

**ANALYSIS OF COCOA PROCESSING AND MARKETING IN ABIA STATE,  
NIGERIA**

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**ABSTRACT**

*The study analysed Cocoa processing and marketing in Abia State, Nigeria. It specifically assessed the socio-economic characteristics of the cocoa processors, the structure and conduct of cocoa processors, cost and returns, marketing efficiency and constraints to cocoa processing and marketing in the study area. A total of 120 cocoa processors and marketers were randomly selected from the selected local governments purposively chosen using a multistage sampling procedure. Structured questionnaire was used to elicit information from cocoa processors who also engage in marketing of cocoa. Data were analysed using descriptive and inferential statistics. Results show that majority (56.7%) of the processors and marketers were males, with a mean age of 51.35 years, literates (98.3%), married (86.7%), members of cooperative society (75%), had extension contact (60%) and have a mean household size of 5 persons with 11.2 years processing and marketing experience. Cost and return analysis revealed that cocoa processing and marketing is a profitable venture and the marketers were efficient at their trade. Multiple Regression result revealed that Age, Educational level, household size, were significant variables that influence marketing efficiency of processors and marketers in the study area. Constraints identified include; transportation, spoilage, price fluctuation amongst others. The study recommends among others the provision of infrastructure like modern processing facilities and good road network by government to improve efficiency in processing and marketing of cocoa.*

**Keywords: Cocoa processing, Cost-return, Efficiency, Marketing**

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**INTRODUCTION**

Agriculture remains an important sector of the economy and accounted for 42.1% Gross Domestic Product (GDP) in Nigeria and employed about 79% of the working population with about 80% of the country's poor working primarily in Agriculture (National Planning Commission, 2006). The need to diversify the productive base of the economy to reduce dependency on oil export and improve the agricultural sectors efficiency as well as intensify the growth potential of the private sector has placed cocoa enterprise as a topmost cash crop enterprise in Nigeria.

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Cocoa (Theobroma Cacao) is currently an important agricultural export crop in Nigeria with Nigeria producing about 5% of total world production (FAO, 2011). The contributions of cocoa to the nation's economic development are vast. In terms of foreign exchange earnings, no single agricultural export commodity has earned more than cocoa. A sizeable number of people are employed, both directly and indirectly in the cocoa sub-sector. In addition, it is an important source of raw materials, as well as a source of revenue to the economy. In terms of foreign exchange earnings, no single agricultural export commodity has earned more than cocoa (Nkang, 2009). Nigeria produces about 250,000 metric tonnes of cocoa (Adesina 2012). By these rating Nigeria competed favourable with other front liners in cocoa industry like Ivory Coast, Indonesia and Ghana. Prior to the oil boom of the mid 70's, Cocoa (Theobroma Cocoa) was one of the highest foreign exchange earners in Nigeria and for a long time the crop has been generating substantial foreign earnings for the country (Onwumere and Alimba, 2010; Folayan *et al*, 2007). Cocoa is used for drinks, candies, cosmetics, soap and pharmaceuticals. It is grown in fourteen states of Nigeria, which includes Abia, Akwa Ibom, Cross River, Delta, Edo, Ekiti, Ogun, Ondo, Osun, Oyo, Kogi, Kwara, Adamawa and Taraba States.

Cocoa Processors Association of Nigeria (CPAN) has been clamoring for the ban on exportation of unprocessed cocoa bean to encourage processing locally. There was an attempt by the Nigeria government to ban export of cocoa beans in 1990 to promote local industrialization, increase foreign exchange earnings, and facilitate technology transfer. However, the ban was short-lived because of policy failure and pressure from stakeholders, especially Cocoa Association of Nigeria (CAN) which stressed that local industrial processing capacity was inadequate for handling the national cocoa beans output (Olomola *et al*, 2012).

In West Africa, the cocoa beans are marketed dry. Marketing is the critical link between farmer production sector on one hand and non-farm sector, industry and urban economy. The role of marketing in developing any economy including agriculture cannot be over emphasized. It involves all the legal, physical and economic services which are necessary in moving products from produce to consumers (Olukosi, Isitor and Ode, 2005). Cocoa marketing ensures the flow of product from processors to consumers in the form, time and place of need. Buyers are in need of the product while the sellers in turn need to improve their socio-economic status through higher profits and enhanced income.

Despite the fact that marketing provides the means of meeting these necessities (utilities) involved in the flow of goods and services; and therefore has an important multiplier effect in the development of any economy it is beset with a lot of problems which include unorganized and inefficient marketing system arising from seasonal variations, transportation, processing, storage, grading and communication (Anyaeibunam *et al*, 2011). The activities of middlemen hamper the effective distribution of cocoa which result in the high price of the produce. The dissolution of the Cocoa marketing board and the subsequent free marketing system introduced has allowed for a lot of illegalities in the marketing system as government has little or no influence in their activity. Also, Shortage of cocoa processing factories also adds to the problem of cocoa

production and marketing in Nigeria and this have resulted to the inefficiencies recorded in the cocoa industry.

These underlying problems have therefore necessitated the analysis of cocoa processing and marketing in Abia State, Nigeria with specific objectives to: identify the socio-economic characteristics of cocoa processors and marketers in the study area, ascertain the processing method of cocoa in the study area, ascertain marketing channel for cocoa, examine the market structure and conduct of cocoa processors and marketers, determine cost and returns of cocoa processing and marketing, determine marketing efficiency of cocoa marketers in the study area, estimate the effect of socioeconomic variable on marketing efficiency of processors and identify constraints to cocoa processing and marketing in the study area.

## **MATERIALS AND METHOD**

The study was carried out in Abia State, Nigeria. The choice of Abia State for this study was termed to be appropriate given its antecedent in agriculture and food marketing particularly being an important cocoa growing state in Nigeria. Abia State occupies about 6,320 square kilometers and is bounded on the North and North East by the State of Anambra, Enugu and Ebonyi, to the West of Abia is Imo State, to the East and South East are Cross River and Akwa Ibom States and to the South is River State. It is one of the thirty-six states in Nigeria with seventeen local government areas and has a population of 2,845,380 (NPC, 2006). The farmers engage in Arable crop and livestock production such as cassava, yam, maize and sweet potatoes, poultry birds, goats and sheeps. Cocoa and oil palm are among the cash crops grown. The people also engage in processing, trading activities and civil service job.

Multistage sampling technique was used to select respondents for the study. Firstly, Ikwuano and Umuahia North were the two Local Governments purposively chosen because they are the major Cocoa producing areas in the State. Secondly, two communities from each of the selected Local Government Area (i.e Ibere, Oboro and Ibeku, Ohuhu respectively) were purposively selected due to high concentration of cocoa processing and marketing activities in the area. The third stage was the random selection of thirty processors who are also marketers from each of the communities, making it a total number of one hundred and twenty (120) Cocoa processors and this forms the sample size for the study. The sampling frame from which the Cocoa processors were selected was obtained from the Agricultural Development Program office in Abia State. Data were obtained with the use of structured questionnaire, administered through personal interview schedule. The questionnaire was designed to elicit information on processing and marketing activities, structure and conduct of Cocoa marketers, costs incurred in processing and marketing and constraints to Cocoa processing and marketing. Data were analyzed using descriptive statistics such as frequency distribution, percentages mean, and inferential statistics such as gross margin analysis, marketing efficiency as well as multiple regression technique.

The Gross Margin Analysis is given as;

$$GM = TR - TVC$$

Where;

GM = Gross Margin

TR = Total Revenue

TVC = Total Variable Cost

The net return represents the total profit and was determined using:

Net return = TR – TC and TC = TFC+TVC

Where;

NR = Net Return (profits)

TR = Total Revenue (price per bag x number of bags sold)

TC = Total Cost

TFC = Total Fixed Cost

TVC = Total Variable Cost

The marketing efficiency (ME) of the Cocoa marketers was computed using the marketing efficiency index model as specified by Olukosi and Isitor, (1990) as:

$$M.E = \frac{\text{Value added by marketing}}{\text{Total marketing cost}} \times 100$$

The implicit form of the multiple regression model used is sated as follows;

$$Y = f(X_1+X_2+X_3+X_4+X_5+X_6+X_7+X_8+X_9+e)$$

Where;

Y = Marketing efficiency (percentage)

X<sub>1</sub> = Sex (male = 1, female = 0)

X<sub>2</sub> = Marital status (married =1, single = 0)

X<sub>3</sub> = Age (years)

X<sub>4</sub> = Household size (number of persons)

X<sub>5</sub> = Level of Education (level of education attained)

X<sub>6</sub> = Processing and marketing experience (years)

X<sub>7</sub> = Corporative member (member = 1, non-member = 0)

X<sub>8</sub> = Access to credit

X<sub>9</sub> = Extension contact

e = Stochastic error term

## **RESULTS AND DISCUSSION**

### **Socio-Economic Characteristics of Cocoa Processors and Marketers**

Socio-economic characteristics of the respondents investigated in the study include sex, marital status, age, household size, level of education, years of experience, cooperative membership and extension contact. The results of the socioeconomic characteristics of the Cocoa processors are presented in Table 1. The result showed that 51.7% of the Cocoa processors and marketers were male while 48.3% were females. This implies that cocoa business in the study area was predominantly concentrated by male. Majority (86.7%) of the respondents were married while 13.3% were single. This implies that married people were predominated in cocoa processing and marketing. Majority (33.33%) of the processors were between the age brackets of 49-56 years with an average age of 54.63 years. This is an indication that the respondents were in their economic active age. Majority (95%) of the respondents has household size within 3 – 6 with a mean household size of approximately 5 persons. This shows that the respondents had relatively large household size and this implies that they could draw family labour which would be cheaper than engaging hired labour in certain Cocoa processing and marketing activities. This in turn could enhance their marketing performance in Cocoa business.

Approximately, 83 percent of the respondents had formal education. This shows that the Cocoa processors in the study area are literate. This implies that processing and marketing efficiency could be enhanced through embracing innovative processing techniques and marketing strategies. Majority (31.67%) of the respondents have between 10-13 years' experience in Cocoa processing and marketing with a mean experience of 11.2 years. Majority (75%) of the processors belonged to a cooperative society. Membership of cooperative societies could improve their access to financial and technical support in the form of credit and training and other input resources as well as market information. It would also improve their market access with a relatively fair price deal for their product. All these could have a multiplier effect which is expected to boost their sales and increase their income. Majority (65%) do not have access to credit as against 35% who have access to credit. Access to credit is an important factor needed to enhance processing and marketing efficiency of the respondent especially in the expansion of enterprise scale and acquisition of input resources. The result also revealed that 60% of the cocoa processors and marketers had extension contact. The implication is that extension contact can help improve their processing and marketing skills and to gain knowledge on best practices in the trade.

### **Method of Processing Cocoa in the Study area**

The process of Fermentation was identified as the method used in cocoa processing in the study area. Fermentation of cocoa beans is one of the most important operations in the preparation of the beans for market. As a rule, maximum return is obtained only from properly fermented cocoa. After harvesting the cocoa pod, it is opened by knocking it against a blunt object. The beans are removed and placed in a basket covered with plantain leaves for 5 – 7 days. This is

intended to reduce the water content in order to block enzymatic reactions. After the seven (7) days, the Cocoa beans are sun dried by spreading it on a level surface. The end product is then bagged and ready for market.

### **Marketing Channel of Cocoa in Abia State**

The marketing channel for Cocoa in the study area is presented in Figure 1. The Figure shows the marketing channel for Cocoa in the study area. Various pathways were identified as the channels through which cocoa gets to the final consumer. The Cocoa producer supplies cocoa to the processor and the movement continues to the exporters who are merchants and down to the wholesaler, to the retailer and finally to the consumer. In this channel, there are four (4) middlemen involved; they are the processor, exporter, wholesaler and retailer. Other alternative routes can be from processor to retailer and to the consumer. The marketing agent acts between the processors and the exporters. They create the market link between merchants (exporters) and the processors and in some occasion help processors sell their produce.

### **Market Structure and Conduct of Cocoa Processors**

#### **Market Structure**

Market structure is defined as the organizational and other characteristics of markets. It can also be defined as the characteristics of the markets either organizational or competitive that describe the nature of competition and the pricing policy followed in the market. In the study area, the processors buy Cocoa from the producers in their various farms and then process to cocoa beans. The processors who are also the marketers sell to buyers (exporters, wholesalers, retailers and the consumers) at ₦250 per Kg. There exist no entry barriers to either buyers or sellers. The product sold is homogenous. There is no individual marketer who has control over the market supply and price of cocoa. These characteristics liken the cocoa market in the study area to a perfect competition.

#### **Market Conduct**

Market conduct refers to the pricing and promotion strategies followed by the players in the market, in terms of their aims, objectives and decision making process. The market conduct is the pattern of commercial behaviour that firms follow in adjusting to the markets in which they sell or buy. These commercial behaviours arise from the existing market structure and include price determination behaviour, product behaviour, research and development, innovation, advertising, sales promotion policies, financial policy and collusion ([https://www.oerafrica.org/FTPFolder/Agshare/Marketing%20and%20Price%20Analysis/the\\_market\\_conduct.html](https://www.oerafrica.org/FTPFolder/Agshare/Marketing%20and%20Price%20Analysis/the_market_conduct.html), accessed 2/1/2020)

In the study area, the processors buy cocoa pods from producers and sell their processed cocoa as soon as they finish sun drying to various marketing agents (exporters, wholesalers, retailers and consumers). They sell at prices being reached by the seller/buyer bargain, no individual has the right to fix price or influence the quantity of cocoa supplied for sale. There is lack of

marketing information to enable processors and traders make meaningful market decision. Majority (90%) of the cocoa processors and marketers belong to a cooperative society.

### **Cost and Return of cocoa Processing and Marketing**

The result from Table 2 revealed the cost and return associated with cocoa processing and marketing in the study area. It showed that the average quantity of cocoa sold was 138kg/month and sold at ₦250/kg/month with a net profit of ₦13,141.9/kg/month. The total cost incurred was ₦21,358.1/kg/month with amount spent on purchasing unprocessed cocoa (₦14,500/kg/month) and labour cost (₦1,500/kg/month) capturing major cost components incurred by processors in the study area. The marketing margin realized by processors/marketers was 60% indicating that for every naira invested in the trade, ₦60.00kobo is gained which suggest that cocoa processing and marketing is a profitable venture in the study area and this amount can be enhanced through expansion of processing scale and collective trading. The result is in agreement with the findings of Ahamefula *et al.*, (2017).

### **Marketing Efficiency of Cocoa Processing and Marketing**

Marketing Efficiency is the ratio of output of marketing system (value added) to input used in marketing system. The model is stated as follows;

$$M.E = \frac{\text{Value added by marketing}}{\text{Total marketing cost}} \times 100$$

Total marketing cost

The Marketing efficiency was found to be 98.75% which denotes that Cocoa processing and marketing was economically efficient in the study area. This conforms to the findings of Folayan *et al.*, (2007) who found that Cocoa marketers were economically efficient.

### **Influence of Socio-economic Characteristics on the Marketing Efficiency of the Cocoa Processors**

The relationship between the socio-economic characteristics of the cocoa processors Marketing Efficiency is presented in Table 3. Four functional form were tried namely; Linear, Semi-log, Double-log and Exponential functions. The results show the multiple regression estimates of socio-economic characteristics of the Cocoa processors and marketers and their marketing efficiency. The model was tried in four functional forms, namely; linear, semi-log, double-log and exponential. Following statistical and econometric reasons, the linear form was chosen as the lead equation. This is because it provided the best fit. It has the highest value of coefficient of multiple determinations ( $R^2$ ). From the Table, it revealed that at 1% significant level, the age of cocoa processors and marketers had a positive relationship with marketing efficiency of cocoa marketed in the study area, indicating that marketing efficiency increases with increase in the age of the marketers. This is contrary to the findings of Bassey *et al.*, (2015) which opined that aged marketers are not innovative and lack the vigor to withstand the rigors in marketing. The explanatory variable, experience was significant at 5% level and it had a positive relationship

with marketing efficiency of cocoa processors and marketers in the study area, this implies that as the years of experience in processing and marketing increases, their efficiency in the business increases as the processors and marketers will have a good knowledge of the market information, forecast and predict what the future market holds and can apply strategies that can enhance their general performance in the trade. This result is in line with the findings of Obasi *et al.*, (2012).

Sex, marital status, and extension contact of the processors and marketers were negatively signed and not significant indicating that they are not factors that determine efficiency in the business of cocoa processing and marketing in the study area. Marital status has an inverse relationship and significant at 5% with marketing efficiency of processors and marketers indicating that marketing efficiency decreases with married processors and marketers than with unmarried processors and marketers. Level of education, household size, access to credit and cooperative membership coefficient were positively signed and significant at 1%, 5%, 1% and 5% respectively implying marketing efficiency increases with increase in each of these factors. Increase in them, increased cocoa sales among the respondents. Education brings to the processors and marketers a better understanding of what the market holds and how to maximize profit and minimize cost. The household size having a positive sign indicates that processors and marketers with large household size will be able to process and market more quantity because of the cheap labour provided by the household members and this can enhance income and also increase marketing outlet. Access to credit being positive implies that processors and marketers that have access to credit will have enough capital to purchase more cocoa and also help in buying some processing facilities. Cooperative membership being positive indicates that processors and marketers that belongs to a cooperative society have enough market information regarding price and have the opportunity to pool their resources together to enhance their processing and marketing activities, acquire cocoa supplies at subsidize rate and as well gain access to market in that way they can maximize efficiency in the trade.

The R<sup>2</sup> value was 0.98 indicating that the variations in marketing efficiency were explained by the explanatory variables. The F-ratio (301.920\*\*\*) was highly significant (1% significance level) indicating the overall significance of the model hence the hypothesis that, there is no significant relationship between the socioeconomic characteristics of cocoa processors and marketing efficiency was rejected and the alternative was accepted that there is a significant relationship between both variables.

### **Constraints of Cocoa Processing and Marketing**

Table 4 shows the constraints faced by processors in the processing and marketing of Cocoa in the study area. The results indicate that 68.83%, 85.83%, 76.67%, 45%, 56.67%, 50% and 40% of the respondents were faced with the problem of poor access road network, incessant price fluctuation, finance, spoilage, poor marketing information, poor processing and storage facilities and high transportation cost respectively. Problem of price fluctuation, finance and poor access

road were ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> respectively as major constraints faced by processors and marketers.

### **CONCLUSION AND RECOMMENDATION**

The study assessed cocoa processing and marketing in Abia State. It concludes that cocoa processing and marketing is a viable venture and the processors who were also marketers were efficient in cocoa trade. Market structure for cocoa was that of a perfect competition. The study recommends the provision of infrastructural facilities like well structured and functional market instituted to allow easy flow of market information, good processing and storage facilities to aid processing and marketing and reduce loss, good access roads to enable processors buy and convey their good to the market, processors and marketers should be encouraged to form agricultural cooperative societies to enhance collective trading, credit incentive price stabilization mechanism to enhance efficiency among processors and traders.

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**APPENDIXES**

**Table 1: Socio-economic Characteristics of Cocoa Processors and Marketers**

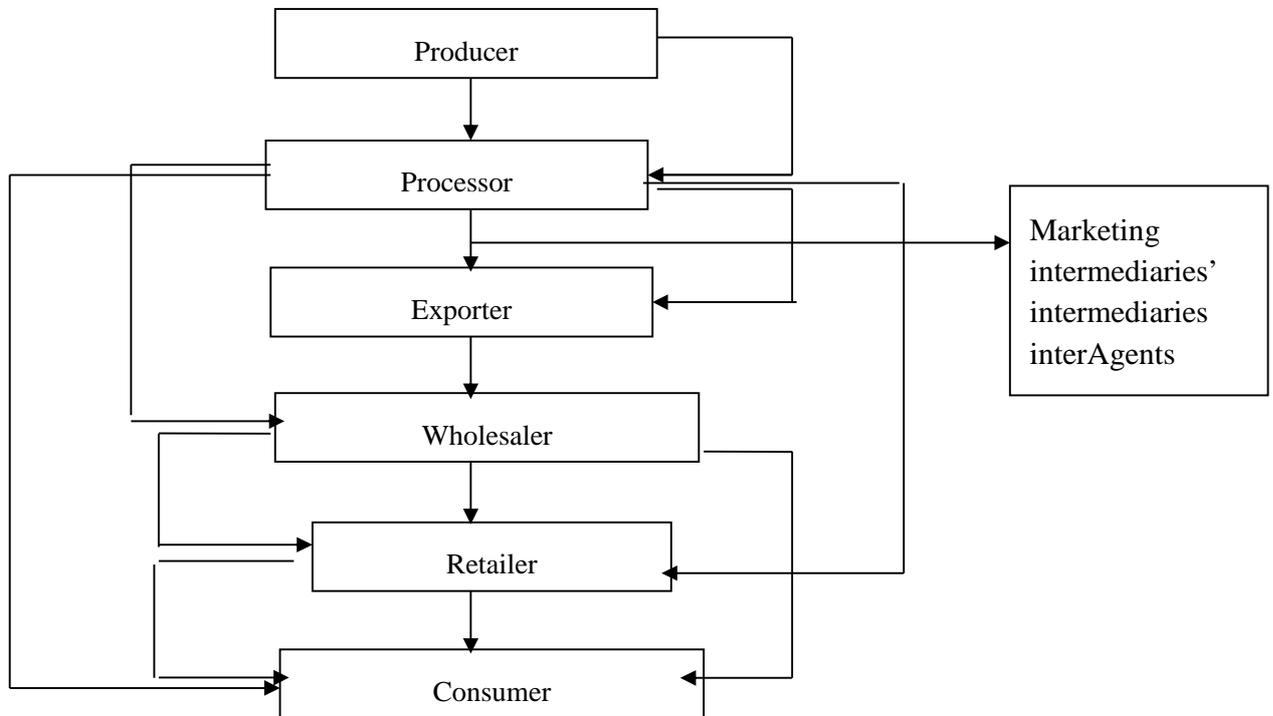
<b>Socioeconomic characteristics</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Mean</b>
Sex			
Male	62	51.70	
Female	58	48.30	
Marital status			
Married	104	86.70	
Single	16	13.30	
Age (years)			
33 - 40	12	10.00	
41 - 48	28	23.33	
49 - 56	40	33.33	
57 - 64	38	31.67	
65 - 72	2	1.67	51.35
Educational level			
No education	2	1.70	
Informal education	12	10.00	
Primary education	20	16.70	
Secondary education	52	43.40	
Tertiary education	34	28.30	
Household size (no of persons)			
3 - 6	114	95.00	
7 - 10	4	3.33	
11 - 14	2	1.67	4.88

Experience (years)	45 - 61		
2 - 5	20	16.67	
6 - 9	32	26.67	
10 - 13	38	31.67	
14 - 17	16	13.33	
18 - 21	8	6.66	
22 -25	6	5.00	11.20
Co-operative membership			
Non-member	30	25.00	
Member	90	75.00	
Extension contact			
No contact	48	40.00	
Contact with extension	72	60.00	
Access to credit			
No access	42	35.00	
Access to credit	78	65.00	
Total	120	100	

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Source: Field survey data, 2018

**Marketing Channel for cocoa**



**Fig. 1: Marketing channel for Cocoa in Abia State**

**Table 2: Cost-Return Analysis of Cocoa Processing and Marketing/Naira/KG/month**

Items	Unit	Avg. Quantity	Avg. Price (₦)	Unit	Total Value (₦)
<b>A. Revenue</b>					
Sales from processed Cocoa	(₦/kg)	138	250		34,500
<b>B. Variable Cost</b>					
Purchase price of unprocessed cocoa	(₦/kg)				14, 500
Market charges	(₦)		100		100
Transportation	(₦)		200		200

Loading & offloading	(₦)		600	600
Agent fees	(₦)	1	500	500
Labour	(₦)	2	750	1500
Total variable cost	(₦)			<b>17, 400</b>
<b>C. Fixed Cost</b>	(₦)			
Rent	(₦)			3,500
Depreciation on equipment:				
Basin	Number	2	58.3	116.6
Drying mat	Number	2	33.3	66.6
Knife	Number	2	12.5	25.0
Jute bag	Number	3	16.7	33.4
Scale	Number	1	83.3	83.3
Sickle	Number	2	12.5	25.0
Basket	Number	2	20.8	41.6
Tray	Number	2	33.3	66.6
Total fixed cost	(₦)	16	270.7	<b>3,958.1</b>
Total cost (B + C)				<b>21358.1</b>
Gross profit (TR – TVC)				17, 100
NET Profit (GP – TFC)				13,141.9
Marketing margin				60%
Marketing efficiency				61.53%

**Source:** Field Survey Data, 2018.

**Table 3: Influence of Socio-economic Characteristics on the Marketing Efficiency of the Cocoa Processors**

Variables	Linear	Semi-log	Double-log	Exponential
Constant	9.170 (0.914)	141.113 (1.317)	4.498 (11.480)***	4.763 (122.881)***
Sex	-0.071 (-0.515)	-0.025 (-0.183)	0.000 (-0.474)	0.000 (-0.737)
Age	0.094 (3.992)***	29.956 (3.342)***	0.031 (1.019)	0.000 (1.211)
Educational Level	0.056 (3.839)***	61.114 (3.217)***	0.124 (1.782)*	0.000 (2.099)**
Household size	2.090 (2.434)**	8.238 (1.985)**	0.024 (1.615)	0.006 (1.710)*
Marital status	-31.482 (-2.435)**	-32.407 (-2.229)**	-0.079 (-1.485)	-0.072 (-1.449)
Experience	0.176 (2.369)**	74.009 (2.537)**	0.234 (2.194)**	0.000 (1.710)*
Cooperative membership	30.024 (2.291)**	30.717 (2.109)**	0.080 (1.507)	0.075 (1.488)
Access to credit	1.028 (17.088)***	1.001 (16.235)***	0.003 (12.286)***	0.003 (12.660)***
Extension contact	-1.457 (-0.453)	-1.394 (-0.410)	-0.005 (-0.437)	-0.005 (-0.369)
F-ratio	301.920***	270.986***	184.883***	183.998***
R <sup>2</sup>	0.982	0.980	0.971	0.971

Source: Field survey data, 2018.

\*\*\*=1% significance level, \*\*= 5% significance level and \* =10% significant level

Figures in parenthesis are the t-values

**Table 4: Distribution of the respondents by constraints encountered in Cocoa processing and marketing**

<b>Problems</b>	<b>Frequency*</b>	<b>Percentage (%)</b>	<b>Rank</b>
Poor access road networks	79	68.83	3 <sup>rd</sup>
Incessant Price fluctuation	103	85.83	1 <sup>st</sup>
Finance	92	76.67	2 <sup>th</sup>
Spoilage	54	45.0	6 <sup>th</sup>
Poor market information	68	56.67	4 <sup>th</sup>
Poor processing and storage facilities	60	50.0	5 <sup>th</sup>
High transportation cost	48	40.0	7 <sup>th</sup>

**Source:** Field Survey Data, 2018.

Multiple Responses recorded\*