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Determinants of the responsiveness of cooperative farmers to the cocoa renaissance programme in Osun State, Nigeria

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A key policy instrument in the cocoa transformation agenda is to provide subsidized inputs for farmers to replace old grooves to increase cocoa production in Nigeria. The study examined the role of cocoa marketing cooperatives in enhancing the incomes of its member patrons in Osun State under the cocoa renaissance policy. Multi stage sampling method was used to select 100 respondents from four cocoa produce marketing unions in the State. Data obtained were analysed with descriptive statistics, budgetary analysis and the multiple regression technique. The study revealed that the average age of the respondents was 64.4 years and only 16% of the cocoa farms were developed after the commencement of the renaissance policy. The farmers operated an average of 5.4 ha farm sizes while inputs supplied respondents through cooperative societies were much cheaper compared to what obtained in the open market. The gross margin to enterprise was ₦387, 639 while the net income was ₦345, 282. The regression analyses revealed that while family size, age, level of education, farm size and cooperative experience were significant determinants of output, family size, farm size, cooperative experience and amount of cocoa marketed through cooperative societies were significant determinants of income realized in the cocoa enterprises. The study concluded that greater efforts should be put in place to attract younger and educated farmers to achieve policy objectives.

Key words: Renaissance, transformation agenda, marketing cooperatives, subsidize, agrochemicals, fertilizer, seedlings.

INTRODUCTION

The importance of cocoa to Nigeria's socioeconomic development cannot be overemphasized and has been documented in several empirical studies (Olayide, 1969; Olayemi, 1973; Folayan et al., 2006). Although its prime place has since been taking by petroleum production, cocoa remains the most important agricultural product as no other export commodity has earned more foreign exchange than it (Abang, 1984; Akinbola, 2001). It is a major employer of labour (Folayan et al., 2006) and also supplies raw materials to local industries. Unfortunately,

the production of the commodity has continued to dwindle while the standing of the nation among producers of the product has continued to diminish.   From a peak of 308,000 tonnes in early 1970s, output declined to 110,000 tonnes in 1981 and in spite of spirited efforts to increase output as engendered by the Structural Adjustment Programme (SAP), output only increased to 205, 000 tonnes in 2000 (Koekoek, 2003).

Major problems implicated in the dwindling fortunes of Nigeria in the production of cocoa included the old age of cocoa farmers (Amos, 2007) and the cocoa trees (Adegeye, 1977); incidence of pests and diseases; poor management of the economic deregulation system which affected product quality control (Ajayi and Okoruwa, 1996); depleted soil fertility, use of poor planting materials, poor maintenance of cocoa farms, defective method of harvesting, poor handling of post harvest process and inefficient agricultural extension service (Adenikinju et al., 1989). The adoption of SAP which liberalized the marketing of cocoa produce and the abolition of the Nigerian Cocoa Marketing Board led to the shipment of poor quality cocoa beans from Nigeria (Ajayi and Okoruwa, 1996) with serious implications for the demand and pricing of cocoa from Nigeria at the international commodity market. To worsen this, dwindling world market price of cocoa from US$3,000 per tonne in 2002 to US$1,860 in 2004 to US$1,580 in 2005 have according to Ogunleye and Oladeji (2007) crushed farmers' willingness to invest in measures to boost output.

In the attempt by the Nigerian government to diversify the nation's economic base, attention has shifted to the agricultural sector with cocoa production as key in the structural transformation of the economy. A key strategy is the efforts of government to rejuvenate cocoa production in the country through its Cocoa Renaissance Policy in 2000. The strategy adopted to achieve the policy objective were the provision of cocoa producing States with marketing grants to raise hybrids, disease resistant, high yielding and early maturing seedlings for distribution to the farmers at subsidized prices. The strategy adopted by government in supplying improved inputs and technology to the poor farmers follows the high input pay-off model. The model which posits that farmers are economically rational, productive and take wise economic decisions but have exhausted potentials available. Accessing new farm technologies and improved inputs to them will enhance their efficiency and hence output (Akinyosoye, 2005; Schultz, 1964). The success in achieving very high output from the development of new, high-yielding varieties of wheat in Mexico in the 1950's and rice in the Philippines in the 1960's lends credence to the relevance of the model in tackling the challenges confronting cocoa farm enterprises in Nigeria.

While farmers have responded to the new initiative of government, a major disincentive has been the dwindling prices of cocoa at the international commodity market and the size of this income that actually accrue to farmers as a large proportion of this are claimed by intermediaries (exporters, middlemen and assemblers) (Ogunleye and Oladeji, 2007). This affects their capacity to compete in the market place. However, the severity of the impact of the market price of the commodity as well as market imperfections will depend on national policies, production and marketing conditions as well as the existence and participation in socio-economic networks like the co-operative societies and farm organizations. Fortunately, the cocoa renaissance programme is taking place within the free market policy of government. While government is providing the necessary conducive policy environment and incentives, private commercial concerns like the cooperative societies should be able to tap into these initiatives to curb the unhealthy activities of market intermediaries and complement the government's goal of increasing output and incomes to cocoa producers.

Cooperatives are a voluntary association of persons or business enterprises owned by member patrons pursuing common goals and who contribute capital and business and is controlled by member patrons who run the affairs of the association along democratic lines (Gupta, 2012; Dogarawa, 2005; Adegeye and Dittoh, 1985). Key values of cooperatives include self-help, equality, equity, solidarity democratic control. Cooperatives harnesses the individual strengths and/or resources of members which on their own are too weak to be competitive in a free market system to meet their common economic, social and cultural needs. These are used to provide services or products at cost to members who share the net surplus as benefits. The close relations of members ensures trust and compliance with the rules and principles of the association (Aremu et al., 2013; Nkonya et al., 2010). These inherent advantages coupled with reduced costs in providing services to a large group of farmers in cohesive society is a veritable tool for government to explore to implement policy measures aimed at reaching a large group of atomized farmers in a free market system.

Cooperative societies according to Akinbola (2001) are out to promote fair trade as well as seek to give a higher share of the final consumer price directly to farmers through effective marketing system. Cooperative societies are able to buy farm inputs in bulk and sell to members (by cash or on credit) at cheaper prices at the beginning of the production year and pay higher prices to member- farmers through the maintenance of inventory and storage facilities. This enables the cooperative society to hold cocoa products when there is a glut and sell when market prices are more favourable. The incentives provided by the income raise is expected to provide an additional impetus for cocoa farmer members to take advantage of the policy initiatives to increase farm size, outputs and hence incomes. Since the introduction of the policy strategy in Osun state, little efforts have been made at examining its effect on the cocoa production

sub-sector in general and the impact of cocoa marketing cooperatives in exploiting the opportunities offered under the programme for the benefit of its member patrons in particular. Hence, this study aims at identifying the role of cocoa marketing cooperatives in enhancing the outputs and incomes of its member patrons under the cocoa renaissance programme in Osun State, Nigeria. The specific objectives were to:

(i) Examine the extent to which the policy initiative has influenced the farming decisions of cocoa farmers,
(ii) Evaluate factors determining responsiveness of farmers to the cocoa renaissance policy initiative in Osun State, and,
(iii) Analyse factors determining output and incomes among cocoa farmers

METHODOLOGY

Sampling technique and data collection

The study was carried out in Osun State, Nigeria. The State covers an area of approximately 14,875 sq/km and lies between longitude 4° and 5°E and latitude 7° and 8°N. The State is divided into 30 Local Government Areas (LGAs) and experiences two main seasons: the rainy season that runs through April and October, and the dry season that covers the rest of the year (November to March). Mean annual rainfall averages 1,570 mm while the mean annual temperature is about 27°C. The State lies within the tropical rainforest belt of the western uplands (Agboola, 1979) where climatic and edaphic factors provide the ideal environment for cocoa cultivation.

The multi stage sampling technique was employed to obtain necessary data from the major cocoa producing areas of the State. First, five Cooperative Marketing Unions involved in cocoa marketing were purposively selected. Each of these Unions were based in five LGAs namely: Ife Central, Ife East, Ifelodun, Boluwaduro and Boripe LGAs. From each of the Marketing Unions, four cooperative societies were randomly selected. In all, 20 cooperative marketing societies were selected. Finally, from each of these marketing societies, five member participants were randomly selected for interview. In all, 100 respondents were interviewed for this study.

Data analysis

Descriptive statistics, budgetary analysis and the multiple regression analytical techniques were used to analyse information obtained from the respondents. Descriptive statistics, including frequency counts, means and percentages were used to describe the socio-economic characteristics (including age, education level, family size, farm size) of selected cooperative member participants in the study area. Budgetary analysis was employed to estimate costs and returns to cocoa production using the gross margin as stated in Equation (1):

$$\pi_i = P_i Q_i - TCi \tag{1}$$

Where, π_i = gross margin per tonne (₦/tonne), P_i = price per unit of cocoa produced (₦), Q_i = cocoa output (tonne), and, TCi = total costs of production (fixed cost {FC} plus variable cost {VC}) (₦)

Variable costs (VC) included in the analysis were expenditures on labour, seedlings, fertilizers, agrochemicals and transportation. Items that could be used for more than a production cycle were classified as fixed costs (FC). These included cutlasses, sprayers and farm-bans.

Finally, two multiple regression models were used to estimate the socio-economic factors determining the production and marketing of cocoa through marketing cooperative channels as well as those determining the profitability of cocoa enterprises in the study area. The model on factors determining production and marketing of cocoa beans was specified as:

$$Q_1 = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, \varepsilon_i) \tag{2}$$

Q_1= output of cocoa (kg), X_1 = total cost of production (N), X_2= family size, X_3= age of respondents (years), X_4= educational level of respondents (years spent in formal schools), X_5= farm size (ha), X_6= age of cocoa farm (years), X7= experience in cooperation (years), ε_i = error term.

In terms of *a priori* expectations, X_1, X_4, X_5 and X_7 are expected to be positively correlated to farm output. X_2, could be either positively or negatively correlated depending on whether the family is a production or consumption unit. X_3 is expected to be positively correlated to farm output to a certain age where it starts to show a negative relationship as increasing age affects the productivity of farmers. X_6 is also expected to be negatively correlated to farm output as cocoa trees age beyond their prime productive years. The second model on factors determining the income realised from cocoa enterprises was also specified as:

$$Y_1 = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, \varepsilon_i) \tag{3}$$

Where, Y_1 = farm income (₦), X_8= output of cocoa produced and marketed through cooperative societies (kg), X_9= distance of farm to cooperative office (km). X_1, X_2, X_3, X_4, X_5, X_6, X_7, and ε_i are as defined earlier.

In terms of *a priori* expectations, X_1, X_4, X_5, $X_7$and X_8 are expected to be positively correlated to farm income while X_2, could be either positively or negatively correlated depending on whether it is a production or consumption unit. X_3 is expected to be positively correlated to farm income to a certain age where it starts to show a negative relationship as increasing age affects the productivity of farmers. X_6 and X_9 are expected to be negatively correlated to farm incomes. X_5 is expected to be positively correlated to farm income to a certain age where it starts to show a negative relationship as increasing age affects the productivity of farmers. Three functional forms of the regression models were fitted to the data namely the linear, semi-logarithm and the double logarithm models. The models that provided the best of fit were selected and discussed.

RESULTS AND DISCUSSION

Socioeconomic distribution of respondents

The age distribution of the respondents as shown in Table 1 indicated that 90% of the farmers were over 50 years old while only 4% aged less than 40 years. The mean age of the respondents was 64.4 years. This is slightly higher than that recorded among cocoa farmers by Adesiyan and Adesiyan (2012) and Idowu et al. (2007). A critical factor in the sustainability of the new

Table 1. Socio-economic characteristics of respondent farmers.

Variable	Frequency	Percentage	Cumulative percentage	Mean
Age (Years)				
21 – 30	3	3.0		
31 - 40	1	1.0	4.0	
41 - 50	6	6.0	10.0	64.4
>50	90	90.0	100.0	
Level of education				
Did not go to school	36	36.0		
Adult/Quaranic education	10	10.0	46.0	
Primary school education	19	19.0	65.0	
Secondary school education	26	26.0	91.0	
Technical/Teachers College	9	9.0	100.0	
Marital status				
Married	78	78.0	78.0	
Widowed	17	17.0	95.0	
Divorced	5	5.0	100.0	
Family size				
6 – 10	29	29.0		
11 – 15	43	43.0	72.0	13.1
16 – 20	28	28.0	100.0	
Farm Size (ha)				
≤ 2.5	8	8.0		
2.6 – 5.0	62	62.0	70.0	
5.1 - 7.5	20	20.0	90.0	5.4
7.6 – 10.0	5	5.0	95.0	
≥ 10.1	5	5.0	100.0	
Age of cocoa farms (years)				
≤ 10	16	16.0		
11 – 20	34	34.0	50.0	
21 – 30	46	46.0	96.0	20.8
31 – 40	2	2.0	98.0	
≥ 41	2	2.0	100.0	
Cooperative experience of farmers (years)				
≤ 10	9	9.0		
11 – 20	20	20.0	29.0	
21 – 30	52	52.0	81.0	24.5
31 - 40	7	7.0	88.0	
≥41	12	12.0	100.0	
Benefits derived from membership				
Access to inputs	96	96.0		
Access to credit	98	98.0		
Access to transportation of produce	77	77.0		
Marketing of produce	100	100.0		

Table 1. Contd.

Distance of farm to cooperatives (km)				
≤ 2.0	26	26.0		
2.1 – 4.0	55	55.0	81.0	3.1
4.1 – 6.0	16	16.0	97.0	
≥ 6.1	3	3.0	100.0	

Source: Field survey (2012).

Table 2. Input costs variations between cooperative societies and the open market.

Cocoa farm inputs	Input prices (₦) per unit at	
	Cooperative market outletsb	Open market outlets
Seedlings	5	10
Fertilizer	150	200
Ridomine	200	250
Copper sulphate	200	250
Harvesting equipment	290	317
Hoe	950	1,400
Cutlass/matchet	630	650

Source: Field survey (2012).

initiative will be the set of farmers that have keyed in to the new policy initiative. Clearly, most of the farmers were old, above their prime age of production and are most probably into cocoa farming as a way of life rather than the policy initiative. The policy has therefore not succeeded in attracting new and younger farmers to drive it. This is reflected in the age of the cocoa farms where only 16% of the respondents' farms were developed after the policy became operational. The remaining 84% were cultivated long before the policy came on board and the average age of the farms was 20.8 years (Table 1).

The level of education among the farmer respondents was very low as 36% did not even attend any school while 19% attended up to primary school. Only 35% of the respondents had either Grade II Teacher's College or Technical College education. The high level of illiteracy could not only hamper the farmers from participating in the new policy drive but also in acquiring new skills and accessing technical inputs (Ogundele and Okoruwa, 2006) necessary to modernize the cocoa production subsector. However, as members of cocoa produce marketing societies, they are key to the success of the cocoa renaissance policy initiative hence, the need for increased efforts to improve the knowledge base of these set of farmers. Most of the farmers had access to family labour as 78% of them were married while the remaining were either widowed or divorced. The mean family size as shown in Table 1 was about 13 which is typical of most traditional farming communities where family labour is critical to farm production system (Oluwasola and

Alimi, 2007). While this is good to meet the labour requirements in the farm, large family sizes could result in high household expenditure that could in turn become a drain on family income, savings and farm capitalization. The mean farm size was 5.4 ha which is far higher than the 2 ha average farm size in Nigeria (NINCID, 2006, Idachaba, 1989) or the 2.2 ha found among cocoa farmers by Idowu et al. (2007) in the same region. This is quite understandable as cocoa grooves with their high density tree foliage requires less efforts to weed once established compared to food crop farms. It is also a major subsector of agriculture that has enjoyed considerable commercialization since the colonial times.

The respondents have been involved in cooperative marketing for an average of 24.5 years and the main benefits derived in the long association include the marketing of cocoa produce enjoyed by all members. Ninety six percent enjoyed the supply of inputs from the societies while 98% enjoyed credit facilities from the relationship. As much as 77% also enjoyed the benefit of transporting their cocoa products to the cooperative offices with the marketing unions vehicles. In terms of distance of farms operated by the respondents to the societies' purchasing offices, most farms were located within 3.1 km.

Table 2 reveals the advantages of buying farm inputs from the cooperative marketing unions as the unit price of inputs purchased by farmers for their cocoa farms were much cheaper compared to what obtained in the open market especially if farmers needed to buy in bulk. The

Table 3. Analysis of cost and returns to cocoa marketing.

Income/cost Items	Amount (N)	Percentage in cost category
Revenue	519,000	
Seedlings	10,230	8.36
Agrochemicals	35,405	28.94
Labour (i).Weeding	32,565	26.61
(ii) Harvesting	16,675	13.63
Transportation	27,486	22.46
Total variable costs	*122,361I*	
Gross margin	387,639	
Fixed costs items	41,105	
Depreciation	10,252	
Total fixed cost	*51,357II*	
Total Cost	173,718	
Net revenue	345,282	
Expense-Structure Ratio	0.41	
Benefit-Cost Ratio	2.99	
Rate of Return	1.99	

price advantage enjoyed by the cooperative organization comes from two main sources. First as a major organization of farmers targeted by the policy on cocoa renaissance, they could receive these inputs at subsidized rates. In addition, it could also buy the inputs in bulk and distribute to farmers as they needed thereby reducing marketing and handling costs.

Analysis of costs and returns to farm enterprise

The breakdown of the cost and return components of the enterprises are presented in Table 3. The table shows that on the average, the farmers spent only N10, 230 (US$63.93) or 8.36% of the total variable cost on seedlings in spite of the efforts of government to access the farmers with subsidized improved seedlings. Although the cooperative marketing unions have passed the benefits of the government assistance to cocoa farmers in terms of supplying subsidized inputs to farmers at cheaper prices as indicated in Table 2, the farmers have not responded maximally to this incentive. The replacement of old cocoa grooves which has been implicated as one of the major factors in the dwindling fortunes of Nigeria in cocoa production (Amos, 2007) by new and improved seedlings is very critical if the cocoa subsector is to be revitalized hence the need for the marketing unions to embark on aggressive drive to ensure members replaced old grooves or planted new farms. The age of the farmer-members of the union which on the average was 64.4 years is however, a major disincentive to this kind of efforts, hence the need to attract younger farmers into the cocoa production subsector. The mean expenditure on agrochemicals was

N35, 405 (US$221.28) or 28.94% of the total variable cost. Labour cost constitute the major variable cost component on the cocoa farms as the farmers spent N32, 565(US$203.53) (26.61%) on weeding and N16, 675 (US$104.22) (13.63%) on harvesting. The two labour driven activities constituted 40.27% of the total variable cost. The gross margin to enterprise was N387, 639 (US$2,422.74) indicating that the enterprise was far able to meet its variable costs. The total variable cost component constitutes 70.44% of the total enterprise cost while the fixed cost components constitute only 29.56%. This is possible because the fixed cost component is recouped over a long period of time and as pointed out earlier, the mean age of the cocoa farms was 20.8 years. The table shows that the net revenue accruing to cocoa farmers was N345, 282 (US$2,158.01). This is equivalent to N28, 773.50 (US$179.83)/month which is far above the national minimum wage of N19, 000.00 (US$118.75) of the nation. The expense-structure ratio of 0.41 indicates that for every N100 spent on cocoa farm business N41 was spent on fixed inputs while the remaining N59 went on variable inputs. The relatively large expenditure incurred on fixed inputs indicates that farmers could find it difficult to adjust to vagaries in market conditions hence adverse market conditions could discourage cocoa farming. This is particularly so as the farmers have very little control of the cocoa export market. The subsidy provided on farm inputs is thus very significant in encouraging farmers to replace old grooves or plant new farms. The benefit-cost ratio of 2.99 indicates that cocoa farming is profitable as every N100 invested returned N199 while the rate of return of 1.99 suggests an increasing return to scale with every N100 invested returning N199. over and above the amount invested (Table 3).

Determinants of cocoa production and marketing

Equation (3) shows the factors determining the output of cocoa in the study area. The result shows that in conformity with *a priori* expectations, family size (X_2), educational level of respondents (X_4), farm size (X_5) and experience of respondents in cooperation (X_7) were positively signed while age of respondents (X_3) and age of cocoa farms (X_6) were negatively signed. Contrary to *a priori* expectations, total cost of production (X_1) was negatively related to cocoa output. All the variables, with the exception of cost of production (X_1) and age of cocoa farms (X_6) were statistically significant determinants of cocoa production. As shown, a unit increase in family size (X_2) would increase cocoa output by 28.7%. This indicates that the family sizes are productive and an increase in the number of family sizes will provide additional family labour that can boost output of cocoa. This is particularly important as labour is the most important variable input in smallholder agriculture (Oluwasola, 2012). On the other hand, a unit increase in the age of farmers (X_3) would decrease output by 14.1%. As indicated earlier, the mean age of farmers was 64.4 years. Clearly the farmers were very old and as they age,

their strength and drive will decrease with a consequent negative effect on output. Furthermore a unit increase in the educational level of respondents (X_4) would increase cocoa output by 43.8%. Increased education will help farmers understand the policy drive of government as well as access the key elements of the policy as related to the inputs. In addition, it will enable the farmers understand the instructions on the usage of these inputs. A unit increase in farm size (X_5) will also increase output by 78.2%, indicating that in smallholder farms where minimal inputs are used, farm sizes tend to be strongly correlated with output and income. Finally, the result also indicated that a unit increase in the years of experience of farmers in cooperative activities (X_7) will increase output by 18.6%. This is important in that cooperative societies provide ready market for farm produce and inputs as well as transportation of produce to cooperative stores. In addition, they also offer opportunities for agricultural extension which could enhance cocoa output. Cost of production (X_1) and age of cocoa farms (X_6) were not statistically significant. The adjusted coefficient of determination of 0.950 indicates that about 95% of the variability in cocoa output is explained by the variables specified in the model.

$$Y_1 = 0.572 - 0.196\ln X_1 + 0.287\ln X_2{}^* - 0.141\ln X_3{}^* + 0.438\ln X_4{}^{**}$$
$$(0.133) \quad (0.194) \quad (0.202) \quad (0.139)$$
$$+ 0.782\ln X_5{}^{**} - 0.09\ln X_6 + 0.186\ln X_7{}^{**} -$$
$$(0.237) \quad (0.114) \quad (0.216)$$

$$\text{(4)}$$

$R2 = 0.967$
$\bar{R}2 = 0.950$
F-value = 56.3

N.B. *significant at 1% level; ** significant at 5% level

Determinants of income from cocoa enterprises

Equation (4) presents the regression analysis of factors affecting income from cocoa farms. As indicated, total cost of production (X_1) and respondents level of education (X_4) were negatively signed contrary to *a priori* expectations. Age of cocoa farms and (X_6) and distance of farm to cooperative offices (X_9) were also negatively signed but in conformity with *a priori* expectations. The remaining variables, family size (X_2), age of farmers (X_3), farm size (X_5), experience of farmers in cooperative activities (X_7) and quantity of cocoa marketed through cooperative societies (X_9) were positively signed. Four of these independent variables were statistically significant. Family size (X_2) was positively and significantly related to

income and as shown, a unit increase in family size will increase cocoa income by 26.3% while a unit increase in farm size (X_5) will also increase income by 42.9%. The result further shows that a unit increase in the years of experience of farmers in cooperative activities (X_7) would increase income by18.7% while a unit increase in the quantity of cocoa products marketed through cooperative societies (X_8) will increase income by 13.4%. Although not statistically significant, there was a negative correlation between total cost of production (X_1), educational level of farmers (X_4), age of cocoa farms (X_6) and distance of farms to cooperative offices (X_9). The adjusted coefficient of determination of 0.734 indicates that about 73.4% of the variability in income derived from cocoa farms is explained by the variables specified in the model.

$$Y_2 = -6.357 - 0.422\ln X_1 + 0.263\ln X_2^{**} + 0.363\ln X_3 - 0.383\ln X_4 + 0.429\ln X_5^{**} - 0.383\ln X_6 + 0.187\ln X_7^{**} + 0.134\ln X_8^{**} - 0.383\ln X_9$$

$$(0.500) \quad (0.690) \quad (0.607) \quad (0.628) \quad (0.207) \quad (0.`391) \quad (0.694) \quad (0.421) \quad (0.578)$$

(5)

R^2 = 0.857

$\bar{R}^2$ = 0.734

``` F-value = 53.8
N.B. *significant at 1% level; ** significant at 5% level

## CONCLUSION AND RECOMMENDATION

In spite of the fact that Nigeria's fortune in cocoa has considerably declined, the study has shown that the enterprise is still very profitable. Although the efforts of government to transform cocoa production through the Cocoa Renaissance Policy is laudable, the farmers involved are very old and very insignificant efforts have been put into developing new cocoa farms since the policy was introduced. There is thus the need to explore strategies that will attract young and educated Nigerians into the sector if the objectives of the policy is to be realized. The use of cooperative societies to target farmers is very important as the inputs obtained through this medium were cheaper than obtained in the open market. The cooperative societies also offer more services including credit and transportation than could be obtained even through public agricultural outlets. They also tend to be closer to the farmers, hence, greater attention should be focused on them to reach more farmers.

The major determinants of output and hence the quantum of cocoa available for sale through cooperative societies were  family size, age of respondents, educational level of respondents, farm size, and experience of respondents in cooperation. Although large family sizes could significantly increase output through the supply of cheap family labour as revealed in this study, the large family expenditure that will be incurred in the process could be a major financial drain that could hinder ploughing back farm income hence, the need for enlightenment campaign among farm households to reduce family sizes. This should be complemented by accessing farmers with farm implements that can substantially reduce labour requirements especially for weeding and harvesting. As farmers age, production will decline hence the need to attract younger, able bodied and educated farmers to the sector. Farm size among the cocoa farmers was above national average and is very significant in determining output. Policy efforts should also focus on increasing the yield of cocoa per hectare to further enhance output.

## Conflict of Interest

The authors have not declared any conflict of interest.

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