

# **Assessment of Awareness and Utilization of Cocoa Production Technologies Among Farmers in Oyo-State, Nigeria**

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## **ABSTRACT**

The study examined farmers' awareness and utilization of cocoa production technologies in Oyo State, Nigeria. Specifically, the study described the socio economic characteristics of the respondents, ascertained the levels of awareness and utilization of cocoa production technologies and identified the sources of information on cocoa production technologies by farmers. Multi stage random sampling was used to select one hundred and twenty (120) cocoa farmers. Data was collected using a comprehensive questionnaire and analysis was done using means, frequencies percentages, Chi square and Pearson Product Moment correlation (PPMC). The result revealed that 62.4% of the respondents were within age bracket (<30- 50) years, male 83.3%, married 76.6%, means house hold size 7.5 and means farm size 4.1ha. There was relative high awareness (60.8%) of cocoa production technologies among respondents. Also, there was high utilization of site selection/land preparation, control of pest insect and pathogens, regular weeding and timely harvesting /processing ( $x= 1.0$ ), use of improved cocoa varieties, shade management and regular pruning ( $x=0.9$ ). However, there was low utilization of gapping up of missing/death stands and planting period and spacing( $x=0.7$ ), cocoa rehabilitation ( $x=0.5$ ) and appropriate fertilizer application with a means of 0.6. About 60% of the respondents accessed information from cocoa Research Institute of Nigeria (CRIN). Chi-square analysis showed that there was significant relationship ( $p, < 0.005$ ) between age ( $x=19.233$ ) and utilization of cocoa production technologies. However, the significant relationship was not found between sex ( $x=0.754$ ), marital status ( $x=3.359$ ), religion ( $x=1.416$ ), level of education ( $x=2.254$ ) and utilization of cocoa production technologies. PPMC analysis ( $r=0.633$ ) revealed that there was positive significant relationship between awareness and utilization of cocoa production technologies by respondents. Farmers need to be trained on various cocoa rehabilitation methods and improved cocoa varieties should be made available at affordable price to farmers.

*Keywords: Assessment, awareness, utilization, technology, cocoa, farmer*

## **1. INTRODUCTION**

Cocoa has been in cultivation for more than 100 years in Nigeria. It was introduced into Nigeria in the late 19th century (1). Cocoa is the leading agricultural export of the country and Nigeria is currently the world's fourth largest producer of cocoa, after Ivory Coast, Indonesia and Ghana (2). Cocoa relevance can be examined in term of its contribution to the nation's economy. Cocoa was the most important agricultural export crop during 1960-1970,

contributing significantly to foreign exchange earning of the country. Of non-oil exports in Nigeria, cocoa has been dominant over decades till now. It accounted for over 50% of the total export in the 1970s, and over 60% in 1980. However, since the 1970s, its share steadily declined from 49% in 1989 to 22% in 1998 (3). As noted by (4), fourteen, out of the thirty-six states in Nigeria produce cocoa and they are grouped into three categories according to their level of production. The groups are: higher ~~producer~~ producing states (Ondo, Cross River and Osun); medium ~~producer~~ producing states (Edo, Ogun, Oyo, Ekiti, Abia, Delta and Akwa-Ibom) ~~as well as and low less producer produceing~~ states (Kwara, Kogi, Taraba and Adamawa).

According to (5) cocoa production in Nigeria has been on a downward trend in recent years due to low productivity from ageing cocoa tree and low technology ~~uptake~~ adoption among the farmers.

Cocoa Research Institute of Nigeria (CRIN) with research mandate on Cocoa, kola, Coffee Cashew and Tea, in 2011 developed and released eight improved varieties of cocoa which is early maturing and are highly ~~tolerante~~ to diseases. Pods of these newly developed genetically improved and high yielding varieties which are capable of producing 1800kg-2000kg/ha/year of dry beans, compare to old varieties (Amelenado) that produces 250kg-350kg/ha/year of dry beans was distributed freely as planting materials to cocoa farmers across all the fourteen cocoa producing states during the period of year 2011-2015 in line with Federal Government Agricultural Transformation Agenda (ATA). Following the release of these eight new varieties, CRIN established two hectares of cocoa seed gardens in each of these identified cocoa growing fourteen states ~~identified as cocoa growing~~. These new gardens make improved cocoa hybrids available to farmers and promote vegetative propagation (6).

The recommended cocoa production technologies among farmers are; site selection/land preparation, use of improved cocoa varieties, shade management, planting period and spacing (3m x3m), control of pest/insect and pathogens, regular weeding, cocoa rehabilitation, gapping up of missing/death stands, regular pruning, appropriate fertilizer application and timely harvesting/processing (7). The awareness and utilization of these cocoa production technologies will not only increase farmers' income but also improve their standard of living.

### **Objectives of this study**

The general objectives of this study was to examine the awareness and utilization of cocoa production technologies among farmers in Oyo State Nigeria

Specific objectives were to;

- (1) describe the socio-economic characteristics of cocoa farmers in the study area
- (2) determine levels of awareness of cocoa production technologies by farmers in the study area
- (3) determine levels of utilization of cocoa production technologies by farmers in the study area
- (4) identify sources of information on cocoa production technologies by farmers in the study area.

### **Hypotheses of the study**

The following null hypotheses were set for the study;

Ho1 There is no significant relationship between socio-economic characteristics of farmers and the utilization of cocoa production technologies in the study area.

Ho2 There is no significant relationship between awareness and utilization of cocoa production technologies among farmers in the study area.

## 2. MATERIAL AND METHODS

A multistage sampling procedure was used in selecting farmers for the study. In the first stage, Oluyole local government area of Oyo state was purposively selected because of its agrarian nature and large numbers of cocoa farmers ~~in the local government~~, (9) also its nearness ~~and local exposure~~ to agricultural technology transfer institute like Cocoa Research Institute of Nigeria. The local government is made of 10 wards out of which 6 wards were purposively selected due to higher cocoa production activities ~~in large quantities~~. Two villages were randomly selected in each of the six wards to make a total of 12 villages selected for the study. 10 cocoa farmers were randomly selected in each village to make a total sample size of 120 respondents.

The level of awareness of cocoa production technologies were measured by asking farmers to indicate whether they were aware of the stated cocoa production technologies with response option of "yes" and otherwise "no". Furthermore, the percentages were shaped and categorized with awareness ranking low awareness or high awareness.

The level of utilization of cocoa production technologies was captured by using a 3 point Likert type rating scale namely Regularly=3, occasionally=2 and never=1. Thereafter, Grand mean was calculated, mean above grand mean represents high utilization while mean scores that is less than or equal to grand mean implies low utilization.

Descriptive statistics such as frequency counts, percentages and means were used to analyze the objectives while the hypotheses were tested with chi-square and Person product moment correlation (PPMC).

## 3. RESULTS AND DISCUSSION

### Socioeconomic characteristics

Table 1 shows that the mean age of the respondents was 46 years while greater percentage of respondents (62.4%) are within age bracket <30-50 years. This implies that most of the farmers are still young and expected to be active farmers. This is in consonance with (10) who stated that age of farmers is a strong factor in adoption of innovation. The majority (73.3%) of the respondents were male implying that men are more involved in cocoa production than women in the study area. Cocoa production requires routine management practices that are considered to be hard for female to cope with. This is in agreement with (11), who observed the male dominance of cocoa production is attributed to drudgery associated with it. The table also revealed that majority of the respondents (76.6%) are married while 10.8% are single, about 7.5% and 5.0% are divorced and widowed respectively. This implies that marriage is highly cherish in the study area.

According to the Table 1, 88% of the respondents had formal education (i.e. primary education and above). This corroborates with the findings of (5) that found out that 91% of the farmers had formal education and this is expected to have influence in the decision making ability of farmers as education tends to drive away ignorance. Also, from the table, 80% of the farmers have house hold size above five (5) persons the result agrees with (12,13) as they found out that, a larger house hold size has the capacity to relax the labour problems during introduction of new technology. The result further shows the mean farm size of 4.1 hectares, there is every tendency for farmers with larger farm size to adopt and utilize improved technology as result of economics of scale this is in consonance with (14)

that explained that farm size plays a critical role in utilizing and adopting process of technology.

**Table 1. Distribution of socio-economic characteristics of the respondents**

VARIABLE	FREQUENCY	PERCENTAGES	MEAN
<b>AGE</b>			
<30	20	16.6	
31-40	21	17.5	
41-50	34	28.3	
51-60	29	24.3	
ABOVE61	29	13.3	46YEARS
<b>SEX</b>			
MALE	100	83.3	
FEMALE	20	16.7	
<b>MARITAL STATUS</b>			
SINGLE	13	10.8	
MARRIED	92	76.6	
DIVORCED	09	7.5	
WIDOWED	06	5.0	
<b>EDUCATIONAL STATUS</b>			
NO FORMAL EDUCATION	32	26.7	
PRIMARY EDUCATION	34	28.3	
SECONDARY EDUCATION	35	29.2	
TERTIARY EDUCATION	19	15.8	
<b>HOUSEHOLD SIZE</b>			
1-5	40	33.3	
6-10	55	45.8	
11-15	20	16.7	
16-20	5	4.2	7.5
<b>FARM SIZE</b>			
1-5	93	77.5	
6-10	26	21.7	
11-15	1	0.8	4.1 HECTARES
<b>TOTAL</b>	120	100	

Source: Field survey 2020

#### **Awareness of cocoa production technologies**

Table 2 shows that majority of the farmers (98.3%) were aware of site selection/land preparation while 96.7% were aware of regular weeding, 95% of the respondents were aware of control of pest /insect and pathogens and timely harvesting /processing. Also,

90.8%, 85.8% and 85% were all aware of regular pruning of cocoa tree, shade management and gapping up of missing /death stands respectively. However, 57.5% of the respondents were not aware of cocoa rehabilitation methods in the study area, efforts should be geared towards creating awareness about various cocoa rehabilitation techniques/methods.

**Table 2a. Distribution of respondents' level of awareness of cocoa production technologies**

COCOA PRODUCTION TECHNOLOGIES	AWARE		NOT AWARE	
	F	%	F	%
SITE SELECTION	118	98.3	2	1.7
USE OF IMPROVED COCOA VARIETIES	84	70	36	30
SHADE MANAGEMENT	103	85.8	17	14.2
PLANTING PERIOD AND SPACING(3M X3M)	81	67.5	39	32.5
CONTROL OF PEST INSECT AND PATHOGENS	114	95.0	6	5
REGULAR WEEDING	116	96.7	4	3.3
COCOA REHABILITATION	51	42.5	69	57.5
GAPPING UP OF MISSING/DEATH STANDS	102	85	18	15
REGULAR PRUNING	109	90.8	11	9.2
APPROPRIATE FERTILIZER APPLICATION	73	60.8	46	39.2
TIMELY HARVESTING/PROCESSING	114	95.0	6	5

**Source:** Field survey, 2020

Table 2b shows result of categorization of [respondents/respondent's](#) levels of awareness of cocoa production technologies farmers had relative high awareness (60%) of cocoa production the technologies, with this result, there is tendency for farmers to adopt and use these technologies

**Table 2b. Categorization of cocoa farmers' levels of awareness of cocoa production technologies**

CATEGORIZATION	FREQUENCY	PERCENTAGE
LOW	47	39.2
HIGH	73	60.8
<b>TOTAL</b>	<b>120</b>	<b>100</b>

Source: Field Survey, 2020.

### Utilization of cocoa production technologies

Table 3 shows that 85.8% 72.5% ,84.2%, and 86.6%of the respondents regularly utilized site selection/land preparation, control of pest/insect and pathogens, regular weeding and timely harvesting respectively with mean score 1.0, indicating high utilization. Also, 69.2%,60% and 75.8% of the respondents regularly utilized shade management, use of improved cocoa varieties and regular pruning with mean score of 0.9 respectively, shows high utilization. In addition to that, 49.2% and 40.8%of the respondents occasionally utilized gapping up of missing/death stands and plant period and spacing respectively with mean score 0.7, indicating low utilization. However, 43.45% of the respondents with mean score 0.5 never utilized cocoa rehabilitation methods, indicating low utilization.

**Table 3. Distribution of respondents' level of utilization of cocoa production technologies.**

COÇA PRODUCTION TECHNOLOGIES	REGULARLY		OCCASIONALLY		/NEVER		MEAN
	F	%	F	%	F	%	
SITE SELECTION	103	85.8	10	8.3	6	5.8	1.0
USE OF IMPROVED COCOA VARIETIES	72	60.0	24	20.0	5	4.2	0.9
SHADE MANAGEMENT	83	69.2	27	22.5	10	8.3	0.9
PLANTING PERIOD AND SPACING(3M X3M)	61	50.8	49	40.8	9	8.4	0.7
CONTROL OF PEST INSECT AND PATHOGENS	87	72.5	29	24.2	4	3.4	1.0
REGULAR WEEDING	101	84.2	16	13.3	3	2.5	1.0
COCOA REHABILITATION	38	31.7	30	25.0	52	43.4	0.5
GAPPING UP OF MISSING/DEATH STANDS	47	39.2	59	49.2	14	11.7	0.7
REGULAR PRUNING	91	75.8	24	20.0	5	4.2	0.9
APPROPRIATE FERTILIZER APPLICATION	47	39.2	57	47.5	16	13.3	0.6
TIMELY HARVESTING/PROCESSING	104	86.6	15	12.5	1	0.8	1.0

Source: Field survey, 2020

*Note: Any mean that is less than or equal to grand mean means low utilization while any mean that greater than grand mean means high utilization*

### Sources of information on cocoa production technologies

The results in Table 4 shows that majority (60%) of the respondents got information about cocoa production technologies through research institute (CRIN). This may be as a result of closeness of research institute to the farmers. This finding disagrees with (15) who said that cocoa farmers in Nigeria prefer to get information through radio .15% of the respondents got their information from fellow farmers while 12.5% got their own through farmers' organization (CFAN). Lastly, 10.8% and 1.67% of the respondents got their information through extension agent (ADP) and NGOS respectively

**Table 4. Distribution of cocoa farmers' sources of information on cocoa production technologies**

SOURCES INFORMATION	FREQUENCY	PERCENTAGE
RESEARCH INSTITUTE (CRIN)	72	60
EXTENSION AGENT (ADP)	13	10.8
FARMERS ORGANIZATION (CFAN)	120	100
NGOS	2	1.67
FELLOW FARMERS	18	15
<b>TOTAL</b>	<b>120</b>	<b>100</b>

### Hypotheses testing

Results of test of relationship between respondents selected socio-economics characteristics and utilization of cocoa production technologies by farmers are shown in table 5. It was discovered that a significant relationship existed between age of farmers ( $\chi^2=19.233$ ;  $p<0.05$ ) and utilization of cocoa production technologies. This implies that the aged farmers that are of age tend to have longer years of farming experience and the more experienced the farmers are the more he or she is likely to utilize the production technologies. However, the significant relationship was not found between sex( $\chi^2=0.754$ ), Marital status( $\chi^2=3.359$ ), Religion( $\chi^2=1.416$ ) and level of education ( $\chi^2=2.254$ ).

**Table 5. Chi-square analysis of relationship between respondents' socio-economic characteristics and utilization of cocoa production technologies**

VARIABLES	X2-VALUE	DF	P-VALUE DECISION
AGE	19.233	5	0.002 SIGNIFICANT
SEX	0.754	1	0.440 NOT SIGNIFICANT
MARITAL STATUS	3.359	2	0.187 NOT SIGNIFICANT
RELIGION	1.416	2	0.493 NOT SIGNIFICANT
EDUCATIONAL LEVEL	2.254	3	0.521 NOT SIGNIFICANT

Table 6 presents the test of relationship between farmers' awareness and utilization of cocoa production technologies. There was a positive significant relationship between awareness and utilization of cocoa production technologies ( $r = 0.633$ ,  $p < 0.01$ ). This implies that the more farmers are aware of cocoa production technologies they utilize it.

**Table 6: Test of relationship between awareness and utilization of cocoa production technologies (PPMC)**

VARIABLES	R-VALUE	P-VALUE	DECISION
AWARENESS AND UTILIZATION	0.633	0.000	SIGNIFICANT

#### 4. CONCLUSION

There was high awareness and utilization of cocoa production technologies among farmers in Oyo State except for planting period/spacing, cocoa rehabilitation, gapping up of death/missing stands and appropriate fertilizer application that had low usage. Efforts should therefore be made by government and relevant agencies to train cocoa farmers on various methods of cocoa rehabilitation and appropriate spacing (3m x 3m) of the crop. Also, improved varieties of cocoa should be made available to farmers at affordable prices in order to boost production.

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