International Scholars Journals

Frontiers of Library, Information and Computer Sciences ISSN 5721-610X Vol. 2 (2), pp. 150-154, February, 2016. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

An analysis of the economic system of coagula production in Rubber Research Institute of Nigeria

[1]Ali Sukhera, [1]Ibrahim Wanké and [2]Amina Babangida

[1]Rubber Research Institute of Nigeria, PMB 1049, Benin City, Edo State Nigeria.
[2]Delta State University Abraka, Faculty of Agriculture, Delta State, Nigeria.

Accepted 20 January, 2016

The study was conducted at Rubber Research Institute of Nigeria, Iyanomo, Benin City, Edo State. Data were collected on the production and sales of coagula for the period of eleven years (2001 - 2011) in the Institute for analysis in order to examine the trend movement of the activities. Descriptive statistics were implored for the analysis, and the results indicated that a total of 2,041,954 Kilograms was produced during the period of study; while revenue of ₦ 542,555,720.00 was realized from the sales of this quantity. Fluctuations in the production trend was observed during the period, however, the percentage changes in revenue were positive. This implies that there was stable increase in the price of coagula in the Institute. Recommendations were made for the Institute to expand her rubber plantation size in order to earn more revenue.

Keywords: Coagula, natural rubber, research institute, revenue.

INTRODUCTION

Natural rubber (*Hevea brasiliensis*) is a tropical perennial plant, belonging to the family *Euphorbiaceae*. Rubber plants are mostly grown between 15^0N and 10^0S where the climax vegetation is humid, with temperatures ranging from 23 to 45^0C and well distributed rainfall of 1800 to 2000 mm on a well drained soil (Aigbekaen *et al.,* 2000; Omokhafe and Nasiru, 2005; Umar, Giroh, Betty, Mesike, 2011). The plant is essentially cultivated for its latex content which is converted to many elastic substances such as coagula, rubber smoked sheet, (RSS) etc that is used in the manufacture of many industrial products such as tires, hand grooves, condoms, tubes, shoes, etc. Natural rubber has become increasingly important since the beginning of the 20^{th} century (Kpolo, 1999; RRIS, 2002; Rubber Asia, 2006).

According to Umar and Ugwa (2006), Natural rubber production in Nigeria is believed to have begun around the year 1876 with the exploitation of the local variety, *Funtumia elastica*. *Funtumia elastica* has poor yield (about 340 kg/ha/yr) and bark regeneration after tapping. These qualities posed some challenges to scientists as they discouraged rubber farmers from its production until the discovery of *Knuth Mull Hevea brasiliensis* which arrived Nigeria from Kew garden in England in about 1895 which has better yield (3600kg/ha/yr) and easy/quick bark regeneration after tapping (Ogowewo, 1989).

Rubber Research Institute of Nigeria (RRIN) adapted the exotic clones and tried to improve on their qualities by crossing them with the local clones. The results yielded outputs of about 2000 to 3000 kg per hectare per year which are called NIG 800 and 900 series clones (Omokhafe and Nasiru, 2004). The Institute (RRIN) ventured to develop the new clones base on the fact that there has been an increasing demand for rubber and its products Worldwide, while productivity trend was staggered over the past 40 years and always seems to be inadequate in meeting the growing demands (Umar, et al., 2011).

The high yielding RRIN developed rubber clones boosted the Institute's latex yield and revenue generation. This also renewed rubber farmers' interest to cultivation natural rubber in Nigeria. Currently, the crop ranked sixth in revenue generation among the economic cash crops in the country.

This study therefore is aimed to determine economic

*Corresponding Author's E-mail: ali_sukhera@yahoo.com

Table 1. Production Trends of Coagula in RRIN, Iyanomo Benin City

Production of Coagula in RRIN (KG)												
Months	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**TOTAL**
Jan.	9861	9077	7338	7760	7989	5102	9035	36351	34580	27294	48875	202860
Feb.	8046	10047	4272	6316	4785	3430	4886	38175	28078	20108	50431	178519.9
March	5996	5958	4079	3865	2319	2062	3558	8493	8279	11711	35907	9222.5
April	4617	4753	4824	3683	3526	1903	3391	13598	17324	20041	21383	99040.4
May	5923	4671	5979	3797	3906	3342	4986	20953	24825	21797	46384	145561.7
June	7052	5351	6377	4653	5967	5083	5233	26592	31324	27719	54312	179659.5
July	9876	5441	5127	5091	5695	3840	5606	29622	34841	34462	36631	174228.9
August	12934	5102	5332	4489	8519	5517	5977	28772	34341	28288	51359	190627.4
Sept.	11654	6648	4624	5431	6532	5243	3761	35042	34923	22744	51468	188066.1
Oct.	13003	6892	5611	4717	5511	6178	4627	35144	29236	24483	58027	193427.3
Nov.	11111	7859	5326	5794	8006	7013	7276	35544	31671	21858	76858	218313.8
Dec.	8157	6405	5665	6582	7720	6345	4715	27939	31903	30809	67330	178424.2
TOTAL	108225.5	78203.5	62550.5	62174.5	70472.5	55054	63048	311029.8	341324.5	291309.6	598561.9	2041954

Source: RRIN Tapping Unit (2012)

analysis of coagula production trend and revenue generation between the years 2001 and 2011 in Rubber Research Institute of Nigeria.

METHODOLOGY

The study was carried out at Rubber Research Institute of Nigeria, Iyanomo main station, Benin City, Edo State Nigeria. The Institute has a total land area of 2078 hectares, out of which 496 hectares (24%) is under matured rubber plantation being exploited. There was also a total of 109 hectares of land under immature rubber plantation (5.25%) while the nursery field was 4.2 hectares (0.2%), leaving about 1,964.8 hectares of land for either staff offices/houses or virgin land in the Institute.

Data were collected on the production and sales of coagula for the period of eleven years (2001 - 2011) in the Institute. A time series data approach was adopted in the collection of the data. Descriptive statistics were used in analyzing the yearly and monthly production and sales as well as the percentage changes in coagula production and revenue generated within the time period of study in RRIN in order to examine the trend movement of the activities.

RESULTS AND DISCUSSIONS

Table 1 depicts the monthly production trend of coagula in RRIN from 2001 to 2011. The result revealed a total of 2,041,954 kilograms produced during the eleven years studied. This gives an average of 185,632.18 Kg annually. The Table also shows that there was steady increase in the production of coagula in the Institute with little fluctuations during the period. This implies that given favorable market condition for coagula in Nigeria, there is high tendency for RRIN to produce much higher quantity of coagula. The peak production period was in November which has 202,860 Kg, while the least recorded was in March. The high quantity observed in November may due to the fact that latex flows more during cold weather/harmattan period. As for the least record of yield obtained in March, this may be due fewer tappers that were on duty during the period as a result of general annual leave which most tappers under go, leaving only the casual tappers on duty.

Table 2 shows the revenue generated from sales of coagula during the period of study. There was a steady increase in the revenue generation with little fluctuation as a result of variation in the price of coagula in the international market basically due to macroeconomic influence especially that Nigerian government has abolished Rubber Marketing Board in the country since 1985 (Abolagba, 2008). This risks the rubber industry in the country to experience unregulated affairs, and this can hinders the possibility of making a more realistic prediction of either revenue or production in system using the basic theory of economic principles of production.

Table 3 depicts the percentage changes in the quantity and revenue generated from sales of coagula during the study period. From 2001 to 2006, there was a percentage decline in the production of coagula in the Institute with exception of 2005. But from 2007 to 2011, there was sharp percentage increase in the production also with exception of 2010 which experienced a little decline. On the other hand, the percentage changes in revenue generated during the period showed steady and positive changes. This implies that there was steady increase in the price of coagula in the Institute, and may be due to ever increasing demands for natural rubber worldwide due to technological advancement (Umar and Ugwa, 2006).

Figures 1 and 2 give a more clearer the trend movements in graphical forms for production of coagula and revenue generated in the Institute during the study.

Table 2. Trend of Revenue generated from sales of Coagula from RRIN (₦)

Months	SALES (₦)										TOTAL
	2001	20022003	2004	2005	2006	2007	2008	2009	2010	2011	(₦)
Jan.	359,398	271,164	322,872	411,280	455,373	331,598	3,406,560	10905373	9682473	9552721	**52725085**
Feb.	17106115										**47986315**
March	461,942	221,265	170,860	334,722	272,717	222,918	2,451,916	11452379	7861689	7037640	**11665037**
April	17650761										**25695569**
May	509,377	164,890	163,140	204,819	132,155	133,998	1,706,003	2547968	2318243	4098748	**40901627**
June	12567										**32249310**
July	370,046	126,954	217,058	195,173	211,530	217,240	1,152,786	4079514	4850790	7014206	**39963509**
August	7483926										**51705215**
Sept.	231,012	162,869	269,055	201,241	234,360	365,940	2,424,316	6285954	6950852	7628913	**50600790**
Oct.	16234260										**52058376**
Nov.	425,115	193,916	337,955	246,609	357,990	291,840	2,305,485	7977573	8770728	9701471	**62390491**
Dec.	19009032										**57506296**
	458,461	271,576	271,705	269,797	341,670	291,840	2,822,857	8886615	9755376	12061562	
	12820878										
	614,592	355,671	282,596	237,891	511,140	429,735	3,596,700	8631442	9615564	9900644	
	17975465										
	465,768	320,471	245,046	287,817	391,920	429,885	2,441,500	10512437	9778344	7960266	
	18013719										
	411,831	357,569	297,357	250,001	358,215	505,535	2,453,400	10543397	8186094	8568956	
	20309396										
	578,016	342,219	282,278	307,056	520,390	575,025	5,979,500	10663235	8867726	7650243	
	26900247										
	497,610	251,220	300,245	348,846	501,800	520,290	3,674,100	8381778	8932913	10783020	
	23565491										
Total	**3039784**	**2559514**	**3160167**	**3295252**	**4289260**	**4316865**	**34414123**	**92869715**	**95570793**	**101958390**	**542555720**
	197081857										

Source: RRIN Tapping Unit (2012)

Table 3. Percentage changes in Quantity and Price of Coagula per Year in RRIN

Year	Quantity (Kg)	Price (₦)	%∆ in Quantity	%∆ in Price	% to total Yield(KG)	% to total Value (₦)
2001	108226	3039784	-	-	5.30	0.56
2002	78204	2559514	- 27.74	- 18.76	3.83	0.47
2003	62551	3160167	- 20.02	23.47	3.06	0.58
2004	62175	3295252	- 0.60	4.28	3.05	0.61
2005	70473	4289260	13.35	30.17	3.45	0.79
2006	55054	4316865	- 21.88	0.64	2.70	0.80
2007	63048	34414123	14.52	697.20	3.09	6.34
2008	311030	92869715	393.32	169.86	15.23	17.12
2009	341325	95570793	9.74	29.10	16.72	17.62
2010	291310	101958390	- 14.65	6.68	14.27	18.79
2011	598562	197081857	105.47	93.30	29.31	36.32
Total	**2041954**	**542555720**	**451.51**	**1035.94**	**100.00**	**100.00**

Source: Calculated from Tables 1 and 2

Table4. Percentage changes in Quantity and Price of Coagula per Month in RRIN

Month	Quantity (Kg)	Price (₦)	%Δ in Quantity	%Δ in Price	% to total Yield(KG)	% to total Value (₦)
Jan.	202860	52725085	-	-	11.10	10.03
Feb.	178520	47986315	-1200	- 8.99	9.77	9.13
Mach	9223	11665037	- 94.83	-75.69	0.50	2.22
April	99030	25695569	973.84	120.28	5.42	4.89
May	14562	40901627	- 85.30	59.18	0.80	7.78
Jun.	179660	32249310	133.76	- 21.15	9.83	6.14
July	174229	39963509	- 3.02	23.92	9.54	7.61
August	190627	51705215	9.41	29.38	10.43	9.84
Sept.	188066	50600790	- 1.34	- 2.14	10.29	9.63
Oct.	193427	52058376	2.85	2.88	10.59	9.91
Nov.	218314	62390491	12.87	19.85	11.95	11.87
Dec.	178424	5706296	- 18.27	- 7.83	9.77	10.94
Total	**2041954**	**542555720**	**1917.971**	**139.69**	**100.00**	**100.00**

Source: Calculated from Tables 1 and 2

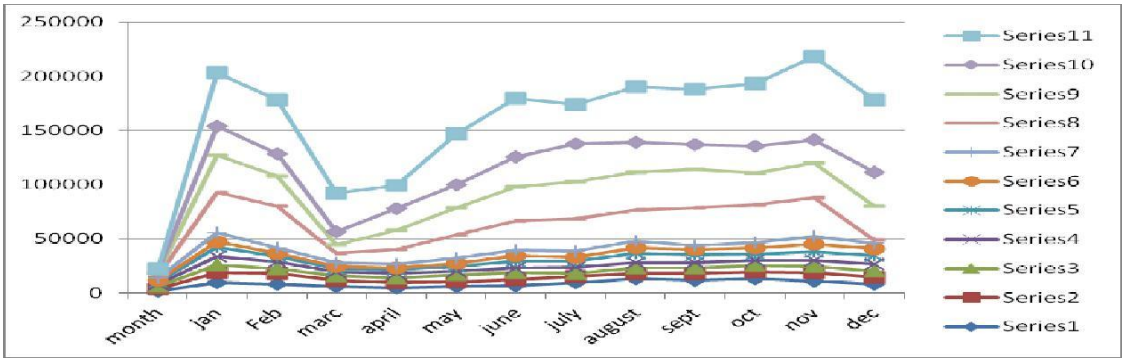

Fig.1: A Graph of Production Trend of Coagula/ Month from 2001 – 2011 in RRIN

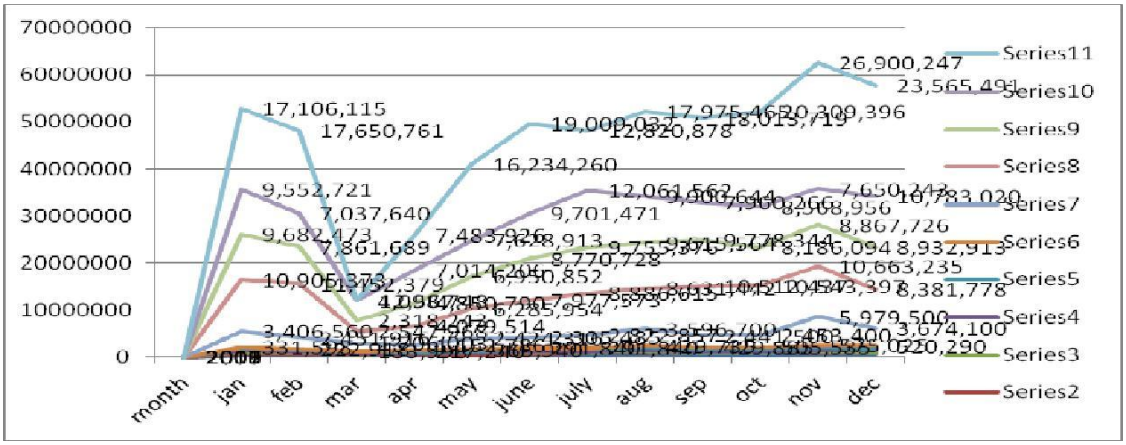

Fig.2: A Graph of Sales Trend of Coagula/ Month from 2001 – 2011 in RRIN

CONCLUSSIONS

The study revealed that RRIN has 2078 ha. of land with only 496 ha. under matured rubber which produces the coagula on the average of 185.632 Kg annually for sale that generated average revenue of ₦ 49,323.25 annually. The study also indicated fluctuation in the production and revenue generated over the period which might be due the influence of macro-economic and the RRIN management.

RECOMMENDATIONS

Previous studies revealed that Natural rubber (NR) has close substitute – the synthetic rubber which was a threat to its development in the 1960s and early 1970s. But on closer observation, NR has no direct substitute and thus its demand continue to increase especially in the current dispensation of technological drive where NR usage has been diversified which include the control of earth quake impact. RRIN thus, base on her mandate, stands a good chance to inculcate the need for farmers to expand their rubber plantation farms in order to earn more revenue. RRIN can also put more of her unused/virgin lands especially that about 70.55% of her land is not under rubber plantation.

REFERENCES

Abolagba EO (2008). The Impact of deregulation in Nigeria on cocoa and rubber. A PhD Thesis in the Department of Agricultural Economics and Extension, Ambrose Alli University, Ekpoma Edo State, Nigeria

Aigbekaen EO, Imarrhiagbe EO, Omokhafe KO (2000). Adoption of some recommended agronomic practices of natural rubber in Nigeria. J. Agric. Fish. 1 51 – 56.

Kpolo DM (1999). Natural Rubber Production in Africa, Rubber International Magazine 1(1); pp 55 – 61.

Ogowewo N (1989). Past and present features of Natural Rubber production. A paper presented at the International Seminar on Applied Agricultural Research and Mechanized farming in tropical areas. Federal Ministry of Science and Technology Lagos, Nigeria. Nov. 10th 1989. Pp 1 – 12.

Omokhafe KO, Nasiru I (2005). Genetic improvement of *Hevea brasiliensis* in Nigeria Proceedings of the International Rubber Conference, India.

Rubber Asia (2006). The complete magazine on rubber. November – December; pp 177.

Rubber Research Institute of Sri – lanka, RRIS (2002). Annual Review, pp 172.

Umar HY, Giroh DY, Agbonkpolor NB Mesike CS (2011). An overview of World Natural Rubber Production and Consumption: An implication for Economic Empowerment and Poverty Alleviation in Nigeria. J. Human Ecol. 33(1): 53 – 59.

Umar HY, Ugwa IK **(**2006). Global Evaluation of natural rubber production (1894 – 2004): The Nigerian experience. Nigeria Journal of Tropical Agriculture .ISSN 1595 –5559. 8(1). Pp 164-175.