



## **Original Research Article**

# **Factors Influencing the Output of Cocoa Farmers in Atakunmosa East Local Government Area, Osun State, Nigeria**

<sup>1</sup>Busari, A.O., <sup>2</sup>Idris-Adeniyi, K.M., <sup>2</sup>Alabi, A.A. and <sup>1</sup>Owojori, B.A.

<sup>1</sup>Department of Agricultural Economics and Agribusiness Management  
Osun State University, Osogbo, Nigeria

<sup>2</sup>Department of Agricultural Extension and Rural Development  
Osun State University, Osogbo, Nigeria

Corresponding author: hamed.busari@uniosun.edu.ng

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### **Abstract**

This study investigated the factors which determine the output of cocoa farmers in Atakunmosa East Local Government Area, Osun State, Nigeria. A multi-stage sampling procedure was used to select 120 respondents as sample for the study. Primary data used for the study were collected through a field survey using a structured interview schedule. Data analysis was carried out using frequencies, percentages, means, and regression techniques. Results of the descriptive analysis revealed that the majority of the respondents were middle-aged (mean = 48.91) (79.2%), married (72.5%), male (78.3%), Christians (52.5%), farmers with male-headed (80.00%) household, having a mean household size of 7 persons per household. Most (48.3%) of the respondents had secondary education; and were members of co-operative societies (90%). The mean cocoa farm size, years of cocoa farming experience, and cocoa output were 6.03 hectares, 19 years, and 4.22 tons per year respectively. Most (51.26%) cultivated crops apart from plantain were kola-nut, plantain, and oil palm. The major problems faced by the farmers were the high cost of hired labour (65.83%), unavailability of farm inputs (65.00%), high transportation cost (55.83%), low prices (52.5%), high cost of chemicals (54.17%) and inadequate extension services (49.10%). Regression results showed that cocoa farm size positively influenced the output of cocoa, while the number of chemicals negatively influenced the output of cocoa in the study area. The study concluded that there was a low level of cocoa production in the study area due to the fact that increase in output is achieved by increasing the area of land under cultivation, which is not sustainable. Thus, appropriate technology should be developed from the point of view of the cocoa farmers in order to improve their output.

**Keywords:** Cocoa famers, cocoa production, cocoa farming, Osun State

### **Introduction**

In the 1960s, Nigeria's export earnings from major agricultural export commodities (cocoa, coffee, groundnut, and ground units) contributed significantly to the Gross Domestic Product (GDP) of the country.

Nigeria was the second leading producer and exporter of cocoa, with the commodity contributing over 70% of the total agricultural exports and accounting for about 15% of the world cocoa output (CBN, 1990, Osuntogun *et al.*, 1997, and Verter, 2016). The discovery of oil in the 1970s and the subsequent huge revenue generation from its exports retarded the growth of the agricultural sector leading to a progressive decline in the contribution of the sector to GDP. The influx of foreign exchange earnings from oil exports led to the total neglect of the agricultural sector (Dutch Disease) which significantly reduced the sector's output and productivity (Oyejide, 1986; Daramola, 2005).

According to World Cocoa Foundation (WCF) (2009) and Osarenren *et al.* (2016), one of the significant agricultural activities in tropical West Africa is commercial cocoa farming, with the cocoa sub-sector providing a major source of revenue to many West African countries. Globally, cocoa farming provides a means of livelihood to cocoa farmers with production averaging three million tons annually. Also, a large percentage (80% to 90%) of the cocoa farmers are smallholders, especially in Africa and Asia where cocoa farm size ranges from 2 hectares to 4 hectares, producing about 300 kilograms to 400 kilograms of cocoa beans per hectare in Africa, and 500 kilograms per hectare in Asia. However, average cocoa farms sizes in America are slightly larger than those of Asia and America, averaging an output of 500 kilograms to 600 kilograms per hectare (WCF, 2009 and WCF, 2009). Cocoa is a major agricultural export commodity in Nigeria. In 2010, cocoa production was responsible for 0.3% of the agricultural Domestic Product (agGDP) (Awoyemi and Aderinoye, 2019). In the same year, Nigeria ranked the second largest exporter behind Cote d'Ivoire in the West Africa sub-region (Abolagba *et al.*, 2010). In 2014, Nigeria became the fourth largest cocoa producer coming behind Cote d'Ivoire, Ghana, and Indonesia, and accounting for only 12% of total world cocoa production (ICCO, 2014). Currently, Nigeria is still ranked fourth in world cocoa production (Awoyemi and Aderinoye, 2019). According to FAOSTAT (2018), cocoa is a significant contributor to the economic growth of the country, contributing an average of US\$ 313.33 million to the annual GDP of Nigeria. In terms of earnings from foreign exchange, the amount of revenue accruing from cocoa exports rose from 243.39 million US\$ in 1980 to 598.19 million US\$ in 2017.

In recent years, various challenges such as climate change, ageing trees with declining production, emerging pests and diseases, and continuous use of obsolete technology in cocoa production by the farmers have resulted in a continuous decline in domestic production and productivity of cocoa (Uwagboe *et al.*, 2017). Also, other problems that have impeded domestic expansion in cocoa production and productivity include improper funding and capital investment to ensure sustainable production and productivity of cocoa, and improper incentives and infrastructure for upcoming cocoa farmers to motivate them and improve their cocoa production and productivity (Nazir *et al.*, 2021).

Consequently, the continuous decline in cocoa production and productivity in Nigeria has resulted in an annual revenue loss estimated at \$1 billion (Nazir *et al.*, 2021). The South-Western part of the country is responsible for over 70% of annual cocoa production (Michael and Nzeka, 2011). Therefore, this study examined the factors influencing the output of cocoa farmers in Atakumosa Local Government Area of Osun State, Nigeria. Specifically, the objectives of the study were to examine the socio-economic characteristics of cocoa farmers in the study area, examine the level

of cocoa production in the study area, and determine the factors affecting the output of cocoa farmers in the study area.

## **Methodology**

### ***Study Area***

This study was carried out in Atakumosa East Local Government Area (LGA), Osun State, Nigeria. The headquarters of the LGA is Iperindo in the east of the area at 7 30'00"N 4 49'00"E. It has an area of 288km<sup>2</sup>, and a population of 76,105 with 38,945 males and 37,160 females at the 2006 census (Osun State Government, 2014). Atakumosa East LGA comprises of more than ten villages. The major economic activity of the people is agriculture with crops such as plantain, banana, oil palm, cocoa and kolanut under extensive cultivation.

### ***Population of the study***

The population of the study comprised all cocoa farmers in the study area.

### ***Source of Data and Method of Data Collection***

This study utilized primary data collected with the aid of a well-structured interview schedule.

### ***Sampling procedure***

A two-stage random sampling technique was adopted to select 125 respondents for the study. In the first stage, cluster sampling was used to select 10 villages where cocoa farmers are concentrated in the Local Government Area. Thereafter, 5 villages were randomly selected from the 10 villages. Finally, 24 respondents were randomly selected from each village making a total of 120 respondents as the sample for the study.

### ***Analytical Framework***

Descriptive statistics such as percentages, means, frequency distributions, and tabulation were used to describe the socio-economic characteristics of the cocoa farmers. The multiple regression analysis was used to determine the factors influencing the output of cocoa production in the study area. The empirical model that was used in the study is expressed as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, e_t)$$

Where, Y Yield/Output of cocoa (tons),

- X<sub>1</sub> represents size of cocoa farm (hectares),
- X<sub>2</sub> represents household size (number of people),
- X<sub>3</sub> represents quantity of chemicals (litres),
- X<sub>4</sub> represents cocoa farm experience (years),
- X<sub>5</sub> represents years of formal education (years),
- X<sub>6</sub> represents age (years),
- X<sub>7</sub> represents primary occupation, and
- e<sub>i</sub> represents the stochastic error term.

## Results and Discussion

### *Socio-economic characteristics of cocoa farmers*

Results of the descriptive analysis as shown in Table 1 reveals that the majority of the cocoa farmers were middle-aged (79.2%) (mean = 48.91), married (72.5%), male (78.3%), Christians (52.5%), farmers with male-headed (80.00%) households, and with a mean household size of 7 persons. Most (48.3%) of the respondents had secondary education; were members of co-operative societies (90%).

**Table 1:** Socio-economic characteristics of the cocoa farmers (n=120)

<b>Variables</b>	<b>Freq.</b>	<b>%</b>	<b>Mean</b>	<b>Variables</b>	<b>Freq.</b>	<b>%</b>	<b>Mean</b>
<b>Age (years)</b>				<b>Experience (years)</b>			
30-39	24	20.0	<b>48.91</b>	5-10	37	30.83	<b>19.00</b>
40-49	41	34.2		11-16	13	10.83	
50-59	30	25.0		17-22	21	17.50	
60-69	16	13.3		23-28	30	25.00	
70-79	8	6.7		29-34	10	8.33	
80-89	1	0.8		35-40	9	7.50	
<b>Religion</b>				<b>Farm size (hectares)</b>			
Christianity	63	52.5		1-9	94	78.3	<b>6.03</b>
Islam	54	45.0		10-18	23	19.2	
Traditional	3	2.5		19-27	3	2.5	
<b>Head of household</b>				<b>Cooperative society</b>			
Yes	96	80.0		Members	108	90	
No	24	20		Non-members	12	10	
<b>Household size</b>				<b>Educational Status</b>			
0	5	4.2	<b>7 persons</b>	No formal education	19	15.8	
2-3	5	4.2		Primary education	13	10.8	
4-5	21	17.5		Secondary education	58	48.3	
6-7	35	29.2		Tertiary	30	25.0	
8-9	30	25.0		<b>Marital status</b>			
10-11	14	11.7		Single	20	16.7	
12-13	7	5.8		Married	87	72.5	
14-15	3	2.5		Separated	3	2.5	
			Divorced	2	1.7		
			Widowed	8	6.7		

Source: Field Survey, 2021

The mean cocoa farm size, years of cocoa farming experience, and cocoa output were 6.03 hectares, 19 years, and 4.22 tons per year respectively. Most (51.26%) cultivated crops apart from plantain were kola-nut, plantain, and oil palm. These results suggest that the majority of the cocoa farmers in the study area were middle-aged, large household-sized, married, male, secondary school leavers, and Christians highly experienced in cocoa production, which may have serious consequences on their cocoa output. These results agreed with the findings of Osarenren *et al* (2016) and Awoyemi and Aderinoye (2019).

### Level of cocoa production in the study area

Table 2 reveals that the majority (58.33%) of the cocoa farmers had their output in the range of 0.50-3.85 tons, with a mean of 4.22 tons per farmer per year. The result suggests that cocoa production in the study area was still under the small and medium scale of production.

The scale of cocoa production among the farmers may be linked to their socio-economic characteristics such as age, level of education, cocoa farming experience, and household size which may exert significant influence on the output of the cocoa farmers, and hence their scale of production. These results corroborate with those of Osarenren *et al.* (2016), and Awoyemi and Aderinoye (2019).

**Table 2:** Distribution of cocoa farmers according to their level of cocoa production (n=120)

Output (tons)	Frequency	Percentage
0.5-3.85	70	58.33
4.2-7.7	32	26.67
7.98-15.4	18	15.00
<b>Total</b>	<b>120</b>	<b>100.0</b>

Mean output of cocoa = 4.22 tons  
Source: Farm Survey, 2021

### Results of multiple regression analysis

The results of the regression model of the study is presented in Table 3. From the table, the coefficient of determination ( $R^2$ ) was found to be 0.83 showing that 83% of the variation in cocoa output was explained by the explanatory variables of the model. The F-statistics with a value of 80.60 was statistically significant ( $p < 0.01$ ) suggesting that the estimated regression model had a good fit. Cocoa farm size and cocoa farming experience positively influenced the output of cocoa farmers, though not significantly.

**Table 3:** Regression results

Variables	Coefficient	Standard error	t-value	Probability
Size of cocoa farm ( $X_1$ )	0.154	0.006	22.700	0.000**
Household size ( $X_2$ )	-0.008	0.012	-0.660	0.513
Quantity of Chemicals ( $X_3$ )	-0.000028	0.000013	-2.1800	0.031*
Cocoa farming experience ( $X_4$ )	0.009	0.005	1.910	0.058
Years of Formal Education ( $X_5$ )	-0.005	0.007	-0.790	0.428
Age ( $X_6$ )	-0.0003	0.004	-0.070	0.948
Primary Occupation ( $X_7$ )	0.012	0.032	0.380	0.703
Constant	0.663	0.201	3.300	0.001

$R^2 = 0.83$ ; Adjusted  $R^2 = 0.8246$ ;  $F = 80.90$ ; \* Significant at 5%; \*\* Significant at 1%.  
Source: Data Analysis, 2021.

However, the quantity of chemicals used negatively ( $P < 0.05$ ) influenced the output of cocoa farmers. The implication of these results is that improvement in cocoa output is achieved through an increase in cocoa farm sizes, leading to a low level of productivity among the farmers, showing that cocoa farmers in the study area do not employ improved cocoa production techniques and technologies to boost their output. Also, highly experienced cocoa farmers had the tendency to

record higher cocoa output than their inexperienced counterparts, affirming that the level of cocoa output in the study area is determined by farmers' experience in cocoa production.

In contrast, chemicals used in cocoa production by the farmers significantly reduce their level of cocoa output. This may not be unconnected with the utilization of obsolete and ineffective, but cheap chemicals to control pests and diseases on their cocoa farms which have negative consequences on their cocoa output.

## **Conclusion**

Based on its findings, the study concluded that there is a low level of cocoa production and productivity in the study area. An increase in the output of cocoa can be achieved by increasing the area of land under cultivation which is not sustainable. Also, there is the problem of pests and diseases which has limited cocoa productivity; this is reflected by the significance of the quantity of chemicals used.

## **Recommendations**

Based on the findings from the study, the following recommendations are made; there is a need for measures to encourage the adoption of improved varieties, technology, and management practices by the cocoa farmers in order to improve their output and productivity. This can be achieved through effective and efficient extension education for the highly experienced cocoa farmers. Cocoa farmers should be trained and encouraged to embrace cultural control of pests and diseases and minimize the use of chemical pests and diseases control. Production incentives such as highly subsidized cocoa production inputs (improved cocoa seedlings and agro-chemicals) should be provided by the government to cocoa farmers in order to boost their output.

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