



## FACTORS INFLUENCING THE ADOPTION OF IMPROVED PINEAPPLE PRODUCTION PRACTICES IN EDO STATE, NIGERIA

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### ABSTRACT

The study focused on the factors influencing the adoption of improved pineapple production practices in Edo State, Nigeria. Data were collected from 80 respondents selected across two agricultural zones in the State. Data were analyzed using frequency count, percentage and mean while Chi-square was used to analyze the hypothesis. The results showed that majority (62.25%) of the respondents were male, belonged to the modal class of 40-45 years, married (45.0%) and educated (61.2%). A higher proportion (45.0%) of the respondents operated a farm size of 3-4 hectares, earned an income range of ₦70,000- ₦79, 000 per annum (22.5%) and belonged to association (73.8%). Factors such as cost of innovation (mean = 2.85), relevance of innovation (mean = 2.77), availability farm inputs associated with the technology (mean = 2.68), timeliness (mean = 2.68), source of the technology (mean = 2.56), cultural acceptability (mean = 2.42) and compatibility with the exiting practices (mean = 2.40) were important factors affecting the adoption of improved pineapple production in the study area. Constraints such as inadequate credit/finance (mean = 3.60), unavailability of improved seeds (mean = 3.46), pest and disease problems (mean = 3.44), labour shortage (mean = 3.44), high cost of farm chemicals (mean = 3.44), land procurement problem (mean = 3.42), inadequate transportation facilities (mean = 3.41), seed procurement problems (mean = 3.41), insufficient preservative/storage facilities (3.36), poor market (mean = 3.33), lack of technical know-how (mean = 3.30), insufficient irrigation facilities (mean = 3.23) and inadequate extension services (3.18) were the major constraints affecting the adoption of improved farm practices in pineapple production. The chi-square result revealed that significant relationship existed between respondents' sex ( $\chi^2 = 5.00$ ), marital status ( $\chi^2 = 38.125$ ), level of formal education ( $\chi^2 = 21.500$ ), farming experience ( $\chi^2 = 31.475$ ), household size ( $\chi^2 = 8.450$ ), farm size ( $\chi^2 = 27.100$ ), income ( $\chi^2 = 25.300$ ), membership of association ( $\chi^2 = 18.050$ ) and the adoption of improved farm practices in pineapple production. It was concluded that pineapple production in the study area is constrained by several factors which are capable reducing farmers' productivity and possibly force them out of production. The study recommends that relevant extension agencies should link farmers with sources of farm inputs and possible of funds.

**Keywords:** Adoption, Constraints, Delta State, Improved pineapple, Production practices.

### INTRODUCTION

Pineapple is an important food which can be eaten fresh or in a processed form. It is among the most popular and nutritious tropical fruit cultivated in most tropical and sub-tropical countries, because its fruits contains antioxidants such as vitamins A and C which are known to reduce the oxidative damage in the body caused by free radicals and chelating metal (Nwachukwu, Nwobodo and Udoye, 2017).

Improved production practices are only useful when they are used by farmers. No matter how well these practices perform in research stations where they are developed, if they



are not utilized by farmers, the primary aim of their development will not be actualized, especially if the farmers' are not positively disposed to these improved practices. There is an urgent need to examine the farmers' present situation taking into cognizance the possible factors that might influence or limit farmers' ability to adopt improved production practices. Alapka and Onemolease (2017) had stated that use of obsolete and traditional farm technologies and farmers' inability to adopt improved farm technology being brought to them as innovation has been one of the major problems affecting farmers' efficiency in production.

Certain innovations are often adopted slowly by farmers and several aspects of adoption remain poorly understood (Ugboh and Izah, 2002). This could be due to lack of awareness and understanding on how and when improved technologies are to be used. In Nigeria for instance, institutions which deliver extension services were considered as important for the distribution of improved technologies, yet the number of these trained extension agents have not significantly increased over the years compared to the farmers they are to offer extension services (Haruna and Abdullahi, 2013). Apart from these efforts of extension service delivery to farmers, the sustainability of pineapple production improved technologies by smallholder farmers in Edo State is largely unknown. According to Nwachukwu *et al.* (2017), though Nigeria occupies a notable position in pineapple production in Africa and the world at large, however, the countries have not fully tap into the economic potentials of the crop, therefore reflecting the inefficiency in production. Despite the increase in the quantity of food crop produced in Nigeria annually and the important roles pineapple plays in the economy, not much increase has been found in pineapple production in the study area and the little produced are faced by a number of challenges, thus, reflecting a low yield in pineapple in the area. To this end, it therefore becomes imperative to examine the factors influencing the adoption of improved pineapple production practices in Edo State, Nigeria with the specific objectives of: identifying and describing the socio-economic characteristics of pineapple farmers in the study area; determining the factors associated with the adoption of improved pineapple production practices; and ascertaining the constraints limiting the adoption of production technologies by pineapple farmers in the study area. The study also tested the hypothesis that there is no significant relationship between farmers' socio-economic characteristics and the adopting of improved pineapple practices.

## **MATERIALS AND METHODS**

### **The Study Area**

The study was carried out in Edo State, Nigeria. The State is situated on latitude  $05^{\circ} 44'N$  and  $07^{\circ} 34'N$  and longitude  $06^{\circ} 04'E$  and  $06^{\circ} 43'E$  of the Equator (Egunyanga, 2010). The State has 18 local government areas (LGAs) with its administrative headquarters in Benin City with a land area of 17, 802 square kilometers. It is delineated into three agricultural zones namely; Edo South, Edo Central, and Edo North agricultural zones. With the 3.2 growth rate per annum, the state population was projected to 4,718,579 in 2018.

### **Sampling Techniques**

The study is limited to the factors associated with the adoption on improved practices in pineapple production. Multi-stage sampling technique was adopted in the selection of respondents. The first stage was the purposive selection of two agricultural zones in the state namely Edo South and Edo Central because of the high presence of pineapple farmers. The second stage involve the purposive selection of two local government areas from each of the selected agricultural zones because of high intensity of pineapple production (Esan West and



Esan Central in Edo Central and Orhionwon and Uhomwode in Edo South) given a total of four local government areas. At the third stage, five communities were randomly selected from each of the four LGAs bringing it to a total of twenty communities. The fourth and final stage involved the random sampling of four respondents each from the selected communities bringing the total respondents to 80.

### **Method of Data Collection**

Data were collected from the respondents with the use of questionnaire. In order to ensure the validation of data gathering instruments, it was presented to experts in the field of agricultural extension and rural sociology for assessment, criticisms and possible suggestions. The factors associated with the adoption of improved pineapple production practices was determined using a three point Likert scale measured as follows very important (coded 3), important (coded 2), and not important (coded 1). The level of importance was determined using a mean score of 2.0 computed as follows:  $3 + 2 + 1 \div 3 = 2.0$ . Factors with mean  $\geq 2.0$  was regarded of important factors while mean score of while factors with  $<2.0$  were regarded as not important.

The constraints limiting the adoption of improved production practices in pineapple production was determined using a four point Likert scale computed as follows: very serious (coded 4), little serious (coded 3), serious (coded 2) and little serious (coded 1). The seriousness of the constraints was determined using a mean score of 2.50 computed as follows:  $4 + 3 + 2 + 1 \div 4 = 2.50$ . Constraints with mean score  $\geq 2.50$  was regarded as serious while constraints with mean  $<2.50$  were regarded as not serious.

### **Method of Data Analysis**

The test-re-test method of establishing reliability of scale was equally used. A correlation coefficient of 0.833 was obtained indicating the reliability of the instrument. Data collected was analyzed using descriptive statistical tools such as frequency, mean and percentage; inferential statistical tool Chi-square was used to test the hypothesis.

## **RESULTS AND DISCUSSION**

### **Socio-economic Characteristics of Improved Pineapple Farmers**

Table 1 show that 62.25% of the respondents were male while 37.5% were female suggesting pineapple production in the study area is practiced by both genders. The modal age group of the respondents was 44-45 years representing 25.0% of the total respondents. This age bracket indicate that majority of the respondents were fairly young and in their productive age. A higher proportion (45.0%) of the respondents was married who probably engage in pineapple production to cater for their families. The farmers were quite educated with 61.2% having formal education. This level of education will have a great influence on the farmers' decision in adopting innovation. Onyemekonwu (2019) that farmers' level of education greatly influences their decision-making and adoption of innovation. A higher proportion of the respondents (27.5%) belonged to the modal class of 20-24 years of farming experience with having a household size of 4 persons and below. This suggests that the respondents may depend on external source for farm labour as the supply of labour within the family may be inadequate. Majority (45.0%) of the respondents operated a farm size of 3-4 hectares indicating that pineapple production cultivation in the study area is largely cultivated on a small scale.



**Table1:** Distribution of Respondents by Socio-economic Characteristics (n = 80)

Variables	Frequency	Percentage
<b>Age</b>		
25-29	13	16.3
30-34	10	12.5
35-39	13	16.3
40 – 44	20	25.0
45-49	9	11.3
50-54	5	6.3
55 and above	10	12.5
<b>Sex</b>		
Male	50	62.5
Female	30	37.5
<b>Marital status</b>		
Married	36	45.0
Single	14	17.5
Divorced	18	22.5
Widowed	5	6.3
Separated	7	8.8
<b>Level of formal education</b>		
No formal education	31	38.8
Primary education	27	33.8
Secondary education	18	22.5
Post-secondary education	4	5.0
<b>Farming experience</b>		
5-9	16	20.0
10-14	10	12.5
15-19	10	12.5
20 – 24	22	27.5
25-29	18	22.5
30-34	3	3.8
35-39	1	1.3
<b>Household size</b>		
4 and below	53	66.3
5-8	27	33.8
<b>Farm size (hectare)</b>		
< 1	5	6.3
1-2	25	31.3
3-4	36	45.0
5 and above	14	17.5
<b>Income range (₦/per annum)</b>		
20,000 - 29,000	6	7.5
30,000 - 39,000	6	7.5
40,000 - 49,000	4	5.0
50,000 - 59,000	6	7.5
60,000 - 69,000	12	15.0
70,000 - 79,000	18	22.5
80,000 - 89,000	12	15.0
90,000 - 99,000	14	17.5
100,000 and above	2	2.5
<b>Membership of Association</b>		
Yes	59	73.8
No	21	26.3

Source: Field survey data (2018)



The highest proportion of the respondents (22.5%) earns an income range of ₦70,000-₦79, 000 per annum. This is an indication that the annual income of the respondents is low compared to the National minimum wage of ₦18,000. The implication of this result is that pineapple farmers may force out of pineapple farming as a result of the low income derived. However, majority (73.8%) belonged to association which could place at advantage in seeking for fund and needed assistance from government and relevant agencies.

**Factors Associated with the Adoption of Improved Pineapple Production Practices**

Table 2 show the factors associated with the adoption of improved pineapple production practices. As shown in the table, factors with mean 2.0 and above were regarded as important factor.

**Table 2: Factors Associated with Adoption of Improved Pineapple Farm Practices (n = 80)**

<b>Factors</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Mean*</b>
<b>Cost of adopting the technology</b>			
Important	12	15.2	2.85
Very important	67	84.8	
<b>Relevance of the technology</b>			
Important	18	22.8	2.77
Very important	61	77.2	
<b>Availability farm inputs associated with the technology</b>			
Not important	1	1.3	2.68
Important	23	29.1	
Very important	55	69.6	
<b>Timeliness</b>			
Not important	3	3.8	2.68
Important	19	24.1	
Very important	57	72.2	
<b>Source of the technology</b>			
Not important	3	3.8	2.56
Important	29	36.7	
Very important	47	59.5	
<b>Cultural acceptability</b>			
Not important	10	13.0	2.42
Important	25	32.5	
Very important	42	54.5	
<b>Compatibility with the exiting practices</b>			
Not important	4	5.1	2.40
Important	39	50.0	
Very important	35	44.9	

\*Mean ≥ 2.0 = important factor and mean < 2.0 = Not important

The result revealed that factors such as cost of innovation (mean = 2.85), relevance of innovation (mean = 2.77), availability farm inputs associated with the technology (mean =



2.68), timeliness (mean = 2.68), source of the technology (mean = 2.56), cultural acceptability (mean = 2.42) and compatibility with the existing practices (mean = 2.40) were important factors affecting the adoption of improved pineapple production in the study area. The result suggests that pineapple production in the study area is faced with several problems which might affect its production. Alakpa and Onemolease (2014) had noted that insufficient capital and inadequate farming equipment were the some of the major problems hindering farmers' adoption of improved farm practices that would have improved their production.

### **Constraints Faced by Improved Pineapple Production**

The constraints faced by respondents in the adoption of improved pineapple production are shown in Table 3. The results show that the constraints with mean 2.50 and above were regarded as serious constraints. The result revealed that constraints such as inadequate credit/finance (mean = 3.60), unavailability of improved seeds (mean = 3.46), pest and disease problems (mean = 3.44), labour shortage (mean = 3.44), high cost of farm chemicals (mean = 3.44), land procurement problem (mean = 3.42), inadequate transportation facilities (mean = 3.41), seed procurement problems (mean = 3.41), insufficient of preservative/storage facilities (3.36), poor market (mean = 3.33), inadequate technical know-how (mean = 3.30), insufficient irrigation facilities (mean = 3.23) and inadequate extension services (3.18) were the major constraints associated with pineapple production in the study area. Other factors include unavailability of improved fertilizer, (mean 3.15) and Poor access to farm chemicals such as herbicides and insecticides (mean = 3.09). The result suggests that farmers in the study area are faced with several problems which are likely to affect their production output in terms of yield and income.

Chi-square was employed to test the hypothesis that states that, there is no significant relationship between farmers' socio-economic characteristics and the adopting of improved pineapple practices. The result is presented in Table 4. The chi-square result revealed that significant relationship existed between respondents' sex ( $\chi^2 = 5.00$ ), marital status ( $\chi^2 = 38.125$ ), level of formal education ( $\chi^2 = 21.500$ ), farming experience ( $\chi^2 = 31.475$ ), household size ( $\chi^2 = 8.450$ ), farm size ( $\chi^2 = 27.100$ ), income ( $\chi^2 = 25.300$ ), membership of association ( $\chi^2 = 18.050$ ) and the adoption of improved farm practices in pineapple production. Age ( $\chi^2 = 11.350$ ) had no significant relationship with the adoption of improved farm practices in pineapple production.



**Table 3:** Constraints Associated with Adoption of Improved Farm practices in Pineapple Production (n = 80)

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>	<b>*Mean</b>
<b>Inadequate credit/finance</b>			
Little serious	9	11.5	3.60
Serious	13	16.7	
Very serious	56	71.8	
<b>Unavailability of improved sucker</b>			
Not serious	1	1.4	3.46
Little serious	6	8.6	
Serious	23	32.9	
Very serious	40	57.1	
<b>Pest and disease problems</b>			
Not serious	1	1.3	3.44
Little serious	8	10.1	
Serious	25	31.6	
Very serious	45	57.0	
<b>Labour shortage</b>			
Little serious	9	12.0	3.44
Serious	24	32.0	
Very serious	48	60.8	
<b>High cost of farm chemicals</b>			
Not serious	2	2.5	3.44
Little serious	9	11.4	
Serious	20	25.3	
Very serious	48	60.8	
<b>Land procurement problems</b>			
Little serious	13	17.8	3.42
Serious	16	21.9	
Very serious	44	60.3	
<b>Inadequate transportation facilities</b>			
Not serious	1	1.3	3.41
Little serious	8	10.5	
Serious	26	34.2	
Very serious	42	56.0	
<b>Sucker procurement problems</b>			
Not serious	2	2.6	3.41
Little serious	6	7.9	
Serious	27	35.5	
Very serious	41	53.9	
<b>Insufficient preservative/storage facilities</b>			
Not serious	1	1.3	3.36
Little serious	9	11.5	
Serious	29	37.2	
Very serious	39	50.0	

\*Mean score  $\geq 2.5$  = Serious constraint and mean score  $< 2.5$  = Not serious constraint



**Table 3:** Constraints Associated with Adoption of Improved Farm practices in Pineapple Production (n = 80) Cont'd

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>	<b>*Mean</b>
<b>Poor market</b>			
Little serious	13	17.1	3.33
Serious	25	32.9	
Very serious	38	50.0	
<b>Insufficient technical know-how</b>			
Not serious	1	1.3	3.30
Little serious	10	13.0	
Serious	31	40.3	
Very serious	35	45.5	
<b>Use crude implements</b>			
Not serious	1	1.3	3.28
Little serious	19	24.1	
Serious	16	20.3	
<b>Insufficient of irrigation facilities</b>			
Not serious	1	1.4	3.23
Little serious	13	17.8	
Serious	27	37.0	
Very serious	32	43.8	
<b>Inadequate extension services</b>			
Not serious	3	3.9	3.18
Little serious	17	22.1	
Serious	20	26.0	
Very serious	37	48.1	
<b>Unavailability of fertilizers</b>			
Little serious	20	27.0	3.15
Serious	23	31.1	
Very serious	31	41.9	
<b>Poor access to farm chemicals (herbicides and insecticides)</b>			
Not serious	1	1.3	3.09
Little serious	19	25.0	
Serious	28	36.8	
Very serious	28	36.8	

\*Mean score  $\geq 2.5$  = Serious constraint and mean score  $< 2.5$  = Not serious constraint

### **Relationships between Socio-economic Characteristics and Adoption of improved Pineapple Farm Practices**

Table 4 presents relationships between socio-economic characteristics and adoption of improved pineapple farm practices. The past studies have shown that female farmers are less reluctant to adopt improved farming technologies relative to their male counterpart (Onemolease, 2001). Education facilitates farmers' capacity to work with improved farm





technologies. A significant relationship has been reported among both variables (Onyemekonwu, 2019). Farming experience has been reported to influence farmers’ decision to adopt innovation. Alakpa and Onemolease (2014) reported that farmers with more farming experience tend to appreciate and consequently adopt improved technology. A possible explanation for the significant relationship between household size and the adoption of improved farm practices in pineapple production could be that farmers with large farm size are likely to cultivate larger expanse of land, produce more and consequently require more production knowledge. Similar result was Tolobgense, Mesini and Tsaso (2006). The significant relationship for farm size could be that farmers with large farm size are more likely to produce more and being willing to adopt improved farm practices for their production. The significant relationship between farmers’ income and the adoption of improved farm practices in pineapple production could be explained by the fact that farmers with relatively high income are able to afford the cost involved in the technology. A positive and significant relationship between income and adoption of improved farm practices has been reported by Igbokwe (2000). The findings of this study corroborate that of Alabi and Kehinde (2003). A possible explanation of the significant relationship between membership of association and the adoption of improved farm practices could be that farmers who belonged to association may have raised fund from their association and willing to invest their fund and as such are willing to adopt. It could also be that they have been privileged to access improved farm practices with good return as a result of their membership, as such are more willing to adopt improved farm practices.

**Table 4:** Relationships between Socio-economic Characteristics and their Adoption of Improved Pineapple Farm practices (n = 80)

<b>Variables</b>	<b>Chi-Square</b>	<b>Df</b>	<b>P-value</b>
Age	11.350	6	.078
Sex	5.000	1	.025**
Marital status	38.125	4	.000***
Level of formal education	21.500	3	.000***
Farming experience	31.475	6	.000***
Household size	8.450	1	.004**
Farm size	27.100	3	.000***
Income	25.300	8	.001***
Membership of Association	18.050	1	.000***

\*\*\* = Significant at 1% ( $P \leq 0.01$ ); \*\* = Significant at 5% ( $P \leq 0.05$ )

## CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, it was concluded that pineapple production and the adoption of improved farm practices in pineapple production in the study area is faced with several constrains which are capable of negatively affecting the production performance of the farmers, thereby forcing the farmers out of production. It was therefore recommended that:

- i. Relevant agencies such as the extension agency should link farmers with sources of farm inputs. This will enable farmers have access to needed farm inputs such as improved sucker and farm chemical



- ii. Farmers should be advised to actively form farmers group such as cooperative societies, this will make them better positioned in seeking loan and grants from government and other financial institutions. By so doing, they can source fund that will help boost their production.
- iii. Special training should be organized by the extension agency to build the farmers capacity in pineapple production. Such training should focus on pest and disease control measures, preservative and storage techniques and marketing opportunities for pineapple.

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