VARIETAL PREFERENCE FOR BANANA AND PLANTAIN IN ILESHA METROPOLIS, OSUN STATE, NIGERIA

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ABSTRACT

Adoption rates of introduced banana/plantain cultivars are often low compared to their economic importance. This study investigated banana/plantain varietal preference among farmers in Ilesha, Osun State, Nigeria. A total of 150 banana/plantain farmers were sampled using snowballing technique to select 150 respondents. Data collected were analysed with both descriptive and inferential statistics. The mean age of the farmers was 41.8. Findings showed that majority of the respondents cultivated Alabameji (82.7%), Agbagba ohun (82.7%) and PITA 17 (63.3%). PITA 17 ($\bar{x}$=2.09) ranked first as improved variety cultivated while Ijeshaloba and Asogba ($\bar{x}$=2.39) ranked first as local varieties cultivated. The aggregated score showed that local varieties ($\bar{x}$=2.22) were most preferred by farmers. Findings on farmers' preference criteria showed that high market value ($\bar{x}$=3.75) ranked first, bunch length ($\bar{x}$=3.74) ranked second and results on constraints facing the banana/plantain plantation of preferred varieties indicated that incidence of pest and diseases ($\bar{x}$=3.74) ranked first. Hypothesis testing showed that education (β=-0.199, $p<0.05$); age (β=-2.436, $p<0.05$), education (β= 0.143, $p<0.05$), and farm-size (β= 0.236, $p<0.01$) influenced their preferences for local and improved banana/plantain varieties respectively. The study concluded the farmers in the study area had higher preference for local varieties of banana/plantain due to high market value and bunch length. Varieties mainly preferred were Ijeshaloba, Asogba, Agbagba ohun and PITA 17. Thus, agricultural research institutions concerned with genetic breeding should focus on developing varieties with higher attributes for bunch length, and number of fingers per bunch to boost farmers' prospect for high market value for banana/plantain produce.

Keywords: Bunch, Cultivation, Improved varieties, Local varieties, Preferred

INTRODUCTION

The family Musaceae includes plantains and bananas. Plantains are often taller and produce fewer, larger, and looser fruits than bananas. Plantains are available in a variety of sizes, shapes, and numbers of fruits per bunch. Plantains and bananas are essential food crops in Sub-Saharan Africa's humid forest and mid-latitude zone, accounting for more than 25% of carbohydrate and 10% of calorie consumption for around 70 million people (Olumba and Onunka, 2020; Mignouna *et al.,* 2020).

The economic value of plantains and bananas makes the crops highly valuable tree crops in a country like Nigeria, where health, nutrition, and dietary implications of foods are top priorities in most debates. In addition to being a staple food for rural and urban residents, it is a source of revenue for smallholder farmers who grow it in compounds or income gardens (Mogaji and Mogaji, 2020). Plantains, like most horticulture crops, are relatively valuable products. Their yearly output value in Sub-Saharan Africa exceeds that of several other food crops, including maize, rice, cassava, and sweet potatoes (Kindt *et al*., 2023).

Like other bananas, plantain production is still dominated by farmers preferred local varieties, principally owing to their consumer-preferred attributes (taste, texture, colour and aroma) (Marimo *et al.,* 2020). Food uses of plantain in Nigeria include dodo (fried ripe pulp), boli (roasted unripe–ripe pulp), fufu (boiled and pounded unripe pulp), amala (unripe pulp milled into flour and reconstituted into a thick dough), moin-moin (unripe–ripe pulp milled and steamed), porridge/pottage (unripe pulp boiled with additional ingredients), chips (fried unripe pulp) and dodo Ikire (fried overripe pulp with additional ingredients) (Owolade *et al.*, 2022).

Understanding farmers' preferences for banana and plantain cultivars and their features is crucial for developing cultivars that suit consumer needs in the numerous ways for which they are used in Nigeria, as well as for effective farmer adoption (Madalla, 2021). Even though most of the hybrid banana/plantain cultivars have good yields and are resistant to numerous major pests and pathogens harming the area's banana/plantain industry, farmers' adoption is still determined by a combination of several key characteristics (Sanya *et al.*, 2020).

Adoption rates of introduced banana and plantain cultivars are frequently low compared to their economic importance and are lower than for other staple crops (Marimo *et al.*, 2020; Walker and Alwang, 2015). Furthermore, research is scarce on the adoption rates of new banana/plantain cultivars in SSA. The adoption of local cultivars has failed to match the increasing demand for the commodity, resulting in a decline in banana/plantain production in Nigeria in the last two decades (Ebewore, 2016).

The general objective of the study was to examine the farmers' varietal preference for plantain and banana in Ilesha, Osun State, Nigeria and the specific objectives were to;

i. describe the socio-economic characteristics of banana and plantain farmers;

ii. identify the banana and plantain varieties grown by the farmers;
iii. assess the preferred banana and plantain varieties by the farmers;
iv. assess the preference criteria for banana/plantain varieties by the farmers; and
v. determine the constraints facing the plantation of preferred banana/plantain varieties

METHODOLOGY

The study was conducted in Ilesha, Osun State. Osun State is in South-Western Nigeria and lies within latitudes 6º and 9º N of the equator and approximately between longitudes 2º and 7º E of the Greenwich meridian (Fadipe and Oladepo, 2020). It is one of the landlocked states of the Federal Republic of Nigeria. It covers an estimated 8,062 square kilometres. Ilesha has an agrarian economy, with a vast majority of the populace involved in farming and it is a typical rainforest with mean annual rainfall varying between 880 mm and 2600 mm and is characterised by forest vegetation.

There was no existing registered list of banana and plantain farmers in Ilesha metropolis. Therefore, this study used snowball sampling to generate and compile the list of banana and plantain farmers in Ilesha metropolis, where about 192 farmers were generated. From this list, Taro Yamane sample determination formula was used as expressed mathematically thus:

$$n = \frac{N}{1+N(e)^2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ equation 1}$$

Where:
n= sample size
N = target population = 520
e = 0.05

$$n = \frac{240}{1 + 240(0.05)^2}$$

n = 150 respondents

Therefore, a simple random selection of 150 farmers was generated from the list generated.

RESULTS AND DISCUSSION

Socioeconomic characteristics

The results in Table 1 indicated that the majority (67.3%) of the respondents were male, with a small percentage (32.7%) being female. This suggests that males dominated banana and plantain-related activities in the study area. This finding supports the results of Joel *et al.* (2022), who claimed that banana/plantain farming in Nigeria is dominated by males, which could be related to the difficult activities involved in banana/plantain production. Furthermore, Table 1 showed that the respondents' average age was 41.8 years, indicating that the banana and plantain farmers were still relatively young and that they were expected to work on plantations with agility and activity in order to increase production.

Further results showed that some (47.3%) were married while only 13.3% were divorced. This implies that a larger percentage of the respondents were married, and this conforms to the findings of Morgan and Kainga (2024), in which 60.0% of the plantain farmers in their study area were married. Men and women need family income to support their families. Thus, an increase in family income will lead to an increase in output and, in turn, improve their standard of living.

Findings in Table 1 showed that some respondents (39.3%) had primary education and a small percentage (14.0%) had no formal education. Based on the findings, it is possible to conclude that banana/plantain farmers in the study area had a moderate level of education. This suggests that some banana/plantain farmers will value the use of improved technologies for banana/plantain production. Furthermore, nearly half (48.0%) of respondents had 6–10 people living in their households, while 13.3% had 11 or more, with an average household size of 6 people. The result shows the availability of family labor for banana/plantain agricultural activities in the study area.

The majority (79.2%) of farmers worked full-time, while others (23.3%) worked part-time in banana/plantain production. This implies that just a few banana/plantain farmers in the study area had alternative livelihoods. This occupation could contribute to these farmers' commitment to banana/plantain production (Olumba and Onunka, 2020). Furthermore, the majority (76.0%) of respondents inherited land for banana/plantain farming, with only a small percentage (5.3%) renting. According to Nkwain *et al.* (2022), farmers who purchased and rented land increased production costs, resulting in higher prices and lower profits from banana/plantain production.

Table 1 showed that 40.0% of respondents cultivated 1-10 acres of banana/plantains, with only 2.7% cultivating 31 acres or more. This implies that the banana and plantain farmers in the study area were smallholders. The results are consistent with the findings of Kainga *et al.* (2019), who discovered that 80.0% of plantain farmers in Bayelsa State had farms of less than 2.5-5 acres. Results in Table 1 also showed that the average years of banana/plantain farming experience were 12.7 years, with half (50.0%) of respondents having 1-10 years of experience and only a few (1.3%) having 31 or more years of experience. This suggests that the farmers in the study area had many years of expertise producing bananas and plantains. This experience may enhance their understanding of improved banana/plantain varieties available in the study area. This also shows that banana/plantain farmers with many years of farming experience are familiar with the limitations, which increases their adoption of innovations as a means of alleviating productivity constraints (Kainga *et al*., 2019).

Table 1: Distribution of respondents by their socio-economic characteristics

Variables	Frequency	Percentage	Mean (SD)
Sex			
Male	101	67.3	
Female	49	32.7	
Age (years)			41.8(16.19)
≤ 30	40	26.7	
31 – 40	46	30.7	
41 – 50	34	22.7	
51 and above	30	20.0	
Marital status			
Single	38	25.3	
Married	71	47.3	
Divorced	20	13.3	
Widowed	21	14.0	
Level of education			
None	21	14.0	
Primary	59	39.3	
Secondary	20	13.3	
Tertiary	50	33.3	
Household size (persons)			6.0(2.77)
1 – 5	58	38.7	
6 – 10	72	48.0	
11 and above	20	13.3	
Farming status			
full time farming	115	76.7	
part-time farming	35	23.3	
Mode of farm land ownership			
Inheritance	114	76.0	
Purchase	27	18.0	
Rent	8	5.3	
Gift	1	0.7	
Banana/plantain farm size (Acres)			15.1(8.15)
1 – 10	60	40.0	
11 – 20	53	35.3	
21 – 30	33	22.0	
31 and above	4	2.7	
Years of Banana/plantain farming experience			12.7(8.00)
1 – 10	75	50.0	
11 – 20	46	30.7	
21 – 30	27	18.0	
31 and above	2	1.3	

Source: Field Survey, 2024

4.2 Banana and plantain varieties grown by farmers

Table 2 showed that most respondents cultivated Agbagba ohun (82.7%), Alabameji (82.7%), Ifenla (79.3%), and Agbagba erin. Only a few farmers cultivated BITA 3 (32.0%) and Cardaba (24.0%). The limited plantation of improved varieties, frequently associated with inferior fruit quality attributes, shows the importance of incorporating consumption qualities early in the breeding process (Marimo *et al.*, 2020; Tenkouano *et al.*, 2019).

Table 2: Distribution of respondents by types of banana/plantain varieties cultivated

Banana/plantain varieties	Frequency	Percentage
Improved varieties		
BITA 3	48	32.0
PITA 17	95	63.3
FHIA 21	84	56.0
Cardaba	36	24.0
Local varieties		
Ijeshaloba	110	73.3
Ifenla	119	79.3
Agbagba ohun (False horn type)	124	82.7
Agbagba erin (Elephant type)	119	79.3
Koloko (alabameta)	111	74.0
Asogba (olomoyoyo)	96	64.0
Alabameji (twin)	124	82.7

Source: Field Survey, 2024

Farmers preference on banana and plantain varieties

Table 3 showed that respondents ranked Cardaba (mean=2.10) first, PITA 17 (mean=2.09) second, FHIA 21 (mean=1.95) third, and BITA 3 ($\bar{x}$=1.64) fourth. This indicates that respondents preferred to plant Cardaba and PITA 17 in the improved banana/plantain variety category, which is consistent with the findings of Weltzien *et al.* (2019).

The results of local varieties in Table 2 also revealed that both Ijeshaloba and Asogba ($\bar{x}$= 2.39) were ranked first by respondents, Agbagba ohun ($\bar{x}$= 2.30) was ranked third, and Alabameji ($\bar{x}$= 2.05) was placed seventh as the least cultivated local variety indicated by respondents.

The aggregated score of improved and local varieties revealed that farmers in the study area preferred local varieties ($\bar{x}$= 2.22) over improved varieties ($\bar{x}$= 1.95). The most popular locally grown varieties were Ijeshaloba, Asogba (olomoyoyo), and Agbagba ohun (false horn type). This implies that the banana/plantain farmers in the study area preferred the local varieties to the improved varieties, and this may result from the unavailability of the improved varieties (Lamessa, 2021).

Table 3: Farmers' Preferred banana/plantain varieties by respondents

Banana/plantain Varieties	Highly Preferred	Preferred	Not Proffered	Mean	Rank
Improved varieties					
Cardaba	36.0	38.0	26.0	2.10	1st
PITA 17	35.3	38.7	26.0	2.09	2nd
FHIA 21	22.0	50.7	27.3	1.95	3rd
BITA 3	12.0	40.0	48.0	1.64	4th
Average score				**1.95**	
Local varieties					
Ijeshaloba	46.7	46.0	7.3	2.39	1st
Asogba (olomoyoyo)	46.7	46.0	7.3	2.39	1st
Agbagba ohun (False horn type)	47.3	35.3	17.3	2.30	3rd
Ifenla	45.3	35.3	19.3	2.26	4th
Agbagba erin (Elephant type)	36.0	38.0	26.0	2.10	5th
Koloko (alabameta)	34.7	38.7	26.7	2.08	6th
Alabameji (twin)	31.3	40.0	28.7	2.05	7th
Average score				**2.22**	

Source: Field Survey, 2024

Farmers' preference criteria for banana and plantain varieties

Table 4 showed the results of farmers' preferences criteria for bananas and plantains in Ilesha. According to the findings, respondents ranked high market value ($\bar{x}$=3.75) first, bunch length ($\bar{x}$=3.74) second, number of fingers per bunch ($\bar{x}$=3.52), and good post-harvest storage ($\bar{x}$=2.94) as the least preferred criteria for banana and plantain plantations. This result suggests that high market value, bunch length, and number of fingers per bunch were the primary selection criteria for banana and plantain plantation varieties in the study area, which is consistent with the findings of Robertson *et al.* (2024).

Table 4: Farmers' preference criteria of banana and plantain varieties

Reasons	SA	A	D	SD	Mean	Rank
High market value	76.7	21.3	2.0	0	3.75	1st
Bunch length	75.4	23.3	1.3	0	3.74	2nd
Number of fingers per bunch	61.4	29.3	9.3	0	3.52	3rd
Finger length	47.3	50.7	2.0	0	3.45	4th
High productivity	52.0	40.0	6.7	1.3	3.43	5th
Taste and Sweetness	44.0	42.0	12.7	1.3	3.29	6th
Resistance to pests and diseases	44.7	35.3	18.7	1.3	3.23	7th
Tolerance to drought	44.0	27.4	25.3	3.3	3.12	8th
High nutritive value	37.3	37.4	24.0	1.3	3.11	9th
Good post-harvest storage	21.3	55.4	19.3	4.0	2.94	10th

Source: Field Survey, 2024; SA=Strongly Agree, A= Agree, SD=Strongly Disagree and D=Disagree

Constraints to plantation of preferred banana/plantain varieties

Table 5 showed that the most common constraints in banana/plantain production were pests and diseases ($\bar{x}$=3.74), low soil fertility ($\bar{x}$=3.34), insufficient extension delivery to farmers ($\bar{x}$=3.28), and farmers' access to markets ($\bar{x}$=2.63). This finding shows that the occurrence of pests and diseases, low soil fertility, and insufficient extension delivery systems to farmers were the primary obstacles faced by banana/plantains farmers in cultivating preferred varieties of banana/plantains in the study area. The result aligns with the assertions of Acheampong *et al*. (2018) and Olumba and Onunka (2020) that stated that banana and plantain production were mostly limited by pests and diseases.

Table 4.5: Constraints facing the cultivation of preferred banana and plantain varieties

Constraints	**Highly severe**	**Severe**	**Less severe**	**Not a constraint**	**Mean**	**Rank**
Incidence of pests and diseases	75.4	23.3	1.3	0	3.74	1st
Low soil fertility	57.3	26.0	10.0	6.7	3.34	2nd
Inadequate extension service delivery system to farmers	54.7	24.0	16.0	5.3	3.28	3rd
Post-harvest deterioration of roots	45.3	30.0	22.0	2.7	3.18	4th
Illiteracy of farmer	44.7	30.7	16.0	8.6	3.11	5th
Shortage of good/quality planting material	21.3	55.4	19.3	4.0	2.94	6th
Low awareness of available varieties	33.4	31.3	24.0	11.3	2.87	7th
Lack of agricultural inputs	33.4	30.0	25.3	11.3	2.85	8th
Unavailability of planting materials during planting season	24.7	35.3	32.0	8.0	2.77	9th
Access to market	21.3	35.4	28.0	15.3	2.63	10th

Source: Field Survey, 2024; SA=Strongly Agree, A= Agree, SD=Strongly Disagree and D=Disagree

Hypothesis 1: On relationship between the socio-economic characteristics of the respondents and their preferences for banana/plantain varieties

Table 6 showed that socio-economic factors had significant influences on respondents' preferences for banana/plantain varieties at LR χ^2=41.22. The study found a negative significant correlation (β=-0.199, $p<0.05$) between education and preference for local banana/plantain varieties among the respondents. This implies that the higher the education of the farmers, the more preferences for local varieties of banana/plantain which could be due to the suitability of local varieties to their farming conditions. This result corroborates the findings of Udomkum *et al.* (2021) who found education to be one of the socio-economic determinants of plantain and plantain-based products in the Central Region of Cameroon and Oyo State, Nigeria.

Also, age had a negative significant relationship (β=-2.436, $p<0.05$) with the farmers' preference for improved varieties of banana/plantain. This indicates that as their age increases, they are less likely to prefer improved varieties of banana/plantain. The younger farmers are always open to taking risks for potential benefits which could result to higher yields (Figurek *et al.*, 2023).

Education also had a significant positive relationship (β= 0.143, $p<0.05$) with the farmers' preference for improved varieties of banana/plantain. This implies that respondents are more likely to prefer improved banana and plantain varieties as their level of education rises. Farmers' preferences for improved banana/plantain varieties are greatly influenced by their level of education, and policies aimed at educated farmers may be influenced by this (Jamaldin *et al*., 2024).

Additionally, banana/plantain farm size positively influenced (β= 0.236, $p<0.01$) the farmers' preference for improved varieties. This suggests that farmers are more likely to prefer the improved banana/plantain varieties as their farm sizes increase because larger farms can afford the possible risks and rewards of implementing improved varieties (Abiola *et al.*, 2023).

Table 6: Multinomial regression result of socio-economic factors that influenced varietals of banana/plantain preferred by farmers

Preference for banana/plantain varieties	Parameters	Local varieties	Improved varieties
Age (years)	β_1	-0.002(-0.405)	-0.013(-2.436)*
Household size (persons)	β_2	-0.024(-1.613)	-0.004(-0.234)
Education	β_3	-0.199(-2.871)*	0.143(2.585)*
Banana/plantain farm size (acres)	β_4	0.006(1.336)	0.236(2.845)**
Banana/plantain farming experience (years)	β_5	-0.015(-0.844)	0.009(1.260)
LR Chi2	41.22		
Prob > Chi2	0.0015		
Log likelihood	-32.3713		

Source: Field Survey, 2024
Values in parenthesis are t–values
* P≤0.05 and ** P≤0.01

CONCLUSION AND RECOMMENDATIONS

The study therefore concluded that the banana/plantain farmers still prefer to grow local varieties of banana/plantain due to high market value, farmers' bunch length, and number of fingers per bunch. Although the incidences of pests and diseases, low soil fertility and inadequate extension delivery system to farmers posed severe challenges to the farmers for commercial cultivation of preferred varieties. In order to increase the preference for banana/plantain varieties in the study area at high level, agricultural research institutions concerned with genetic breeding of improve banana and plantain varieties should focus on developing varieties with higher attributes for attribute for bunch length, and number of fingers per bunch to boost farmers' prospect for high market value for banana/plantain produce. Extension agents in the study area should train banana/plantain farmers on best agronomic practices that help to tackle the problems of incidence of pest and diseases as well as low soil fertility. The extension agents can create a link platform through which farmers can reach for timely access to improved banana/plantain varieties for plantation in the study area.

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