AJFAND ONLINE
Volume 9 No. 2 2009
March 2009
ISSN 1684-5374
AFRICAN JOURNAL OF FOOD AGRICULTURE NUTRITION AND DEVELOPMENT

INVESTMENT IN COCOA PRODUCTION IN NIGERIA: A COST AND RETURN ANALYSIS OF THREE COCOA PRODUCTION MANAGEMENT SYSTEMS IN THE CROSS RIVER STATE COCOA BELT

Nkang N M *[1] , EA Ajah[2] , SO Abang[3] and EO Edet[4]

Nkang Nkang

*Corresponding author e-mail: nkangm@yahoo.com

[1] Lecturer, Department of Agricultural Economics and Extension, University of Calabar, P. M. B. 1115, Calabar – Nigeria.

[2] PhD Candidate, Department of Agricultural Economics and Extension, University of Calabar, P. M. B. 1115, Calabar – Nigeria. E-mail: agomajah95@yahoo.com

[3] Professor, Department of Agricultural Economics and Extension, University of Calabar, P. M. B. 1115, Calabar – Nigeria. E-mail: soabang@yahoo.com

[4] Assistant Lecturer, Department of Agricultural Economics and Extension, University of Calabar, P. M. B. 1115, Calabar – Nigeria. E-mail: eyoorok@yahoo.com

ABSTRACT

The study examined costs and returns in cocoa production in Cross River State by comparing three identified management systems of cocoa production in the area. A two-stage sampling procedure was used to select a hundred and fifty cocoa farmers for the study. Data used in the study were collected using structured questionnaires which were administered by the Agricultural Development Programme (ADP) extension agents using the participatory approach while the data were analysed using descriptive statistics such as mean, median, standard deviation, etc. and an investment decision model comprising the net present value (NPV) and benefit-cost ratio (BCR) analysis. Results show that the respondents were predominantly small scale farmers with farm sizes ranging from one to five hectares. The age distribution of the farmers showed that 61.3% of them were among the active farming population falling within the age range of 21 to 40 years, and 16.67% of the respondents had no formal education. More than 50% of the total respondents sourced funds from their personal savings in all the management systems considered. Importantly, the study found that cocoa production is a profitable business irrespective of management system, since all of the management systems had positive net present values (NPV) at 10% discount rate. The NPV for lease-managed farms is highest. The benefit-cost ratio (BCR) at 10% discount rate was greater than one for all the three management systems, which indicates that the returns from cocoa production are high. Owner-managed farms had the highest BCR followed by lease-managed farms and sharecropped farms in that order. Lease-managed farms were more viable compared with other management systems in terms of their high NPVs. The study recommends that given the high benefits relative to costs involved in cocoa production irrespective of management system, investments in cocoa production can be increased by providing expanded access to cheap and flexible credit and land, which have presented as limiting factors in cocoa production based on the descriptive statistical analysis in the study.

Key words: Cocoa, benefit, cost, investment, management

INTRODUCTION

The Nigerian cocoa economy has a rich history which is well documented in literature. The contributions of cocoa to the nation's economic development are vast and have been reported by many authors [1, 2, 3]. In terms of foreign exchange earnings, no single agricultural export commodity has earned more than cocoa. With respect to employment, the cocoa sub-sector still offers quite a sizeable number of people employment, both directly and indirectly [4, 5]. In addition, it is an important source of raw materials, as well as source of revenue to governments of cocoa producing states.

Because of its importance, the recent Federal Government's concern of diversifying the export base of the nation has placed cocoa in the centre-stage as the most important export tree crop. Evidence has however shown that the growth rate of cocoa production has been declining, which has given rise to a fall in the fortunes of the sub-sector among other reasons [6]. Folayan, Daramola and Oguntade (2006), note that cocoa production in Nigeria witnessed a downward trend after 1971 season, when its export declined to 216,000 metric tons in 1976, and 150,000 metric tons in 1986, therefore reducing the country's market share to about 6% and to fifth largest producer to date. In fact, the recent cocoa stakeholders forum held in Calabar, Nigeria by the Presidential Initiative on cocoa was to deliberate on the state of the cocoa sub-sector and reach consensus on how investments in the cocoa sub-sector can be strengthened and increased among other issues that bother on the sub-sector, in view of the Government's renewed interest to boost cocoa production, domestic utilisation and export.

Prior to the Structural Adjustment Programme (SAP), cocoa marketing was carried out by the erstwhile highly regulated Commodity Marketing Boards, which were known to pay farmers far less than the export price of cocoa. This situation affected cocoa production and export in the past as it served as a disincentive to investment in cocoa production. Even after the abolition of the Marketing Boards structure, cocoa production has still not fared better as is evident in the declining production trend reported in previous studies. One of the possible reasons for this may be the nature of investment in cocoa production, as some worry has been expressed as to whether the returns from cocoa are not being threatened by such factors as rising costs of production, price instability, and differences in management systems and perhaps declining productivity due to ageing trees. Generally, if investment in cocoa production were attractive, farmers/investors would allocate scarce resources to cocoa farming. However, the problem is that most individual investors and even governments have only a vague idea of the potential of the industry and as such are sometimes slow in committing investment funds into the sub-sector. Beyond this, information on how the different management systems affect costs and returns has scarcely been documented. Thus, this study empirically investigates costs and returns from different cocoa production/management systems in Cross River State cocoa belt with a view to provide some informed basis for investments in the sub-sector, and particularly a guide as to which management has the highest return, and hence would raise earnings from investment in cocoa for the producers as well as exporters.

From the empirical standpoint, the key questions which need to be addressed are: What are the key socioeconomic characteristics of cocoa farmers in Cross River State? What are the various management systems in operation in the study area? What are the net present values, and benefit-cost ratios of the various management systems? Which of the management systems is more economically viable?

The sequence of this paper is as follows: the section which follows presents the methodology comprising the analytical framework, models specification and the data. Section 3 presents and discusses the results of the empirical exercise, while the last section summarises the study and concludes with policy implications.

METHODS

Analytical Framework

The analytical framework comprises both univariate descriptive statistical techniques and an investment decision model. Cocoa farmers' characteristics (such as age, educational attainment, farm size, sources of funds, etc) were examined using descriptive statistics, while an investment decision model employing the use of the Net Present Value (NPV) and Benefit-Cost Ratio (BCR) was deployed to determine the most economically viable of the three management systems of cocoa production identified in the State, namely, owner-managed, lease-managed, and share-crop managed systems.

The Investment Decision Model

Net Present Value (NPV)

The net present value can be used as an important tool in making a decision by an investor to invest in cocoa production. Benefits and costs are linked to the age of the trees. At the early stages, there are heavy costs which are then followed by annual benefits that continue over the full life of the trees once they have reached maturity.

Thus, following Gotsch and Burger (2001), if we define INC_{it} as the net income (or benefit or return) from *i*-year-old trees as expected in year *t*, then the net present value of the expected net income from one hectare of cocoa in year *t* for one cycle of *I* years duration amounts to:

$$NPV_{I,t} = \sum_{i=0}^{I} \frac{INC_{i,t}}{(1+r)^{i}} \qquad (1)$$

Meanwhile, the expected net income per hectare in year *t* is given as:

$$INC_{t} = \sum_{i=1}^{I} (REV_{i,t} - TC_{i,t}) \qquad (2)$$

Where

$REV_{i,t}$ = the expected revenue per hectare from *i*-year-old trees in year *t*;

$TC_{i,t}$ = the total cost per hectare from *i*-year-old trees in year *t*;

r = the discount rate or the opportunity cost of capital; and

t = the time period.

The formal selection criterion for the net present value is to accept investments with net present value greater than zero. However, if the net present value works out to be negative, then we have a case in which, at the chosen discount rate, the present worth of the income or benefit stream is less than the present value of the cost stream. Hence the revenues are insufficient to allow for the recovery of the investment. An investment is technically and economically feasible if the net present value is positive.

Benefit-Cost Ratio (BCR)

The Investment Decision Model also utilizes the Benefit-Cost Ratio, which is another indicator of the worthiness of an investment decision. It is given as the ratio of the sum of discounted benefits to the sum of discounted costs. Thus, for a cycle of *I* years duration, the benefit-cost ratio can be represented by the formula:

$$BCR_{I,t} = \sum_{i=0}^{I} \frac{DREV_{i,t}}{DTC_{i,t}} \qquad (3)$$

Where:

$DREV_{i,t}$ = discounted revenue (benefits) per hectare from *i*-year-old trees in year *t*;

$DTC_{i,t}$ = discounted total costs per hectare from *i*-year-old trees in year *t*;

The decision rule is that for any project to be economically viable, the ratio must be greater than unity [9].

Sampling Procedure, Data and Implementation Techniques

The study area is Cross River State, Nigeria. A two stage sampling procedure was adopted in this study. The first stage involved the purposive selection of the two Local Government Areas known to be the largest cocoa producing areas in the State and which form the State's cocoa belt, that is Ikom and Etung Local Government Areas. The second stage involved the random selection of 50 farmers apiece from the three management systems of cocoa production (a total of 150 respondents) identified in the study area based on a sampling frame constructed to identify key cocoa farmers in the area. A structured survey instrument was used to obtain the information utilised in the study. The data from the questionnaire was augmented with secondary information from the respondents who kept records, and with data from the Cross River State Ministry of Commerce and Industry, Ministry of Agriculture, Planning, Research and Statistics, the Central Bank of Nigeria (CBN), as well as United Nations Environmental Programme (UNEP).

For the cross-sectional survey of the respondents which took place in 2002, cocoa output was measured in bags of 64kg or 0.064 tons. Average cocoa price at the period was ₦8,864 per bag; that is ₦138,500 per ton; labour cost per man-day was put at ₦200. Age was measured in years and represented how old the farmer was at the time of his study. The per hectare establishment costs, maintenance costs before maturity were obtained from the Ministry of Agriculture. Straight line depreciation method was used to get the actual value of the fixed cost of the assets during the 2002 production season. A discount rate of 10% was used to represent the interest rate or the opportunity cost of capital. The justification for the choice of 10% is because of the *preferred* rates of interest for agricultural investments, which are always lower than the market rates of interest [10].

Since one of the major changes in tree stock occur due to time, that is as the trees grow older, they first become more and later less productive, a time horizon of thirty years which approximates the expected life of a cocoa tree was used in the investment decision analysis checking for differences across the management systems. Thus, the yield profile of cocoa trees in Nigeria with respect to age of tree and year of planting was obtained from UNEP in Nigeria, and used to project the yield of trees thirty years back, based on the observed 2002 yield. Similarly, projections were made for cocoa prices based on 2002 cocoa price in Naira per ton following the growth rate of cocoa producer prices reported for Nigeria by the FAO. This also applied to the per hectare costs of maintenance from maturity obtained from UNEP.

These values were then used in estimating NPV and BCR for the various management systems with the assumption that differences would only be due to how the various systems were run.

RESULTS

Socioeconomic characteristics of cocoa farmers

Age composition and educational level

Table 1 shows a summary of the socioeconomic characteristics of the respondents. On average, the owners are the oldest group of farmers and the lease-managers the youngest, with share-croppers being intermediate. The sharecroppers have the lowest education on average and the lease-managers the highest.

Farm size

The farm size distribution of the respondents reveals that under the three management systems, majority of the plots ranged between 1 and 5 hectares. Moreover, 28% of plots under owner-managers fall within the 6-10 hectare bracket, while it was 10% for lease-managed systems and 4% for sharecrop systems. These results hint that cocoa farm owners reduce risks by leasing out their farms in rather small units than giving out very big units to a single lease manager or sharecropper.

Sources of funds

Results indicate that majority of the respondents in the three management systems funded their production activities from personal savings. Particularly, 6% of the

owner-managers and 12% of the lease-managers obtained bank loans while share croppers did not obtain funds from any formal credit source. On the other hand, more farmers under the sharecropping system obtained funds from relations compared with the other two systems.

Marketing channels

Of the two marketing channels identified, one is from the producer to the licensed buying agent (LBA), the merchant and finally exports, while the other is from the producer to the small-scale buyer, the licensed buying agent, the merchant and then export. Table 1 shows that majority of the respondents from the three management systems taken together market their cocoa through the small scale buyers, who sell to the licensed buying agents, onto the merchants and finally to the export market, while the remainder pass through the licensed buying agent to merchant to the export market. This may be due to the fact that most of the farmers do not produce enough individually to sell directly to the licensed buying or merchants.

Descriptive statistics of costs and returns

Some descriptive statistics of costs and returns for the three management systems are presented in table 2. Lease-managed cocoa farms have a larger mean costs and returns per hectare followed by owner-managed farms. Standard deviations show that costs of owner-managed farms and sharecrop-managed farms are more clustered around the mean than lease-managed farms. Similarly, standard deviations also indicated that returns from the three management systems are widely dispersed from their means. The reason for the above structure, among others, may be the fact that the lease manager is primarily profit-motivated, unlike the sharecropper in this region, whose basic motivation is subsistence: the leaseholder needs a large outlay if he is to earn enough returns to cover lease and other costs and still make profit, whereas a sharecropper is a resource-poor worker, constraint by a lack of cash to own land/other inputs and cannot enjoy size economies beyond the limitations set by the landlord. A look at the sources of funds for the three systems (table 1) indicates the credit worthiness of lease managers: 12% of them have access to bank loans while no sharecropper had such access. The owner managers are just in between the two, combining both profit and subsistence motives at varying degrees.

Investment decision analysis

Owner-managed farms

The benefit cost analysis for cocoa per hectare at 10% discount rate for owner-managed farms for a thirty-year period is shown in table 2. Results indicate positive NPV of ₦57,166.37 per hectare and estimated benefit-cost ratio of 4.27, which is greater than one. These results imply that owner-managed cocoa production systems are viable since they can pay for the factors of production and still make some profit.

Lease-managed farms

The results in table 4 above show that the calculated NPV is positive with a value of ₦6,9408.6 per hectare. This figure is higher than the calculated NPV for owner-managed farms. However, the benefit-cost ratio for leased-managed farms (4.04) is

lower than 4.27 estimated for owner-managed farms. The results imply that lease-managed farms are more viable in terms of NPV than owner-managed farms.

Sharecrop-managed farms

The results indicate that the NPV for sharecrop managed farm is positive and estimated to be ₦28,956.83, while the benefit-cost ratio is 2.71. Although these results imply viability of the sharecrop managed systems in absolute terms, it is quite evident that it is the least viable relative to owner-managed and lease-managed systems. Obviously farmers only choose this option if they do not have the capital to own or lease land.

DISCUSSION

The study examined costs and returns in cocoa production in Cross River State in the context of three identified management systems of cocoa production in the area, namely owner-managed, lease-managed and sharecrop managed systems, using the hundred and fifty randomly selected cocoa farmers. Data were collected using structured questionnaires through the participatory approach using ADP extension agents as well as from secondary sources.

From the study, it can be inferred that majority of the cocoa farmers were in their prime ages. This may be due to the fact that cocoa production activities require physical energy and are labour intensive and thus require the young and energetic to be involved. Another important reason may be that since cocoa production is known to give relatively higher incomes than the other farming endeavours, it is the most likely farming activity that will attract young people. This was confirmed in a study by Amalu and Abang (1997).

Also, farmers' level of education in the study shows that education affects the nature in which farms are managed as well as their overall productivity, hence income. This is in line with economic theory. Accordingly, the viability of the various management systems may have been influenced by the level of education of the farmers. Furthermore, the analysis of farmers' sources of funds points to the fact that it is easier for owner-managers and lease-managers to obtain credit from formal sources than sharecroppers because they can provide what it takes to obtain such loans. Generally, the results show that access to bank loans by farmers is a big problem due to several reasons of which collateral and the risky nature of agricultural production are just but two.

Importantly, the investment analysis results show that cocoa production is a profitable business irrespective of management system, since all of them had positive NPV at 10% discount rate. The NPV for lease-managed farms is highest. The benefit-cost ratio at 10% discount rate was greater than one for the three management systems, which indicates that the returns from cocoa production are high. Owner-managed farms had the highest BCR followed by lease-managed farms in that order. Lease-managed farms were more viable compared with other management systems in terms of their high NPV.

CONCLUSION

The study recommends that given the high benefits relative to costs involved in cocoa production irrespective of management system, investments in cocoa production can be increased tremendously by providing expanded access to cheap and flexible credit and land, which have presented as limiting factors in cocoa production in the State based on the descriptive statistical analysis in the study.

Table 1: Socioeconomic characteristics of cocoa farmers in Cross River State.

Variables	Owner-Managers		Leased- Managers		Sharecrop-Managers	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Age						
21-30	7	14	10	20	10	20
31-40	20	40	20	40	15	30
41-50	15	30	10	20	15	30
Above 50	8	16	10	20	10	20
Total	**50**	**100**	**50**	**100**	**50**	**100**
Educational Level						
No formal education	10	20	4	8	11	22
Primary	13	26	10	20	20	40
Secondary	14	28	26	52	15	30
Tertiary	6	12	7	14	2	4
Others	7	14	3	6	2	4
Total	**50**	**100**	**50**	**100**	**50**	**100**
Farm Size						
1-5	32	64	45	90	43	86
6-10	14	28	5	10	2	4
Above 10	4	8	0	0	5	10
Total	**50**	**100**	**50**	**100**	**50**	**100**
Sources of funds						
Personal Savings	38	76	37	74	39	78
Bank loans	3	6	6	12	0	0
Informal Loans	2	4	3	6	6	12
Others						
Total	**50**	**100**	**50**	**100**	**50**	**100**
Marketing Channels						
P-LBA-M-E	25	50	20	40	21	42
P-S-LBA-M-E	25	50	30	60	29	58
Total	**50**	**100**	**50**	**100**	**50**	**100**

Source: Field survey, 2002

Table 2: Descriptive statistics of costs and returns per hectare for the three management systems.

	Costs			Returns		
Statistic	Owner-managed	Lease-managed	Sharecrop-managed	Owner-managed	Lease-managed	Sharecrop-managed
Mean	3,902.83	7,118.41	3,816.16	21,057.42	26,033.30	12,928.35
Median	2,080	1,840	1,987.5	14,192.03	17,544.56	8,713.11
Standard Deviation	4,362.97	12,979.71	4,350.07	28,954.95	35,798.20	17,776.72
Minimum	575	575	545	0	0	0
Maximum	17,150	51,398.13	17,150	139,355	172,296.19	85,556.14

Source: Compiled from tables III, IV, and V

Table 3: Benefit-cost analysis for owner-managed farms.

Year	yield (kg)	Price (N/ton)	Revenue (N/Ha)	Cost (N/Ha)	Discount Factor (10%)	Discounted Cost (N)	Discounted Revenue (N)
1	0	1000	0	875	0.909	795.38	0
2	0	1453	0	625	0.826	516.25	0
3	0	2356	0	575	0.751	431.83	0
4	0	3259	0	718.33	0.685	492.06	0
5	273.11	4162	1136.67	861.67	0.621	535.1	705.88
6	273.11	5065	1383.29	1005	0.564	566.82	780.18
7	273.11	5968	1629.91	1148.33	0.513	589.09	836.14
8	546.22	6871	3753.05	1291.67	0.467	603.21	1752.67
9	546.22	7775	4246.83	1435	0.424	608.44	1800.65
10	819.3	8678	7110.09	1578.33	0.386	609.24	2744.49
11	819.3	9581	7849.94	1721.67	0.35	602.59	2747.48
12	819.3	10484	8589.78	1865	0.319	594.94	2740.14
13	910.36	11387	10366.26	2008.33	0.29	582.42	3006.22
14	1001.4	12290	12307.14	2151.67	0.263	565.89	3236.78
15	1001.4	13193	13211.4	2295	0.239	548.505	3157.53
16	1092.2	14096	15398.91	2438.33	0.218	531.56	3356.96
17	1092.2	15000	16386.46	2581.67	0.198	511.17	3244.52
18	1092.2	15000	16386.46	2725	0.18	490.5	2949.56
19	1092.2	15000	16386.46	1600	0.164	262.4	2687.38
20	1092.2	15000	16386.46	1850	0.149	275.65	2441.58
21	1051.97	15000	15779.56	2850	0.135	384.75	2130.24
22	1011.5	15000	15172.65	3450	0.122	420.9	1851.06
23	1011.51	20000	20230.2	4850	0.112	543.2	2265.78
24	933.7	30000	28011.05	4993	0.102	509.29	2857.13
25	933.7	40000	37348.06	5145	0.092	473.34	3436.02
26	855.89	50000	42794.66	10500	0.084	882	3594.75
27	855.89	60000	51353.59	11797	0.076	896.57	3902.87
28	855.89	60000	51353.59	12100	0.069	834.9	3543.4
29	778.09	100000	77808.47	12900	0.063	812.7	4901.93
30	700.28	199000	139355	17150	0.057	977.55	7943.23
NPV =	N57,166.37						
BCR =	4.27						

Data analysis

Table 4: Benefit-cost analysis for lease managed farms.

Year	yield (kg)	Price (N/ton)	Revenue (N/Ha)	Cost (N/Ha)	Discount Factor (10%)	Discounted Cost (N)	Discounted Revenue (N)
1	0	1000	0	955	0.909	868.1	0
2	0	1453	0	625	0.826	516.25	0
3	0	2356	0	575	0.751	431.83	0
4	0	3259	0	685	0.685	469.23	0
5	337.64	4162	1405.26	795	0.621	493.7	872.67
6	337.64	5065	1710.15	905	0.564	510.42	964.52
7	337.64	5968	2015.04	1015	0.513	520.7	1033.71
8	675.29	6871	4639.92	1125	0.467	525.4	2166.84
9	675.29	7775	5250.38	1235	0.424	523.64	2226.16
10	1012.89	8678	8789.86	1345	0.386	519.17	3392.89
11	1012.89	9581	9704.5	1455	0.35	509.25	3396.58
12	1012.89	10484	10619.14	1565	0.319	499.24	3387.51
13	1125.44	11387	12815.39	1675	0.29	485.75	3716.46
14	1237.98	12290	15214.77	1785	0.263	469.46	4001.49
15	1237.98	13193	16332.67	1895	0.239	452.91	3903.51
16	1350.48	14096	19036.37	2005	0.218	437.09	4149.93
17	1350.48	15000	20257.2	2115	0.198	418.77	4010.93
18	1350.48	15000	20257.2	2225	0.18	400.5	3646.3
19	1350.48	15000	20257.2	1600	0.164	262.4	3322.18
20	1350.48	15000	20257.2	2216.67	0.149	330.28	3018.32
21	1300.54	15000	19508.1	2833.33	0.135	382.5	2633.59
22	1250.43	15000	18756.45	3450	0.122	420.9	2288.29
23	1250.43	20000	25008.6	4850	0.112	543.2	2800.96
24	1154.28	30000	34628.4	4993	0.102	509.29	3532.1
25	1154.28	40000	46171.2	5145	0.092	473.34	4247.75
26	1058.1	50000	52905	14395.63	0.084	1209.23	4444.02
27	1058.1	60000	63486	23646.25	0.076	1797.12	4824.94
28	1058.1	60000	63486	32896.88	0.069	2269.89	4380.53
29	961.91	100000	96191	42147.5	0.063	2655.29	6060.03
30	865.81	199000	172296.2	51398.13	0.057	2929.69	9820.88
NPV =	N69,408.60						
BCR =	4.04						

Data analysis

Table 5: Benefit-cost analysis for sharecrop-managed farms.

Year	yield (kg)	Price (N/ton)	Revenue (N/Ha)	Cost (N/Ha)	Discount Factor (10%)	Discounted Cost (N)	Discounted Revenue (N)
1	0	1000	0	725	0.909	659.03	0
2	0	1453	0	600	0.826	495.6	0
3	0	2356	0	545	0.751	409.3	0
4	0	3259	0	692.5	0.685	474.36	0
5	167.67	4162	697.85	840	0.621	521.64	433.37
6	167.67	5065	849.26	987.5	0.564	5556.95	478.98
7	167.67	5968	1000.67	1135	0.513	582.26	513.35
8	335.35	6871	2304.16	1282.5	0.467	598.93	1076.04
9	335.35	7775	2607.31	1430	0.424	606.32	1105.5
10	503.02	8678	4365.2	1553.89	0.386	599.8	1684.97
11	503.02	9581	4819.42	1677.78	0.35	587.22	1686.8
12	503.02	10484	5273.65	1801.67	0.319	574.73	1682.29
13	558.91	11387	6364.3	1925.56	0.29	558.41	1845.65
14	614.8	12290	7555.9	2049.44	0.263	539	1987.2
15	614.8	13193	8111.06	2173.33	0.239	519.43	1938.54
16	670.69	14096	9454.07	2297.22	0.218	500.79	2060.97
17	670.69	15000	10060.37	2421.11	0.198	479.38	1991.95
18	670.69	15000	10060.37	2545	0.18	458.1	1810.87
19	670.69	15000	10060.37	1600	0.164	262.4	1649.9
20	670.69	15000	10060.37	1850	0.149	275.65	1499
21	645.85	15000	9687.76	2635.75	0.135	355.83	1307.85
22	621.01	15000	9315.16	3421.5	0.122	417.42	1136.45
23	621.01	20000	12420.21	4207.25	0.112	471.2	1391.06
24	573.24	30000	17197.22	4993	0.102	509.29	1754.12
25	573.24	40000	22929.62	5145	0.092	473.34	2109.53
26	525.47	50000	26273.52	10500	0.084	882	2206.98
27	525.47	60000	31528.23	11300	0.076	858.8	2396.15
28	525.47	60000	31528.23	12100	0.069	834.9	2175.45
29	477.7	100000	47770.04	12900	0.063	812.7	3009.51
30	429.93	199000	85556.14	17150	0.057	977.55	4876.7
NPV =	N28,956.83						
BCR =	2.72						

Source: Data analysis

REFERENCES

1. **Olayide SO** Some Estimates of Supply and Demand Elasticities for Selected Commodities in Nigeria's Foreign Trade. *Journal of Business and Social Studies*. 1969:**1**(9): 176-193.

2. **Olayemi JK** Some Economic Characteristics of Peasant Agriculture in the Cocoa Belt of Western Nigeria. *Bulletin of Rural Economics and Sociology*. 1973; **1**: 24-30.

3. **Folayan JA, Daramola GA and AE Oguntade** Structure and Performance Evaluation of Cocoa Marketing Institutions in South-Western Nigeria: An Economic Analysis. *Journal of Food, Agriculture and Environment*. 2006; **4** (2): 123-128.

4. **Abang SO** Stabilization policy: An Economic Analysis and Evaluation of its Implication for Nigerian Cocoa Farmers. PhD Thesis, Oklahoma State University, Stillwater. 1984: 212.

5. **Folayan JA, Daramola GA and AE Oguntade** Structure and Performance Evaluation of Cocoa Marketing Institutions in South-Western Nigeria: An Economic Analysis. *Journal of Food, Agriculture and Environment*. 2006; **4** (2): 123-128.

6. **Nkang NM, Abang SO, Akpan OE and KJ Offem** Cointegration and Error Correction Modelling of Agricultural Export Trade in Nigeria: The case of Cocoa. *Journal of Agriculture and Social Sciences*; 2006; **2**(4): 249-255.

7. **Folayan JA, Daramola GA and AE Oguntade** Structure and Performance Evaluation of Cocoa Marketing Institutions in South-Western Nigeria: An Economic Analysis. *Journal of Food, Agriculture and Environment*. 2006; **4** (2): 123-128.

8. **Gotsch N and K Burger** Dynamic Supply Response and Welfare Effects of Technological Change on Perennial Crops: The Case of Cocoa in Malaysia. *American Journal of Agricultural Econonomics.* 2001; **83**(2): 272-285.

9. **Gittinger JP** Economic Analysis of Agricultural Projects. The John Hopkins University Press, London. 1989: 299-362.

10. **Federal Ministry of Agriculture, Water Resources, and Rural Development** Agricultural Policy for Nigeria. *Directorate for Social Mobilization, MAMSER, Abuja, Nigeria*. 1988; 1-65.

11. **Amalu UC** and **SO Abang** Survey and Constraint Analysis of Yam-based Cropping Practices in Two Rainforest communities of South-East Nigeria. *Nig. South-East Journal of Agricultural Economics and Extension.*1997; **1**(1): 19 – 22.