholder farmers of less than 1ha. However, it supports the fact that plantain and banana are among the most important Staple food crops (Nkendah and Akyeampong, 2003) and are important source of revenue for many small scale farmers (CTA, 2005).

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Table1: Percentage distribution of respondents based on production characteristics

Characteristics	Percentage(n=60)
Location	
Field	26.7
At the backyard	70.0
Along road side	3.
Source of planting material	
Proceedings from previous year/own farm	58.3
Neighbours	35.0
Private	3.3
Research	1.7
ADPs/MOA	1.7
Reason for production	
Consumption	54.3
Income	45.7
Number of banana and plantain in the farm	
1-50	63.3
51-100	26.7
101-150	6.6
151-200	1.7
201 and above	1.7
Production system	
Horticulture/vegetables	1.7
Arable crop	73.3
Tree crop	10.0
Plantation	15.0
Income/ year (₦)	
1000-20,000	68.3
20,001-40,000	15.0
40,001 – 6,0000	8.3
60,001- 80,000	5.0
80,001-100,000	1.7
100001 and above	1.7

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Management practices employed in banana and plantain production

The most common management practices employed in banana and plantain production were de-suckering/pruning (96.7%), de-budding/replanting (91.7%), application of organic/inorganic manure (90.0%), de-leafing/de-trashing (76.7%), mulching (65.0%) and weeding (61.7%) (Table 2) Also 63% each control pest and diseases, and propping, respectively, while 43.3% practiced spacing. The result indicates that majority of the respondents employed a significant number of the management practices. This may be due to the smallness of the farms and their location since most of the banana and plantain are planted in the compound. A considerable percentage of the respondents however, did not employ some agronomic practices like spacing, weeding, propping, pest and disease control. It is possible that the respondents lack knowledge of the importance and the requisite skills/resources for the application. Regular and strict application of agronomic practices is highly important for increase and sustained production. Forinstance, desuckering and spacing ensure that good plant population is maintained and could result to healthy plants. Also replanting of suckers after a series of fruiting cycles is important, as disease often builds up over a period of years and greatly diminishes the amount of fruit produced by the plant. (Helstop-Harrison 2007).

Table2: Management practices employed in banana and plantain production

Management practices	Percentage (n=60)
Occasional weeding	61.7
Application of organic/inorganic manure	90.0
De-suckering/pruning	96.7
de-budding/replanting	91.7
Mulching	65.0
Plant spacing	43.3
De-leafing/de-trashing	76.7
Pest/disease control	63.3
Propping	63.3

Roles of households' members in banana and plantain production

Data in Table 3 show that land acquisition/choice for banana and plantain production was the sole responsibility of adult men (100%). This may be because of traditional land ownership pattern in Igbo land which gives only male folk rightful ownership to land. A lesser proportion were involved in land clearing (30.0%), procuring materials for planting (35.0%), puddling of the soil for planting.(38.3%), sucker selection and de-suckering/pruning (35.0%). The adult females were involved in de-budding/de-belling (61.7%), de-leafing/de-trashing (56.7%), weeding (53.3%), fertilizer/manure application (48.3%) and harvesting (46.7%). A lesser proportion (16.7%) of youth/children was involved in weeding and 15.0% was involved in sucker selection and de-suckering/pruning and fertilizer/manure application, respectively, Generally, all members

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of the household are involved in banana and plantain production.. Invariably, members of household perform one function or the other in banana and plantain production. However, women dominate most production/management roles. This is contrary to the finding of Adesope, Usman, Abiola, and Akinyemi (2004) and Bayeri and Ajayi, (2000) who reported that production of banana and plantain is male dominated, while women essentially handle processing and marketing. The results are in line with study of International Network for the Improvement of Banana and Plantain (1989), which reported that, the majority of banana and plantain farmers in East and central Africa are women. Also, according to Karamura,Mgenzi, Karamura and Sharrock (2004), certain activities like desuckering, and detrashing of banana and plantain is a traditional practice and is commonly done by women. Youths are less active in production of banana and plantain and this confirms the lack of interest in agriculture observed among the youths.

Table 3: Percentage distributions respondents according to roles perform by household members.

Activities	Adult male (%)	Adult female (%)	Youth/children (%)	All (%)
Land acquisition	100	-	-	-
Land clearing	30.0	36.7	13.3	20.0
Procuring material	35.0	38.3	10.0	16.7
Puddling of the soil	38.3	31.7	13.3	16.7
Sucker selection de-suckering/pruning	35.0	33.3	15.0	16.7
Planting/propagation	33.3	36.7	13.3	16.7
De-budding/d-belling	6.7	61.7	11.7	20.0
Weeding	5.0	53.3	16.7	25.0
Fertilizer/manure application	13.3	48.3	15.0	23.4
De-leafing/de-trashing	10.0	56.7	10.0	23.3
Harvesting	16.7	46.7	10.0	26.7
Processing	8.3	10.0	10.0	21.7

Constraints to banana and plantain production

The major constraints to banana and plantain production were high susceptibility to wind, storm and drought (M=2.25), poor yield/theft (M=2.08), cluster nature of growth (M=1.91), high incidence of pest and disease (M=1.88). Others include lack/poor access to credit (M=1.83), long maturation period (M=1.71), irregular rainfall (M=1.66), unstable market price/ poor return from output (M=1.65) and poor soil fertility (M=1.63) (Table 4) The respondents perceived that the minor constraints to banana and plantain were poor technical knowledge, (M=1.43), poor access

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to fertilizer/organic manure (M=1.36), lack or poor market information (M=1.30) and others. The findings corroborate with Fonsah and Chidebelu, (2011) who reported that wind damage is a major problem for banana producers worldwide. According to the author wind speeds above 40km/hr can completely destroy a banana plantation. This is often due to poor rooting system and tender nature of banana and plantain stems which make them susceptible to wind, storm and drought. Similarly poor yield and theft equally constitute major constraint especially when the soil is not fertile and the stands located at unsafe places.

High incidence of pest and disease can be severe when most agronomic practices are ignored which is often evidence where farmers do not depend on the production as an importantr income sources. Above all, this problem could be exacerbated by incidence of climate change and the associated problems and impacts on rain-fed agriculture. High incidence of pest and disease could result to poor yield, low quality/ market value and poor return to households. Scholars reported that Black Sigatoka is already causing yield losses of 30 to 50 percent in banana and plantain production in south-eastern Nigeria (Eden-Green, Biruma, , Pillay, Tripathi, Blomme, 2007). Other countries like Kenya, Uganda, and Tanzania have noted a rapid decline in banana production over years, mostly due to pests and diseases.

Furthermore, the results agree with Stover (2000) who reiterated that in absence of diseases, soil fertility is the major factor causing reduced banana yields. Also in a study by Barekye et al., (2000) in Masaka district, farmers ranked soil fertility as the third most important constraint to banana production after insect pests and weeds. This is possible because bananas and plantain take a considerable amount of nutrients, especially potassium which must be replaced if continuous production has to be maintained. Though, household wastes are distributed near the homestead resulting in a soil fertility gradient that could lead to higher yields but the challenge of soil fertility increases as the distance from the homestead increases particularly in acid soil.

Constraints such as cluster nature and poor yield of banana and plantain are inter-related and associated with poor application of agronomic practices among households. According to Akinyemi, Aiyelaagbe, & Akyeampong (2010) inadequate knowledge of improved cultural practices around plantain/banana production, coupled with inefficient government extension services and the limited scope of plantain research are believed partially to be responsible for continued low yields in Nigeria. Also the indication of lack of credit and poor market price of products suggest low social capital, perhaps due to consumption-oriented production goal and small farm size of households. It is also an indication that most farm households are not members of cooperative/farm organizations and consequently, may not have direct access to credit facilities and good price for products, which would presumably limit farmers' ability to access production inputs and reduce potential yields..

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Table 4: Mean score of producers according to constraints to banana/plantain production

Constraints	Mean	Standard. Deviation
Poor soil fertility	**1.63**	0.82
Lack of tech. knowledge of Improved agronomic practices	1.43	1.14
High cost of input	1.10	1.02
Lack or high cost of improved varieties	1.21	1.05
Long maturity period	**1.71**	0.99
Cluster nature of the growth	**1.91**	1.01
Lack or poor market information	1.30	1.09
High cost or unavailability of labour	1.25	1.05
Laborious nature of banana an and plantain production	1.21	0.86
Poor access to extension services	1.48	0.92
Lack or poor access to credit	**1.83**	1.07
Susceptibility to wind, storm and drought	**2.25**	0.72
High incidence of pest and diseases	**1.88**	0.84
Poor interest on banana and plantain	1.10	1.02
Climate change(high temperature and shortage of rainfall)	**1.66**	0.96
Unsuitable market price or poor return from output	**1.65**	1.02
Lack of preservation and processing technique	1.23	0.98
Unavailability or poor access to improved varieties	1.26	0.95
Lack of access to farm implement	1.08	1.02
Lack of equipment and fertilizer or organic manure	1.36	1.05
Poor yield/theft	**2.08**	2.66

Extension needs of households on banana and plantain production

Entries on Table 4 show that six (37.5%) out of sixteen possible extension needs were perceived important to farm households. These included pest and disease management (M=1.63), access to improved planting material (M=1.55), spacing (M=1.31), weed control (M=1.22), fertilizer application (M=1.13) and propping (M=1.03). The remaining ten (62.5%) items were perceived less important to the households for improved production of banana and plantain. Extension needs of households are basically on knowledge of good agronomic management/cultural practices. Practically, pest and diseases is one of the major challenges threatening banana and plantain farmers and it could cause reduction in yield, income and quality of produce. Hence, knowledge of effective control and management of the same may improve production and market value of produce. Similarly, access to improved planting materials that are resistant to pest and diseases is crucial to improve the quantity/quality of yield and income of households. Furthermore, knowledge of spacing distance is important due to the cluster nature of banana and plantain growth; and the need for training on fertilizer application might be due to continuous cultivation of the same plot of land without adequate nutrient replacement practices. Traditionally, homestead banana and plantain production depends solely on organic materials from

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kitchen waste, compost of harvested plants or animal waste; while fertilizer is mostly common in plantation farms.

Table 5 Mean scores on extension needs of households for banana and plantain production

Extension need	Mean	Std. Deviation
Improved planting material	**1.55**	0.81
Production resources eg access to credit	0.56	0.83
Appropriate farming system	0.96	0.97
Marketing information	0.36	0.66
Pests and diseases management.	**1.63**	0.73
Processing and storage	0.93	0.75
Weed control	**1.22**	1.45
De-suckering	0.85	0.77
Propping	**1.03**	0.82
De-leafing	0.71	0.73
Spacing	**1.31**	0.74
De-budding	0.55	0.69
Mulching	0.40	0.66
Fertilizer application	**1.13**	0.76
Compost manure application	0.85	0.75

Conclusion

Banana and plantain production among farm households is in small scale, intercropped with arable and tree crops and mainly for family consumption. It is a household farm enterprise because members of the households played key roles in production activities but women dominated in the performance of most functions. Farm households employed some agronomic practices in production of banana and plantain. However, production is constrained by issues related to pest /diseases, climate, productivity and soil fertility. The study thus, recommended that extension agents from public and non- governmental organisations should build requisite knowledge and

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skills of farm households on critical agronomic practices, pest and disease management necessary to boost production and increase return to households. This can be achieved through workshop; radio programmes, and community awareness campaign. Research institutions should intensify efforts towards generation of drought disease resistance and high yielding varieties for enhanced production.

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